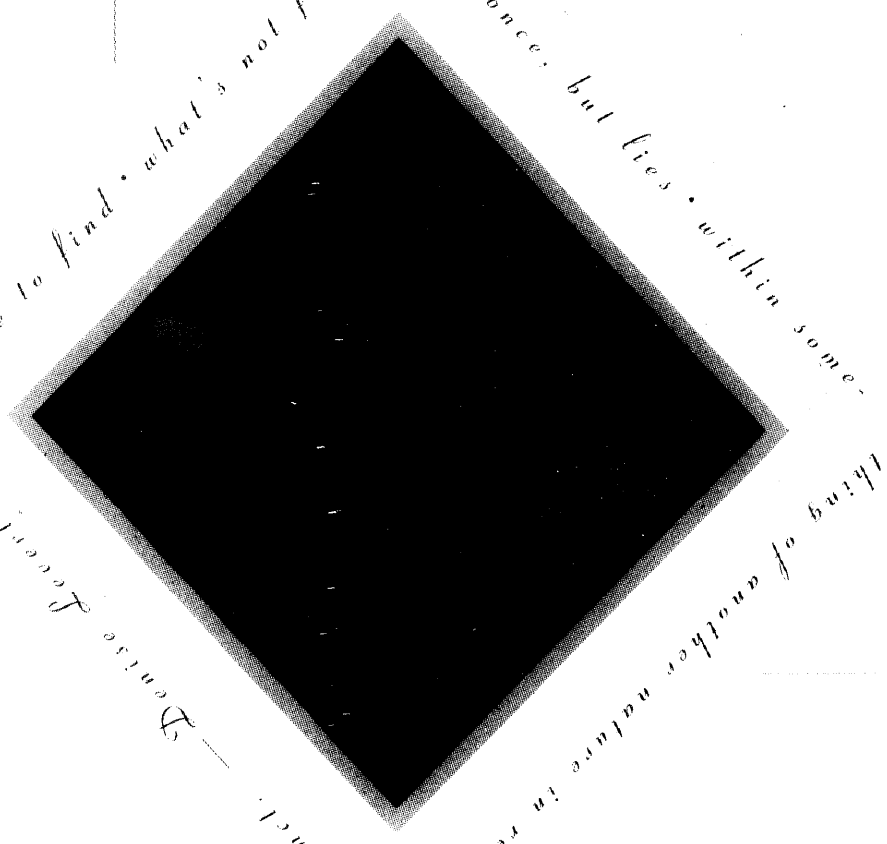
UCSD

GENERAL CATALOG

1996-97



I like to find • what's not found • at once, but lies • within some • thing of another nature in response • distinct • Denise Levertov

UNIVERSITY OF [illegible]IA, SAN DIEGO

Correspondence Directory

Campus Directory Information		(619) 534-2230
UNDERGRADUATE		
Admissions	Registrar & Admissions	Building 301, University Center, 0021A, (619) 534-3160
Educational Opportunity Program (EOP)	Student Outreach and Recruitment Office	Student Center, Building B, 0337, 534-4831
Financial Aids (Loans and Grants)	Student Financial Services	Building 201, University Center, 0013, 534-4480
Foreign Students' Affairs	Office of International Education	International Center, 0018, 534-3730
Housing		
On-Campus	Housing Administration	Trailer 310, University Center, 0041, 534-4010
Off-Campus	Office of Housing Services	Student Center Building B, 0309, 534-3670
Part-Time Employment	Career Services Center	Career Services Center, 0330, 534-4500
On-Campus		
Off-Campus		
Provosts		
Eleanor Roosevelt College	Building 412	University Center, 0069, 534-2235
Muir College	H&SS Building, Room 2126	Muir Campus, 0106, 534-3583
Revelle College	Revelle Provost Building	Revelle Campus, 0321, 534-3262
Thurgood Marshall College	Thurgood Marshall College Admin. Building	Marshall Campus, 0509, 534-4002
Earl Warren College	Literature Building, Room 3210	Warren Campus, 0422, 534-4350
Registration	Registrar & Admissions	Building 301, University Center, 0021R, 534-3150
Residence Status	Registrar & Admissions	Building 301, University Center, 0021R, 534-4586
Scholarships	Student Financial Services	Building 201, University Center, 0013, 534-4480
Student Activities	University Events Office	Price Center, 0078, 534-4090
GRADUATE		
Dean of Graduate Studies and Research	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, 534-3555
Admissions	(Address the appropriate department of instruction.)	
Affirmative Action	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, 534-3871
Fellowships	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, 534-3556
Financial Aids (Loans and Grants)	Student Financial Services	Building 201, University Center, 0013, 534-3807
Graduate Women's Program	Office of Graduate Studies and Research	Building 518, Eleanor Roosevelt College, 0003, 534-355
Housing	Graduate Apartments, Residential Apartments Office	9224 B Regents Road, 0907, 534-2952
Teaching and Research Assistantships	(Address the appropriate department of instruction.)	
SCHOOL OF MEDICINE		
Admissions	Admissions Office	162 Medical Teaching Facility, 0621, 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.

Academic and Administrative Calendar, 1996-1997

Fall Quarter, 1996

Fall quarter begins	Monday, September 23
Instruction begins	Thursday, September 26
Thanksgiving holiday	Thursday–Friday, November 28–29
Instruction ends	Friday, December 6
Final exams	Monday–Saturday, December 9–14
Fall quarter ends	Saturday, December 14
Christmas holidays	Tuesday–Wednesday, December 24–25
New Year holidays	Tuesday–Wednesday, December 31–January 1

Winter Quarter, 1997

Winter quarter begins	Friday, January 3
Instruction begins	Monday, January 6
Martin Luther King, Jr. holiday	Monday, January 20
Presidents' Day holiday	Monday, February 17
Instruction ends	Friday, March 14
Final exams	Monday–Saturday, March 17–22
Winter quarter ends	Saturday, March 22
Academic and administrative holiday	Monday, March 24

Spring Quarter, 1997

Spring quarter begins	Friday, March 28
Instruction begins	Monday, March 31
Memorial Day holiday observance	Monday, May 26
Instruction ends	Friday, June 6
Final exams	Monday–Friday, June 9–13
Spring quarter ends	Friday, June 13
Commencement	Saturday/Sunday, June 14/15
Independence Day holiday	Friday, July 4
Labor Day holiday	Monday, September 1

Catalog Evaluation

Please help us evaluate the effectiveness of the *General Catalog* by answering the following questions:

1. I find the catalog to be visually pleasing. _____ yes _____ no
2. The information in the catalog is clearly presented. _____ yes _____ no
3. The index seems to be complete. _____ yes _____ no
4. The UCSD *General Catalog* attracts me to the institution. _____ yes _____ no
5. Were any catalog sections confusing? If so, which ones?_____
   _____
6. Did you have trouble finding any information you needed? If so, what information was this?_____
   _____
7. Please list any additional information you would like to have included in the catalog, or any additional comments you have.
   _____
   _____

Please check all applicable categories to describe yourself:

_____ I am a potential UCSD applicant.
_____ I have applied or definitely plan to apply to UCSD.
_____ I have been accepted at UCSD.
_____ I am a high school student: _____ freshman _____ sophomore
_____ junior _____ senior
_____ I am a two-year college student, contemplating transfer to UCSD.
_____ I am a four-year college student, contemplating transfer to UCSD.
_____ I am in college, contemplating graduate study in _____ (subject).
_____ I am a UCSD student: _____ freshman _____ sophomore _____ junior
_____ senior _____ medical student
_____ graduate student in _____ (dept.)
_____ I am a junior high school counselor.
_____ I am a senior high school counselor.
_____ I am a community college counselor.
_____ I am a parent of a UCSD applicant or prospective applicant.
_____ I am a UCSD faculty member.
_____ I am a UCSD staff member.
_____ I am a _____ faculty _____ staff member at _____.
_____ I reside in California.
_____ I reside in another state or country.
_____ Other (describe) _____

Please detach this page from the catalog, fold and staple as indicated, and send to address on reverse side.
To express our appreciation for your cooperation, a UCSD decal will be sent to participants in this survey.

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LA JOLLA, CA 92037-9986

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Undergraduate Admission Information and Enrollment Deadlines

	Fall Quarter 1996	Winter Quarter 1997	Spring Quarter 1997
ADMISSION	**Nov. 1, '95**	***July 1, '96**	***Oct. 1, '96**
Opening date for filing application materials			
PRIORITY DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	March 2, '96	March 2, '96	March 2, '96
PRIORITY TELEPHONE ENROLLMENT	May 8–28	Nov. 6–26	Feb. 12–Mar. 4
Students may enroll by telephone.			
Students may use add cards to enroll in restricted courses during or after their priority appointment time.			
Students may pay fees in person at Cashier's Office after enrolling.			
BILLING STATEMENTS MAILED TO ENROLLED STUDENTS	Aug. 15	Dec. 2	March 6
OPEN ENROLLMENT	May 29–Sept. 20	Nov. 27–Dec. 27	March 5–21
Students may enroll by telephone without appointments.			
Students may add, drop, or change grading option and variable units by telephone.			
Students may use add cards to enroll in restricted courses.			
NEW STUDENT ENROLLMENT	June 17–Sept. 20	Dec. 9–13	March 17–21
DEADLINE DAY TO ENROLL WITHOUT LATE FEES	Sept. 13	Dec. 27	March 21
Students who have not enrolled will be assessed $100 in late fees. ($50 late enrollment fee and $50 late payment fee)			
QUARTER BEGINS	**Sept. 23**	**Jan. 3**	**March 28**
LAST DAY FOR STUDENTS WHO MET ENROLLMENT DEADLINE TO PAY REGISTRATION FEES WITHOUT $50 LATE PAYMENT FEE	Sept. 13	Dec. 27	March 21
LAST DAY FOR STUDENTS ON FINANCIAL AID, SCHOLARSHIPS, AND FULL FEE WAIVERS TO NOTIFY THE CAMPUS IF NOT ATTENDING	Sept. 13	Dec. 27	March 21
LATE REGISTRATION PERIOD FOR ALL STUDENTS	Sept. 26–Oct. 11	Jan. 6–17	March 31–Apr. 11
INSTRUCTION BEGINS	**Sept. 26**	**Jan. 6**	**March 31**
ADD/CHANGE/DROP PERIOD	Sept. 26–Oct. 11	Jan. 6–17	March 31–Apr. 11
DEADLINE DAY TO PAY REGISTRATION FEES TO AVOID CANCELLATION OF CLASSES	Oct. 11	Jan. 17	April 11
FINAL DAY TO ADD COURSES	Oct. 11	Jan. 17	April 11
LAST DAY TO APPLY FOR PART-TIME STATUS	Oct. 11	Jan. 17	April 11
CHANGE/DROP PERIOD CONTINUES	Oct. 14–Dec. 2	Jan. 21–Mar. 7	Apr. 14–May 30
Last day to drop without "W"	Oct. 25	Jan. 31	April 25
Last day to change grading option, change variable units	Oct. 25	Jan. 31	April 25
Last day to drop with "W" or final grade must be assigned	Dec. 2	March 7	May 30
INSTRUCTION ENDS	**Dec. 6**	**March 14**	**June 6**
FINAL EXAMINATIONS	Dec. 9–14	March 17–22	June 9–13
FINAL DAY TO FILE "REQUEST TO RECEIVE GRADE INCOMPLETE"	Dec. 16	March 25	June 16
QUARTER ENDS	**Dec. 14**	**March 22**	**June 13**
COMMENCEMENT			June 14/15

*If open–contact Undergraduate Admissions for details, (619) 534-0087. Students applying for winter or spring quarter admission and applying for financial aid should file the FAFSA by November 1, 1996 (winter); February 1, 1997 (spring).

Graduate Admission Information and Enrollment Deadlines

ADMISSION

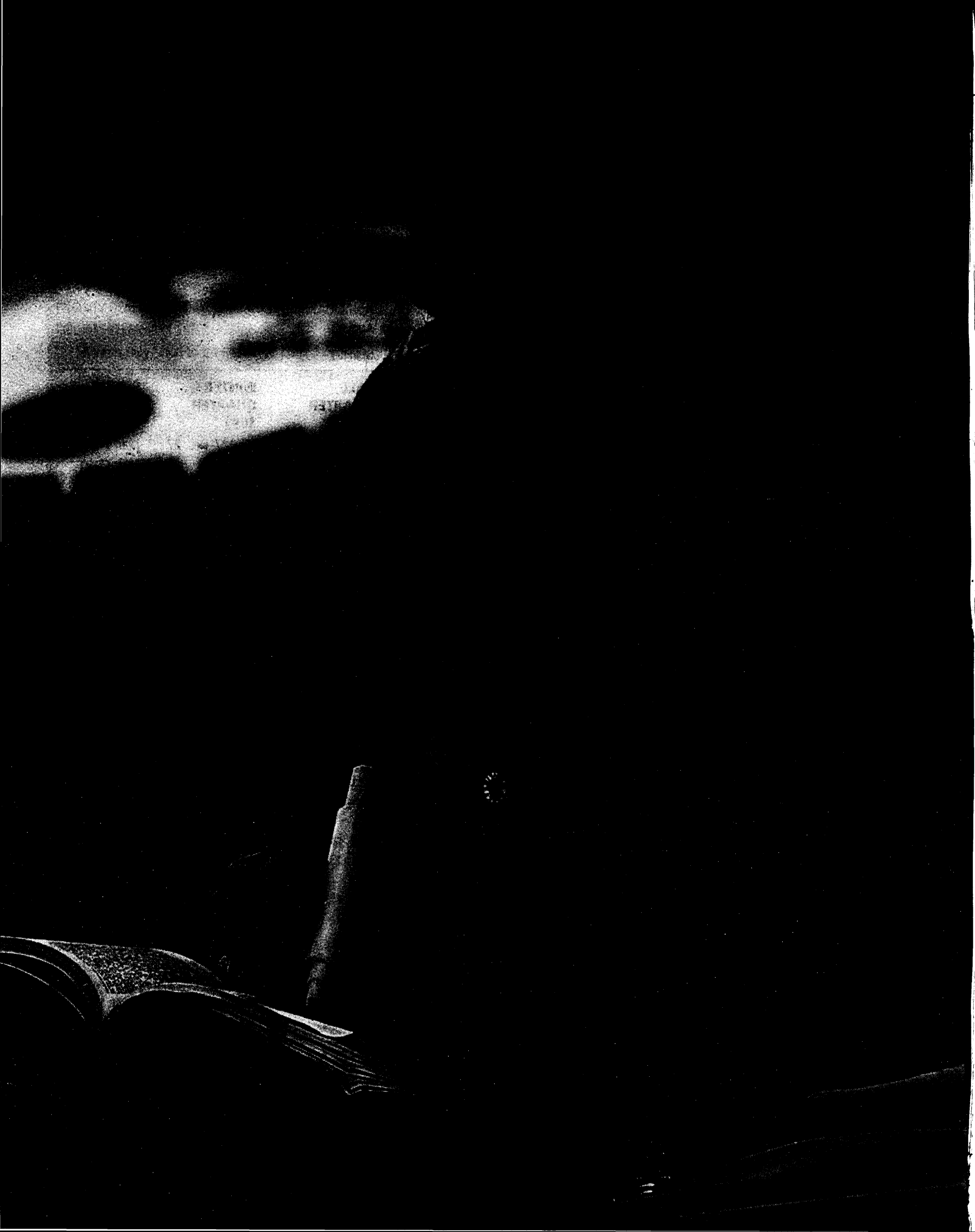
Applicants should check with their prospective departments for deadline dates, although must have January 15, 1997, deadlines.

	FALL QUARTER 1997
APPLICATIONS FOR FELLOWSHIPS	
Deadline date for filing application materials	Jan. 15 '97
Notice of awards	April 1
Acceptance of awards	April 15
DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	March 2

GRADUATE ENROLLMENT DEADLINES

	FALL QUARTER 1996	WINTER QUARTER 1997	SPRING QUARTER 1997
OPEN ENROLLMENT: CONTINUING STUDENTS	May 29–Sept. 13	Nov. 27–Dec. 27	Mar. 5–21
NEW STUDENT ENROLLMENT	June 17–Sept. 20	Dec. 9–13	Mar. 17–21
APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM	Aug. 26	Dec. 6	Feb. 27
FILING APPROVED LEAVE OF ABSENCE	Oct. 14	Jan. 17	April 11
DEADLINE DAY TO ENROLL WITHOUT LATE FEES Students who have not enrolled will be assessed $100. ($50 late enrollment fee and $50 late payment fee)	Sept. 13	Dec. 27	March 21
QUARTER BEGINS	**Sept. 23**	**Jan. 3**	**March 28**
INSTRUCTION BEGINS New and Readmitted Graduate Deadline to enroll and pay registration fees without payment of late fees	**Sept. 21**	**Jan. 8**	**April 1**
LATE REGISTRATION			
Last day for 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. 13	Dec. 27	March 21
DEADLINE FOR CHANGE OF PROGRAM	Oct. 14	Jan. 17	April 11
DEADLINE TO CHANGE GRADING OPTION	Oct. 25	Jan. 31	April 25
DEADLINE FOR DROPPING CLASSES WITHOUT "W" APPEARING ON THE TRANSCRIPT	Oct. 25	Jan. 31	April 25
MASTER'S DEGREE			
Filing for advancement to candidacy with completion in same quarter	Oct. 14	Jan. 17	April 11
Filing approved thesis	Dec. 13	March 21	June 13
DOCTOR OF PHILOSOPHY DEGREE			
Filing draft dissertation with doctoral committee	Nov. 15	Feb. 21	May 16
Filing approved dissertation and related materials	Dec. 13	March 21	June 6
DROPPING CLASSES WITHOUT PENALTY OF "F" GRADE	Dec. 2	March 7	June 6
INSTRUCTION ENDS	**Dec. 6**	**March 14**	**June 6**
FINAL EXAMINATIONS	Dec. 9–14	March 17–22	June 9–13
REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 13	March 21	June 13
QUARTER ENDS	**Dec. 14**	**March 22**	**June 13**
COMMENCEMENT			June 15
COMPLETION OF REQUIREMENTS			
Final date for completion of all requirements for degrees to be awarded at end of quarter	Dec. 13	March 21	June 13

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



Introduction

History

UCSD, one of the newest of the nine campuses which make up the University of California system, celebrated its twenty-fifth anniversary during the 1985–86 academic year. The other campuses of the University of California are located in Berkeley, Davis, San Francisco, Santa Cruz, Santa Barbara, Riverside, Los Angeles, and Irvine. Each campus 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 nine-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., and Ph.D. 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, approved by the Regents in 1986, is the only school of international affairs in the UC-system. 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. When, in the late 1950s, 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 history of its growth may help to explain how, in some three decades, UCSD has been able to match institutions which were founded a century or more ago.

The faculty of UCSD now includes five Nobel laureates (four of whom hold joint appointments with the nearby Salk Institute); one winner of the Fields Medal in mathematics; four recipients of the National Medal of Science; one winner of the Pulitzer Prize; fifty-one members of the National Academy of Sciences; sixty-seven Fellows of the American Academy of Arts and Sciences; twelve Fellows of the American Philosophical Society; five fellows of the Econometric Society; thirteen members of the National Academy of Engineering; six members of the International Academy of Astronautics; ten 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 240 four-year institutions selected for this distinction since the society was founded in 1776, and more than 200 current faculty and staff are members.

In addition, UCSD is officially accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges.

University and Community

There are certain facts about UCSD which you should 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, with opportunities to serve at local television stations, in charity organizations, and in local, state, and federal government agencies as well as in a diverse array of local businesses.
- 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. An example is UCSD's PASCAL program, which was developed by a group of undergraduate students in UCSD's computer laboratories. PASCAL is credited by leaders in the microcomputer field with revolutionizing the writing of computer programs. 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-wide level as well as within the five separate colleges.
- UCSD fields twenty-three men's and women's intercollegiate athletic teams. Campus athletic facilities include a new Recreational and Intramural Athletic Center (RIMAC), two gymnasiums, two swimming pools (one twenty-five yard, one fifty-meter), 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.

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 the regular school year.

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. For free copies write to Summer Session Office, Mail Code 0179, University of California, San Diego, La Jolla, CA 92093-0179, or call (619) 534-4364.

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 Department 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, which is part of UCSD.
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.
8. UCSD does not have an ROTC program. Students may, however, with the permision 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 and USMC 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.

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 thus gain a sense of belonging through affiliation with one of the campus's semiautonomous colleges.

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

Each college is designed to accommodate up to 2,500–3,000 students. Each has its own residence halls, commons (which include dining facilities and meeting rooms), and classrooms. 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, 1,200-acre site high on the bluffs overlooking the Pacific Ocean 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 parties 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 southward to the open-air markets of Tijuana and 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 Jack Murphy Stadium, home of the Padres and the Chargers.

There are numerous theaters in San Diego, including the Old Globe Theatre in Balboa Park, site of the National Shakespeare Festival every summer. 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 presents plays in both the 500-seat Mandell Weiss Theatre and the new 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 year-round. The San Diego metropolitan area enjoys the most comfortable climate in the United States, twelve months of the year.

Fishing opportunities are plentiful offshore in kelp beds west of La Jolla and surrounding the Coronado Islands in Mexican waters. Bass and trout fishing are available in nearby lakes. An hour's drive to the east, the Laguna Mountains provide pleasure at 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. The peninsula—a mecca for lovers of unspoiled beaches and untouched mountains and deserts—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 many intercollegiate athletic teams along with several club sports teams, while the intramural program provides for student competition in twenty sports in three categories of play: men, women, and coed.

Intramural sports are highly popular with UCSD students. An estimated 60 percent of all students take part in one or more of the more than 1,500 teams involved in various sports during the course of the academic year.

Need More Information? Check the Following:

- ☐ How do I apply for admission? See page 39. (See also "Note," below.)
- ☐ How much does a UCSD education cost? See "Fees and Expenses," page 52.
- ☐ What's the grading system at UCSD? See page 68.
- ☐ How should I decide which college to choose at UCSD? See page 15.
- ☐ What services and facilities are available to students at UCSD? See page 99.
- ☐ Where do I write for more information? See inside front cover.

NOTE: An admissions packet for students interested in applying to UCSD can be obtained from any California high school or junior college counselor's office. Out-of-state students may request a packet by writing to the Office of Admissions on any University of California campus.

Major Fields of Study

UCSD offers a wide variety of nationally recognized majors in a broad array of fields, summarized in the list below. (For a listing of graduate programs, refer to the section of this catalog titled "Graduate Studies.") New programs with strong emphasis on fundamentals have also been developed. Increasing numbers of qualified students are being attracted to these innovative programs.

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

UCSD has limited the number of its academic departments. For example, there is only one Department of Literature, and the major subareas of biology are not fragmented into separate departments. This system has proved especially valuable to undergraduates who choose to avoid overspecialization early in their studies.

A number of special, individually oriented programs utilize the combined resources of two or more departments. Among these are Chinese Studies, Classical Studies, Earth Sciences, Human Development, Italian Studies, Judaic Studies, Religious Studies, Russian and Soviet Studies, the Teacher Education Program, Third World Studies, Urban Studies and Planning, and Women's Studies.

Engineering students may choose from a number of majors in the Department of Applied Mechanics and Engineering Sciences (AMES), the Department of Bioengineering (BE), the Department of Computer Science and Engineering (CSE), or the Department of Electrical and Computer Engineering (ECE). All four departments seek to educate the engineer of tomorrow, with increased emphasis on computer methods and systems science.

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. However, more and more 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 upon a major, many UCSD professionals are available to aid you. Among them are the academic advisers in the provosts' offices of the various colleges, faculty members, and departmental advisers (who can help you to select an appropriate curriculum). Additional specialists in the Career Services Center and in Psychological and Counseling Services are available to help you appraise your personal aptitudes.

Undergraduate Departments

ARTS
- Music
- Theatre
- Visual Arts

SCHOOL OF ENGINEERING
- AMES (Applied Mechanics and Engineering Sciences)
- BE (Bioengineering)
- CSE (Computer Science and Engineering)
- ECE (Electrical and Computer Engineering)

HUMANITIES
- History
- Literature
- Philosophy

SCIENCE AND MATHEMATICS
- Biology
- 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.

APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)
- Aerospace Engineering ..... B.S.
- Chemical Engineering ..... B.S.
- Engineering Sciences ..... B.S.
- Mechanical Engineering ..... B.S.
- Structural Engineering ..... B.S.

BIOENGINEERING (BE)
- Bioengineering ..... B.S.
- Bioengineering: Premedical ..... B.A./B.S.

BIOLOGY
- General Biology ..... B.S.
- Animal Physiology and Neuroscience ..... B.S.
- Biochemistry and Cell Biology ..... B.S.
- Ecology, Behavior, and Evolution ..... B.S.
- Microbiology ..... B.S.
- Molecular Biology ..... B.S.

CHEMICAL ENGINEERING (see AMES)

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.
- Pharmacological Chemistry ..... B.S.

COGNITIVE SCIENCE
- Cognitive Science ..... B.A./B.S.

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

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

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

EDUCATION (see Footnote 1)

ELECTRICAL AND COMPUTER ENGINEERING (ECE)
- Applied Physics ..... B.A.
- Computer Engineering ..... B.S.
- Electrical Engineering ..... B.S.
- Engineering Physics ..... B.S.
- Information Science ..... B.A.

ENGINEERING (see AMES, BE, CSE, and ECE)

ENGLISH (see Literature)

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

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

LINGUISTICS
- Linguistics ..... B.A.

LITERATURE
- Literatures in English ..... B.A.
- French Literature ..... B.A.
- General Literature ..... B.A.
- German Literature ..... B.A.
- Italian Literature ..... B.A.
- Russian Literature ..... B.A.
- Spanish Literature ..... B.A.
- Literature/Writing ..... B.A.

MATHEMATICS
- Mathematics ..... B.A.
- Applied Mathematics ..... B.A.
- Applied Mathematics (Scientific Programming) ..... B.A.
- Mathematics–Computer Science ..... B.A.

MUSIC
- 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/Biophysics (Pre-medical) ..... B.S.
- Physics with Specialization in Earth Sciences ..... B.S.

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

PRELAW (see Footnote 2)

PREMEDICAL (see Footnote 3)

PSYCHOLOGY
- Psychology ..... B.A.

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

TEACHER EDUCATION (see Footnote 1)

THEATRE
- Theatre ..... B.A.

VISUAL ARTS
- Art History/Criticism ..... B.A.
- Media ..... B.A.
- Studio ..... B.A.

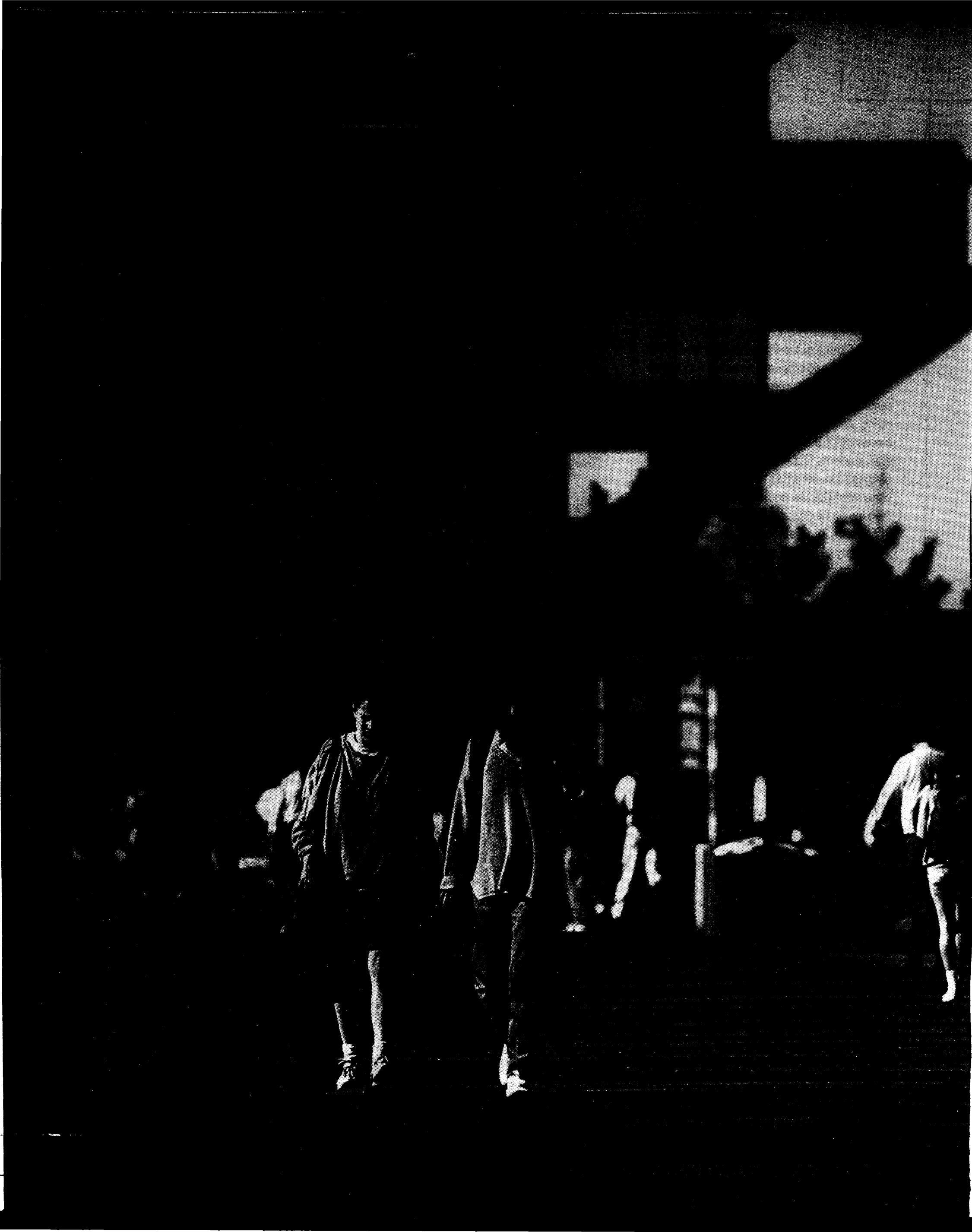
INTERDISCIPLINARY MAJORS (see Footnote 4)
- Chinese Studies ..... B.A.
- Classical Studies ..... B.A.
- College Special Individual Majors ..... B.A.
- Earth Sciences ..... B.S.
- Human Development ..... B.A.
- Italian Studies ..... B.A.
- Judaic Studies ..... B.A.
- Religious Studies ..... B.A.
- Russian and Soviet Studies ..... B.A.
- Third World Studies ..... B.A.
- Urban Studies and Planning ..... B.A.
- Women's Studies ..... 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 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 staff includes professional premedical advisers.

Footnote 4: Interdisciplinary majors usually consist of a prescribed collection of courses from two or more departments. Students interested in such majors should consult the "Courses, Curricula, and Programs of Instruction" section at the back of this catalog.



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 small colleges: Revelle, John Muir, Thurgood Marshall, Earl Warren, and Eleanor Roosevelt.

The division of UCSD's campus community into small undergraduate colleges was purposeful, and not a chance event. Planners of the new campus examined the various alternatives available and decided upon the small-college concept which has served Oxford and Cambridge so successfully for centuries. The planners were convinced that many–if not most–students learn more, and find greater fulfillment in their personal lives, when they are joined academically and socially with a relatively small group of fellow students and faculty. But the planners also understood that there are many advantages to "bigness" in a university: a faculty of international renown, first-rank teaching and research facilities, laboratories, libraries, and other amenities of size.

These planners wisely determined, therefore, to create an arrangement which would combine the best aspects of a large research university with the finest features of a small liberal arts college. The answer was–and is–the UCSD collegiate system, a series of semiautonomous undergraduate colleges, each with its own faculty, residential and academic facilities, and distinctive educational philosophy. The system was inaugurated with the opening of Revelle in 1964. In the intervening years, four more colleges–John Muir, Thurgood Marshall, Earl Warren, and Eleanor Roosevelt–have been established. The separate college structure may be found today on many American university campuses. In most cases, however, these colleges are designed to serve specific disciplines–engineering, agriculture, and business administration, as examples. This is not the case at UCSD. Instead, at UCSD any undergraduate may select a major from the full range of majors available. The choice of a college is based, therefore, not on one's major, but upon one's preferences in terms of the various educational philosophies and environments offered by the various colleges.

UCSD's college system allows undergraduates to choose among *five* 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 select a college 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 one academic discipline and a basic understanding of another unrelated academic field.

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 excellence and student leadership. Its structured and well-rounded curriculum has been acclaimed nationally. Individual academic advising, honors programs at all levels, and programs that foster student-faculty interaction, are all hallmakrs of UCSD's first college.

John Muir College Educational Philosophy

The faculty of 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 the humanities, fine arts, or foreign languages. Many choices are available for each of the four year-long sequences. Effective fall 1993 Muir has a U.S. cultural diversity graduate requirement. Students also complete two expository writing courses. Muir's requirements accommodate a wide range of interests and aptitudes. The relative openness and flexibility of its curriculum makes 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, fostering independence and responsibility, has helped to make Muir the largest of UCSD's colleges.

Thurgood Marshall College Educational Philosophy

Thurgood Marshall College is a liberal arts and sciences college dedicated to the development of the scholar and citizen. Students pursue majors in the social sciences, natural and physical sciences, mathematics, engineering, humanities, and fine arts.

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 and the variety of ways culture enables people to fashion lives of

dignity. Therefore, the distinctive general-education requirements have a rich tradition of emphasizing a critical examination of the human condition in a multicultural society.

The three-quarter core sequence, "Dimensions of Culture – Diversity, Justice and Imagination" is designed as an interdisciplinary, issues-oriented curricular experience that seeks to balance an exploration of uniquely American, Western, and non-Western culture. Students also are required to complete courses in mathematics, natural/physical sciences, writing, humanities, and fine arts.

In addition to the strong academic program, Thurgood Marshall College is proud of its emphasis on the student as citizen. The Student Leadership Program is especially designed to encourage active participation in the governance of the college and in community public service.

Earl Warren College Educational Philosophy

Earl Warren College emphasizes curricula and programs that assist students in making a close connection between their undergraduate education and their personal and professional goals for their postbaccalaureate years. This approach applies to all students, whether their career aspirations lie in the professions, the arts, or the sciences. As a means of supplementing curricular requirements, the college encourages students to take advantage of academic internships and career-life planning programs to sharpen their skills and test their career choices.

Each student enrolled at Earl Warren College has the opportunity to develop an educational program best suited to his or her individual interests, but within a sound framework that ensures significant exposure in three disciplinary areas: humanities/arts, social sciences, and natural sciences. All students are required to take two focused collections of courses outside the general area of their major which, in the majority of cases, will include upper-division work, as well as introductory courses.

In addition, Warren College stresses the importance of the following attributes: student leadership development, an appreciation of diverse cultures, the importance of individual responsibility, and awareness of ethical issues and their application in contemporary society.

Eleanor Roosevelt College Educational Philosophy

Eleanor Roosevelt College faculty believe that to be truly educated in today's world, students must learn about their own cultural heritage as well as the cultures of other major countries in the world. Therefore, the general-education requirements of the college have an international orientation designed to instill in students, regardless of major, a global perspective.

The centerpiece of the general-education curriculum, a six-quarter sequence entitled "The Making of the Modern World," encourages students to think historically, across cultures and across disciplines, about both Western and non-Western cultures. In addition, students complete course work in at least one foreign language, as well as a two-quarter fine arts requirement designed to ensure familiarity with both Western and non-Western music, visual arts, or theatre. Each student also completes a three-course regional specialization designed to foster learning in greater depth about a single geographic area. Students who wish to complete a minor may combine foreign language course work with a related regional specialization to form a minor in, for example, Asian or Middle Eastern studies. To round out their general education, students complete two courses in math or computer science and two courses in natural sciences. Although travel abroad is not required, all students in Eleanor Roosevelt College are encouraged and helped to find a way to study, work, or travel in another country as part of their education.

Its international focus does not mean that Eleanor Roosevelt College students are restricted in their choice of major. In fact, they may select any major offered at UCSD. The difference is that its general-education requirements help all its undergraduates, regardless of major, to understand the forces past and present that make all nations increasingly dependent on the global community today. This broad international background also makes Eleanor Roosevelt College graduates attractive to graduate schools, professional schools, and the business world.

College Administration

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

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 have primary responsibility for providing 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.

The academic advising offices conduct academic orientation/registration programs for all new students and advise 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 gives information about prerequisites and screening criteria for majors. 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.

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.")

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 non-contiguous to the major.

JOHN MUIR COLLEGE

WRITING **2-3**

A Three-Course Sequence **6**
in each of TWO of the following categories:

HUMANITIES

FINE ARTS

FOREIGN LANGUAGE

AND
A Three-Course Sequence **3**
IN EITHER
MATHEMATICAL SCIENCE

OR
NATURAL SCIENCE
(Sequences are available for science and non-science majors.)

AND
A Three-Course Sequence **3**
IN **SOCIAL SCIENCES**

THURGOOD MARSHALL COLLEGE

DIMENSIONS of CULTURE . **3**
(DIVERSITY, JUSTICE and IMAGINATION)
Includes two six-unit courses with intensive instruction in university-level writing

HUMANITIES and CULTURE **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**

DISCIPLINARY BREADTH **4**
Must be noncontiguous to the major field of study. Two of these courses must be upper-division. At least one course must include significant writing.

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

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 non-contiguous 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 **2-3**
One quarter may be waived for students who are biliterate.

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.

MINOR/ADDITIONAL GRADUATION REQUIREMENTS

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 non-contiguous 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.

TOTAL 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 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 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.*

Whatever the question or the problem, 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. Approximately 14 percent of graduating seniors are eligible for college honors. 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 any of the undergraduate colleges must complete the requirements of the chosen college. Students should also complete major prerequisites, especially for science and engineering majors. In preparation for the New Student Orientation Program, the College Academic Advising staff will evaluate the transfer course work to determine which courses are applicable to general-education requirements. Since a variety of general-education options are available, students are encouraged to carefully choose 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.

Formerly called the School of Science and Engineering and later First College, 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 should enable 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 fields 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, chosen from an approved list, 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 or completion of the fourth quarter of foreign language instruction with a passing grade.
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, music, or visual arts. (See "Courses, Curricula, and Programs of Instruction: Theatre, Music, and Visual Arts.")

4. SOCIAL SCIENCES

Three lower-division courses offered by the Departments of Anthropology, Cognitive Science, Cultural Traditions (Women's Studies), Economics, Ethnic Studies, History, Linguistics, Political Science, Psychology, Sociology, or Urban Studies and Planning, *from an approved list available at the Provost's Office.* Effective for transfer students entering fall 1994 (TAG students exempt), at least one of these courses must be from a list approved as meeting the requirement in American Cultures.

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), 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-11B (for non-science majors). The Department of Biology offers Biology 1 or 3 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 Vietnamese, 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. 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 taking the courses. The area of focus is not posted to the degree or transcript.

These three courses may not be used on any other requirements. They may be upper-division or lower-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
Foreign Language	Elective	Elective

*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.

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.

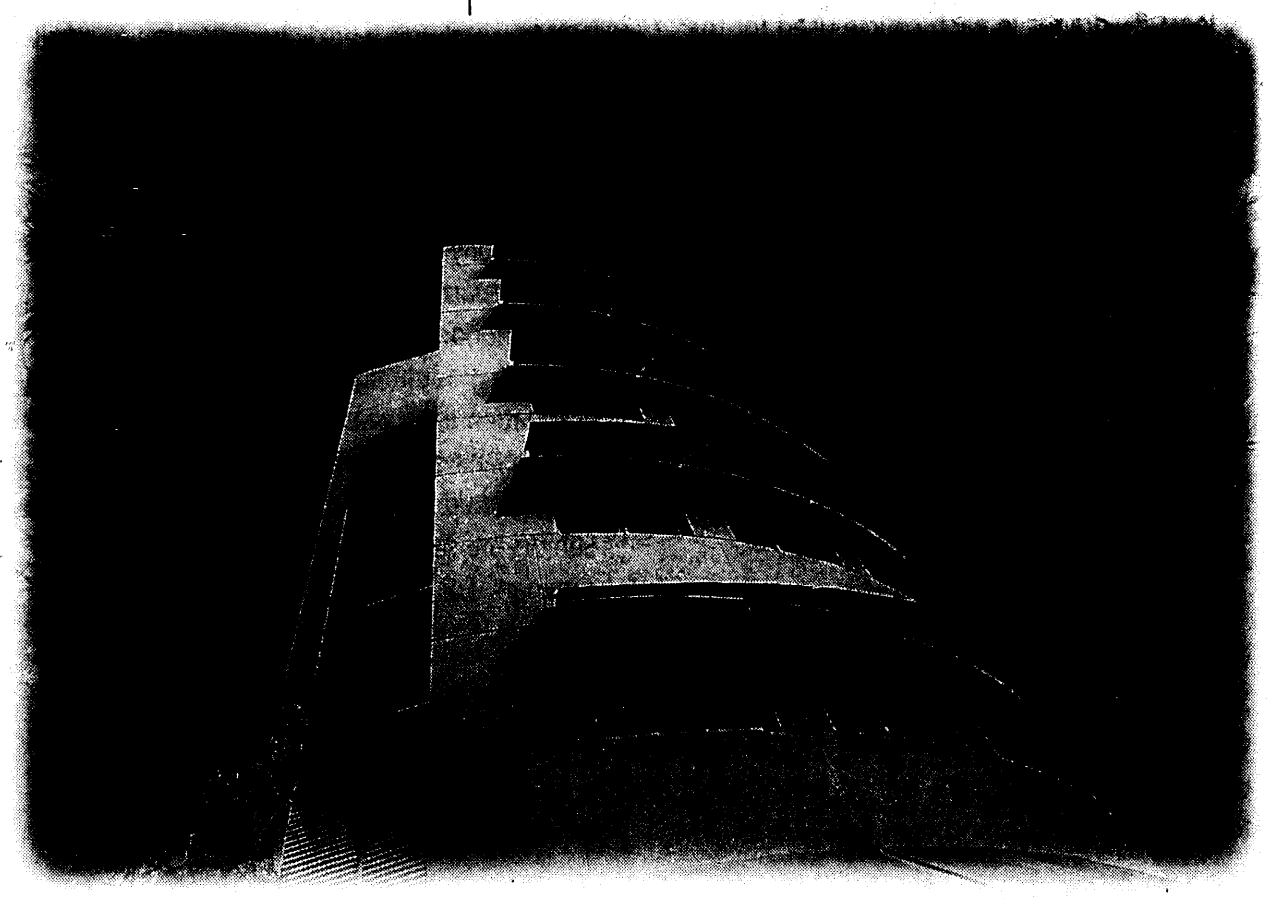
Students who fail to attain a grade-point average of at least 2.0 in work taken in the prerequisites for the major, or in the courses in the major, may, at the option of the department, be denied the privilege of entering or of continuing in that major. Students majoring in AMES, bioengineering, CSE, 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.

The minor guidelines of the college are as follows:

1. Department Minor—All six 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.)



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 or the optional minor may be taken on a Pass/Not Pass basis unless otherwise stipulated by the department or program.
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. Social Science and Humanities majors may take courses only from the Chemistry 6 sequence, the Physics 1, 2, or 4 sequence, and Biology 1 or 3 for a Pass/Not pass grading option.
5. Upper-division courses to be counted toward a departmental major may not be taken on a Pass/Not Pass basis. Individual departments and/or advisers 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 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.")

Upon satisfaction of the graduation requirements, Revelle College will recommend that the student be awarded the bachelor of science degree in biology, physics, cognitive science, chemistry, earth sciences, and in designated engineering programs, or the bachelor of arts degree in all other majors.

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 fourteen graded units during their first quarter. The program includes weekly participation in small faculty seminars, and a variety of other perquisites. Outstanding students are individually advised to join honors classes in mathematics and social science.

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 one 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.

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 such areas as contemporary issues 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

The general-education program was established by the faculty of John Muir College to guide students toward a broad and liberal education while allowing them substantial choice in the development of that education. In addition to two expository-writing courses, students must select year-long sequences (three courses in the same department) from four different academic areas. One of the sequences must be from the social sciences area, the second from the natural sciences or mathematics (calculus), and the remaining two sequences from the humanities, fine arts, or foreign languages. Students choose sequences from several alternatives.

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

1. Students should request from the Academic Advising unit of the Office of the Provost a list of general-education requirements before making their final selection of courses.
2. Only complete sequences 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 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; such 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 standing (2.0 GPA). No more than one-fourth 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 with the exception of all major-related courses and most minor courses. It is advised that students check with their major or minor department regarding restrictions or exceptions.

Major Programs and Special Projects

Almost all of the major programs at UCSD have a pattern of prerequisites, some of them quite extensive. Students must declare a major upon accumulating ninety units. Students who do not plan well could find, in their junior year, that they have access to few majors without doing additional lower-division work. With careful planning, they may have access to a wide range of majors. Muir College students are encouraged to consult regularly with the academic advisers of the Office of the Provost as well as with their major department advisers concerning the selection of appropriate courses so as to graduate by the 200 maximum unit 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., 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.
3. The physical and life sciences, applied sciences (the Departments of Computer Science and Engineering, Electrical and Computer Engineering, Bioengineering, and Applied Mechanics and Engineering Sciences) together with certain social sciences (including 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. 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 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 obtaining, completing, and returning the Degree and Diploma Application packet to the Academic Advising Office. 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.**
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. 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). (*Please note that departments that grant B.S. degrees may require a minimum of 192 units and more than eighteen upper division courses.)
8. Show some form of concentration and focus of study. Ordinarily this is accomplished by completing a department major. Students in the college may attempt any major upon completion of the prerequisites. (Presently, the Departments of AMES, Bioengineering, CSE, ECE, Mathematics-Computer Science and Literature/Writing require students to attain a minimum GPA in prerequisite courses and apply for admission to majors in the departments.) Students who do not choose to meet this requirement by means of a departmental or interdisciplinary major may propose a special project major. As the name implies, this is a specialized form of concentration. It normally consists of a combination of regular course work, independent study, and a senior thesis or project. Each proposal and senior thesis or project must be approved by the provost. (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 the major. 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 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.** At least three of the six courses must be upper-division. Only one of the lower-division classes may be taken P/NP. Among upper-division classes, only a 198 or 199 may be taken P/NP.

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 72 must be upper-division).

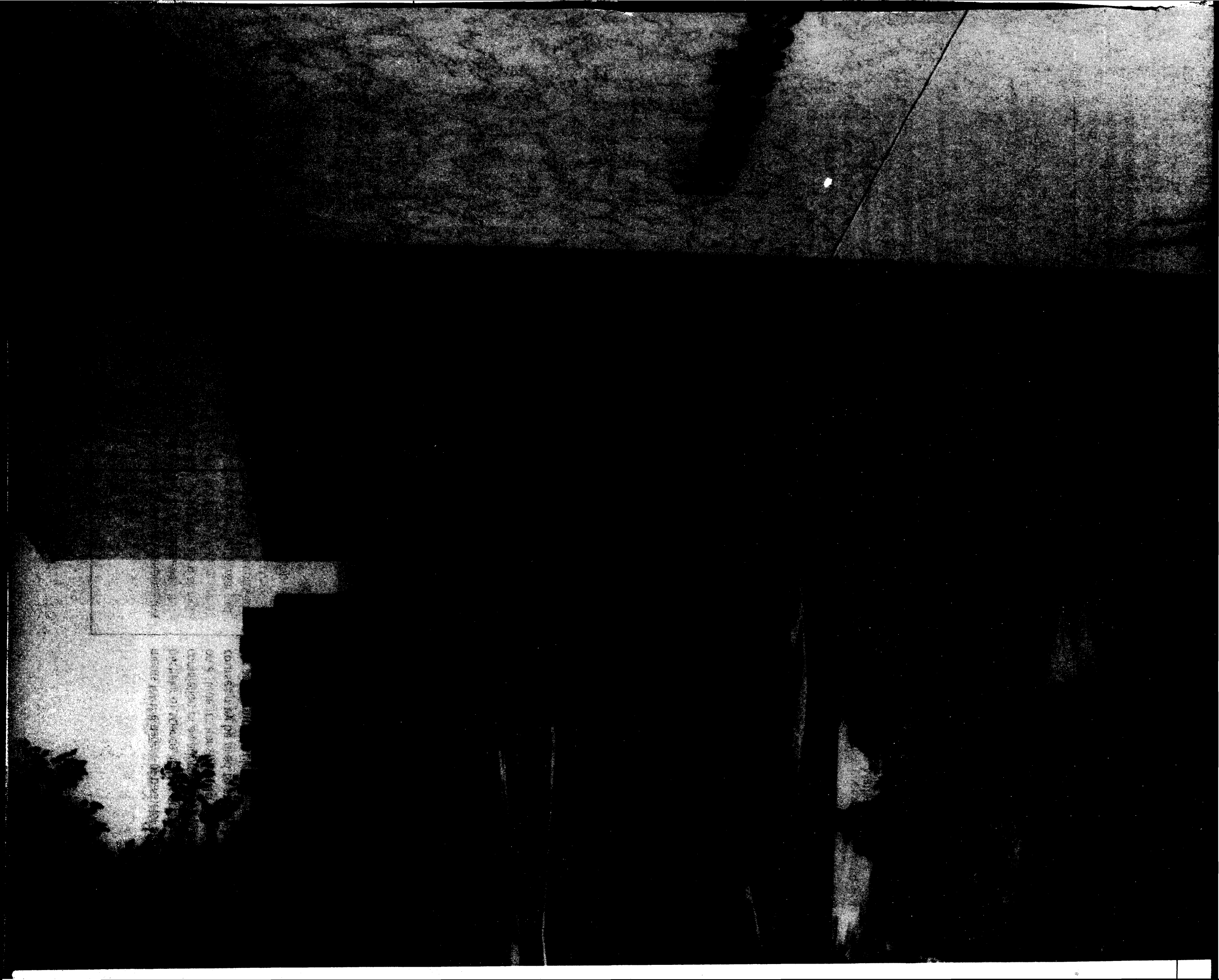
Honors

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.

Thurgood Marshall's 3,000 students pursue majors in a variety of disciplines. About 30 percent choose majors in biology, the physical sciences, mathematics, and engineering; 45 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 center-piece of the general-education requirements, emphasizes a critical examination of the human condition in a multicultural society. This three-quarter core sequence, "Dimensions of Culture—Diversity, Justice, and Imagination," challenges students to develop an informed sensitivity to the many cultural perspectives that have shaped civilization. The core sequence is designed as an interdisciplinary, issues-oriented curricular experience that seeks to balance an exploration of uniquely American, Western, and non-Western cultures. 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 as scholars and 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 in local inner city elementary schools as tutors and mentors. Because this activity shares importance with other academic experiences, completion of the PAL program 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. These requirements 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:

1. DIMENSIONS OF CULTURE: This three-course interdisciplinary sequence is entitled "Diversity, Justice and Imagination." 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. NATURAL SCIENCES: Three courses. One course each in biology, chemistry, and physics.
3. MATHEMATICS AND LOGIC: Two courses in mathematics or one course in mathematics and one in computing.
4. HUMANITIES AND CULTURE: Two courses. One course each from ethnic studies and Third World studies.
5. DISCIPLINARY BREADTH: Four courses. Students must complete four courses (three for students graduating with a B.S. degree in engineering) requiring disciplinary breadth. The disciplinary breadth areas include: humanities/foreign language; social sciences; natural sciences; math/engineering. Courses used to satisfy the disciplinary breadth requirement must come from fields noncontiguous to the major field of study. Two of these courses must be upper-division. At least one upper-division course must include significant writing.
6. FINE ARTS: One course in either music, theatre, or visual arts.
7. PUBLIC SERVICE (optional): This four-unit public service option may be used to fulfill one course in Disciplinary Breadth.

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

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-six 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. All students must complete a minimum of fifteen four-unit upper-division courses.
7. A 2.0 or better GPA is required for graduation.

Transfer Students

Since transfer students have a variety of academic options, specific details regarding appropriate general-education requirements will be discussed during the New Student Orientation/Registration Program.

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. 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. A minor consists of six courses or twenty-four units of interrelated course work. A minimum of three upper-division courses must be completed. Only one upper-division course may be taken on a Pass/Not Pass basis. The upper-division courses may not overlap with the major. The department or program may establish more stringent criteria than the minimum established by the college. A formal request for the minor must be approved by the end of the junior year. Petitions are available in the academic advising office.

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 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.

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 courses which train and place them in local elementary schools as tutors and mentors. 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 meeting the established criteria of 3.0 or better and junior standing. (See TEP 130 in the department listing).

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.

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 listing).

Thurgood Marshall Institute

The Thurgood Marshall Institute is heavily devoted to undergraduate research. The institute will organize and support faculty and student group research projects in the area of education and public law; host annual conferences and symposia on related issues; and train 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

Earl Warren College

Earl Warren College opened in the fall of 1974, and currently enrolls 3,500 students. The college is named after Earl Warren, former chief justice of the United States Supreme Court and the only three-term governor of California. Mr. Warren, a native Californian, earned his college and law school degrees at the University of California (B.L. 1912; J.D. 1914). During his governorship, he was an ex-officio member of the UC Board of Regents for eleven years. Mr. Warren 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, he 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, Mr. Warren 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 an active role 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 encouraged to identify their abilities and interests, examine career possibilities, and prepare for the future.

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 a student 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

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 a 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 College 10A-B, the required writing sequence, must be taken immediately following completion of the Subject A requirement. The courses aim primarily to help the student develop an authentic voice in writing and an increasingly conscious control of language. The sequence moves from free writing through narrative to writing of a structural and critical complexity comparable to that of the college essay. Classes are small and are taught in workshop style, devoting most of their time to the discussion of student papers.
2. The college also requires that all students complete a course titled "Ethics and Society," offered jointly by the political science and philosophy departments (Philosophy 27/ Political Science 27). This course must be taken by the end of the second year at UCSD.
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 major. For all students other than B.S. engineering majors, two **focused collections of courses (Programs of Concentration)** of six courses each are required outside of the major. A student may choose to declare a minor in a department or interdisciplinary

tion. These areas of study must cover the two disciplines outside the student's centration. A few programs of concentrations 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 in the upper division.

All Programs of Concentration and Area Studies must be approved by Earl Warren College Academic Advising. A brochure entitled "Earl Warren College General Education and Graduation Requirements" 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 have 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 departments and the college provost office. If the two majors are from different discipline areas, one program of concentration or area study from the third 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 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 the existing majors. The proposal must first be approved by a faculty adviser and then approved by the College Executive Committee.

Minors

Earl Warren students may pursue a departmental minor beyond the general-education requirements. A Program of Concentration applied toward the general-education requirement may not be listed as a minor. 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 a C average (2.0) or better in all work attempted at the University of California.
6. Satisfy the college residency requirement that thirty-six of the last forty-four units passed (nine of the last eleven courses) must be taken as a student in the college.
7. Pass a minimum of forty-five four-unit academic courses or their equivalent (180 units). At least fifteen four-unit courses (60 units) must be successfully completed at the upper-division level. No more than 3 units of physical education (activity), whether earned at UCSD or elsewhere, may be used towards degree requirements.

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 and graduation requirement 3 is waived. All other transfer students must complete the same 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 3.8 GPA and SAT scores of 710 verbal and 650 in mathematics, or are National Merit Scholars or Regents Fellows, are eligible for admission to the 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. 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.")

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 in the program for a maximum of sixteen units in increments of four, eight, or twelve units per quarter. Although most placements are in the San Diego area, the Academic Internship Program is national 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; 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

Founded in 1988 as UCSD's fifth college, Eleanor Roosevelt College was named in 1994 for the former First Lady, advocate for civil rights at home and abroad, delegate to the United Nations, chair of the UN Commission o Human Rights, and member of the Peace Corps Advisory Council.

The ERC general-education curriculum was established in the tradition of broad liberal art programs. It includes basic studies in a range c disciplines and intellectual skills plus a strong background in comparative social and political systems and foreign language. It is designed t expand writing, analytic, quantitative, and crit cal thinking skills in order to prepare students to be capable world citizens. Because we also share our namesake's commitment to an international education, we encourage our student to explore opportunities for study, work, or travel abroad.

The world that today's student will inherit is characterized by rapid scientific and technological change, rich cultural diversity and intense social and political interactions. At Eleanor Roosevelt College, our goal is to prepare students to be informed and contributing citizens, whatever their chosen major and wherever they elect to live and work.

In the freshman and sophomore years, all students take "The Making of the Modern World," a unique six-course sequence which introduces them to changes in the great societies, cultural traditions, and state systems of the modern world.

The rationale behind this core curriculum is well articulated in one of its texts: "Perhaps the only constraint under which our own age operates is the fact that as the world develops into a truly global community, we increasingly share the same human experience and thus equal responsibility for the world we make." (Greaves et al., *Civilizations of the World,* Harper Collins, 1990, Vol. 2, p. 1050). Every Eleanor Roosevelt student studies at least one foreign language. In the junior and senior years, in addition to his or her major field, each student chooses a geographic area or an American ethnic subculture to study in depth.

Eleanor Roosevelt College's international emphasis complements and enhances any major. Students seeking careers in fields as diverse as business, law, public policy, engineering, the sciences, and the arts or humanities find the college's programs equally valuable.

Although study abroad is not required, Eleanor Roosevelt students are encouraged to spend part of their academic career in another country, and more than a third of them usually choose to do so. In many cases, financial assistance can be obtained. A variety of possibilities are available, including short-term or year-long academic programs, work-abroad opportunities, and career-related internships.

Eleanor Roosevelt College is well known for its strong sense of student community. Not only do students comment on the close-knit community in the residence halls and apartments, but also interact through the Making of the Modern World series. In addition, the wide variety of social activities and other opportunities to become involved reflect the interests and needs of both resident and commuter students. Dances, concerts, and coffeehouses are regularly scheduled throughout the year, along with informal meetings with faculty and discussions on current events. Students are encouraged to get involved in close to a dozen organizations sponsored by the college. These experiences can range from helping organize the semi-formal dance and Eleanor Roosevelt Inaugural Ball to tutoring Native American teens at local reservations. In keeping with the philosophy of the college, much of the programming centers around the theme, "A Celebration of Cultures at Home and Abroad." In each full month of the academic year, a different region of the world is showcased through a variety of student initiated programs. International House, a residential facility for upper-class and graduate international and American students, is also located on the Eleanor Roosevelt College campus.

General-Education Requirements

General-education requirements are established by the Eleanor Roosevelt College faculty in order to ensure that students acquire a solid background in liberal arts and sciences, as well as special exposure to international studies. The faculty and staff of the college offer both group and individual advising on academic options and their career implications. Students are particularly encouraged to consult an academic adviser in the Eleanor Roosevelt College Provost's Office to initiate plans for an overseas study or internship experience.

The schedule below shows a model program leading to completion of most general-education requirements during the lower-division years. Variations will occur, of course, depending upon the student's academic preparation, choice of major, and individual interests and priorities. Students are strongly urged, however, to adhere to this program as closely as possible in order to assure timely completion of all requirements for graduation.

The general-education requirements are:

1. **The Making of the Modern World:** A six-course interdisciplinary sequence taken in the freshman and sophomore years. The

sequence examines both Western and non-Western cultures historically and comparatively. Four of the quarters carry four units of credit. Two of them, taken in winter and spring of the freshman year, carry six units, with intensive instruction in university-level writing. Written work is also required in the remaining four courses. For detailed course descriptions, see "The Making of the Modern World" in departmental listings.

2. **Foreign Language:** Three courses in a single language other than English. Students who can demonstrate they are biliterate by performance on a special examination may fulfill this requirement by completing two courses in a single foreign language.
3. **Fine Arts:** Two courses, to include study of both Western and non-Western music, theatre, and/or visual arts. Please consult the Eleanor Roosevelt College Academic Advising Office for a list of acceptable courses.
4. **Mathematics/Computer Science:** Two courses to be chosen from offerings in precalculus, calculus, statistics, symbolic logic, and computer sciences. Consult the Academic Advising Office for a list of acceptable courses.
5. **Natural Sciences:** Two courses to be chosen from those offered by the Departments of Biology, Chemistry and Biochemistry, Physics, and/or Earth Sciences. Consult the Academic Advising Office for a list of acceptable courses.
6. **Regional Specialization:** Three courses dealing with a single geographic region. Areas of specialization, as established by the college, are designed to be broad enough to ensure course availability but narrow enough to ensure coherence of subject matter. Courses may be chosen from a wide variety of offerings in humanities, social sciences, and fine arts. At least two of the three courses required must be taken at the upper-division level. Consult the Eleanor Roosevelt Academic Advising office for a list of regional specialization areas and courses. (See "Minors" below regarding application of regional specialization course work to completion of an optional minor.)

Model Program

FALL	WINTER	SPRING
FRESHMAN YEAR		
Making/Modern World I	Making/Modern World 2	Making/Modern World 3
foreign language	foreign language	foreign language
fine arts	math/computer science	elective
Subject A or elective	fine arts	math/computer science
SOPHMORE YEAR		
Making/Modern World 4	Making/Modern World 5	Making/Modern World 6
natural science	natural science	elective
elective	elective	elective
elective	elective	elective or regional specialization

JUNIOR AND SENIOR YEARS

regional specialization (total of three courses, of which at least two must be upper-division)
major course work
electives

Transfer Students

Transfer students must take three quarters of "The Making of the Modern World." In consultation with academic advisers from the college each student will determine which three courses shall be used to meet this requirement, although a sequence is recommended. Students who have not met their freshman writing requirement elsewhere must complete it by taking MMW 2 and/or 3 as part of their three-course requirement.

Majors

An Eleanor Roosevelt College student may choose any undergraduate major offered at UCSD. (Students may choose to complete more than one major, provided that all Academic Senate regulations concerning double majors

are met.) Most majors require the completion of specified "pre-major" or prerequisite courses at the lower-division level before enrolling in upper-division major courses. For some majors, admission to upper-division course work is contingent upon a satisfactory grade-point average in certain pre-major courses. Students are strongly encouraged to work closely with department faculty advisers as well as college academic advisers to ensure adequate and timely preparation for the major. Depending upon the student's choice of major and level of preparation, graduation within four years or within the minimum number of units required may not be feasible. Each academic department has, in its section of this catalog, a paragraph entitled "The Undergraduate Program." Students are encouraged to read these sections carefully, for they explain both the extent and the nature of the upper-division program.

The Eleanor Roosevelt 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. It normally includes regular course work and independent study representing a minimum of twelve four-unit courses. A regular member of the faculty must serve as an adviser to the student. For a course to count for the individual studies major, the student must earn a grade of C– or better. Further information may be obtained from the Eleanor Roosevelt College Academic Advising Office.

Minors

Although no minor is required for Eleanor Roosevelt College students, completion of a minor can be a significant educational or preprofessional asset. Students who wish to do so may combine foreign language course work with regional specialization course work in a related region to earn an individualized minor in, for example, Asian or Middle Eastern studies. Such minors must conform to Academic Senate policies, including completion of at least six courses (twenty-four units), with at least three courses (twelve units) at the upper-division level. Upper-division courses applied toward a minor may not be used to meet major requirements. Eleanor Roosevelt College students also have the option of completing any other approved campuswide departmental or interdepartmental minor. Students interested in completing a minor should consult an Eleanor Roosevelt College academic adviser as early as possible. Minors will be noted on the student's transcript at graduation.

Graduation Requirements

To receive a bachelor's degree from Eleanor Roosevelt College, a student must:

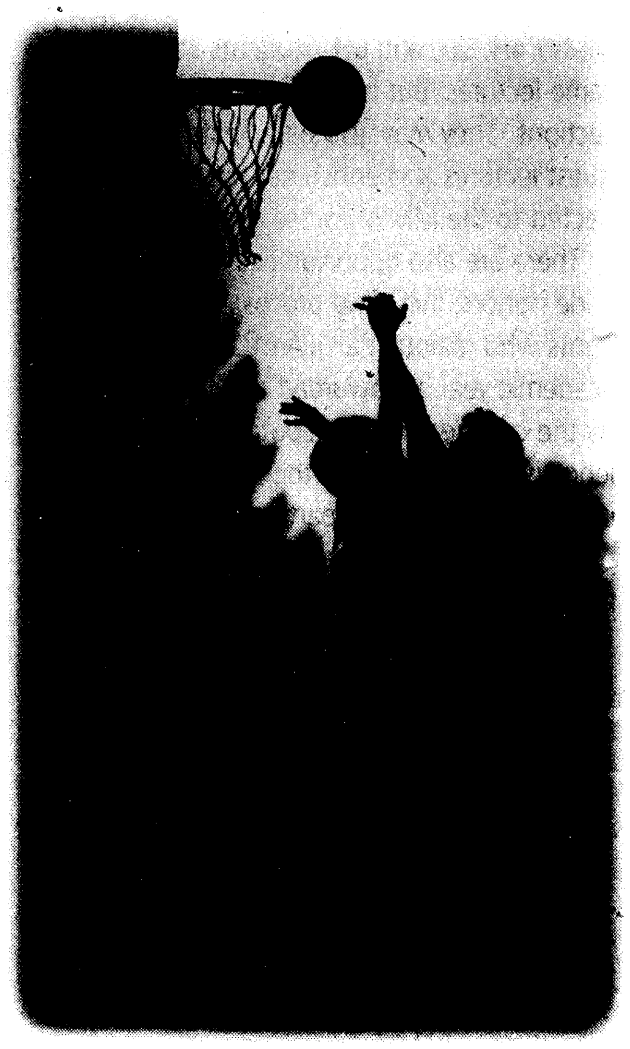
1. Satisfy the university Subject A requirement in English composition. (See "Undergraduate Admissions, Policies and Procedures.")
2. Satisfy the university requirement in American History and Institutions. (See "Undergraduate Admissions, Policies and Procedures.")
3. Fulfill the general-education requirements as described above.
4. Complete an approved departmental or interdepartmental major, meeting all major requirements as specified by the major department or program.
5. Satisfy the senior residency requirement that thirty-six of the final forty-five units passed must be completed as a registered Eleanor Roosevelt College student. For more information, see "Academic Regulations: Senior Residence."
6. Complete and pass a minimum of 180 units for the B.A. or B.S. degree. At least 60 of these units must be completed at the upper-division level. (The bachelor of science degree is offered only in certain approved science and engineering majors. See departmental listings for information on degrees offered.) For all students, a grade-point average of at least 2.0 ("C") is required for graduation.

Pass/Not Pass Grading Option

1. No more than one-fourth of the total University of California, San Diego units may be counted in satisfaction of degree requirements on a Pass/Not Pass basis, including physical education courses.
2. Any elective may be taken on a Pass/Not Pass basis.
3. Courses that meet Eleanor Roosevelt College general-education requirements in the following areas may be taken on a P/NP basis: fine arts, natural science, math/computer science, and one upper-division regional specialization course. All other general-education courses must be taken for a letter grade.
4. 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.

Study or Internship Abroad

Although travel abroad is not required, all Eleanor Roosevelt College students are strongly encouraged to study or to complete a career-related internship in another country and nearly half of them do so. Opportunities for study abroad have increased dramatically in recent years, with possible placement ranging from Western Europe to Thailand. Financial assistance is available. College faculty and staff work closely with campuswide offices, including Education Abroad, Opportunities Abroad, and Academic Internship, to ensure access to a wide variety of international experiences. Students should consult an academic adviser in the Eleanor Roosevelt College Provost's Office during the freshman or early sophomore year to initiate planning for study or work abroad.



Honors

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 both 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 also receive additional free computer time. Second-year students with GPAs of 3.5 or higher have the opportunity to pursue independent study with individual faculty. Honors students may also receive opportunities for particular cultural and social events.

Additional honors opportunities are offered in the MMW program. 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 the same lectures, but meet in separate honors sections. They may also participate in special guest lectures and enrichment activities connected to the MMW course content.

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 receive college or university honors or election to Phi Beta Kappa.

Undergraduate Admissions, Policies and Prodecures

All communications concerning pre-applicant undergraduate admission for U.S. citizens should be addressed to Office of Admissions and Outreach, University of California, San Diego, 9500 Gilman Drive, Dept. 0337, La Jolla, California 92093-0337.

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 collegiate-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 Outreach.

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 claims citizenship in another country and has a nonimmigrant visa.

Early Admission Honors

Through this program, a very few specially qualified students in local high schools are admitted to UCSD. Beginning in the fall, they attend one or two classes at UCSD during their senior year in high school at reduced cost. For additional information call or write:

University of California, San Diego
Office of Admissions and Outreach
9500 Gilman Drive, Dept. 0337
La Jolla, California 92093-0337
(619) 534-4831.

Educational Opportunity Program/Student Affirmative Action

The Educational Opportunity Program (EOP) and the Student Affirmative Action Program (SAA) are recruitment and academic support programs established by the university to increase the enrollment of educationally disadvantaged and low-income students. Students are provided with pre-admission counseling, academic and personal support services. EOP eligibility is based on family income level. SAA focuses on underrepresented students who are African-American, Mexican-American, or American Indian, with no consideration of family income or parental educational level.

Services available to EOP and SAA students cover a broad range of needs. Recruitment and application-related services include visits to high schools and community colleges, pre-admission counseling, application fee waivers (EOP only), application follow-up, and deferral of the Statement of Intention to Register fee (EOP only). Other support services include referrals to obtain campus housing and financial aid counseling. Academic support for EOP and SAA students is offered through the Office of Academic Support and Instructional Services (OASIS). OASIS sponsors Summer Bridge (a summer residential program), the Mathematics, Science, and Writing Enrichment Program, and peer counseling. OASIS also gives priority for individual tutoring to EOP and SAA students and offers a variety of academic skills workshops and cross-cultural programming.

Prospective EOP and SAA students should obtain a UC undergraduate application packet from any high school or community college counselor or directly from UCSD. All EOP applicants must be California residents, with the exception of American Indians. SAA applicants do not have to be residents of California. To be considered for SAA, complete the ethnic identity information entry on the application. If your ethnic identity is African-American, Mexican-American, or American Indian you will be included in the Student Affirmative Action program. To apply for EOP, fill in the ethnic identity information and 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.

Application Checklist:

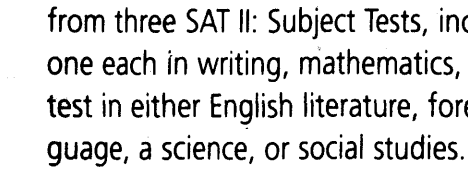
1. File a UC Undergraduate Application for Admission with the University of California Application Processing Center, P.O. Box 23460, Oakland, CA 94623-0460 (include appropriate fee amount; fee waivers are available in hardship cases).
2. Include the required autobiographical essay of personal information covering your family background (i.e., education, size, employment, etc.) and any special circumstances.
3. If you are a freshman applicant, you must also submit assessment test scores from ei-

ther the American College Test (ACT), or the Scholastic Assessment Test (SAT I: Reasoning Test). Additionally, scores must be reported from three SAT II: Subject Tests, including one each in writing, mathematics, and one test in either English literature, foreign language, a science, or social studies.

4. If you are a transfer applicant, request official transcripts from your high school and all colleges you have attended. Have them sent directly to the UCSD Office of Admissions and Outreach.

Financial aid is available to eligible EOP and SAA students from the regular state, federal, and university sources administered through the UCSD Financial Services 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 Student Financial Services Office. Pre-application assistance should be sought from your high school or community college counselor as well as from the Office of Admissions and Outreach. For additional information about EOP or SAA eligibility requirements, program services, or general information regarding UCSD, call or write:

University of California, San Diego
Office of Admissions and Outreach
9500 Gilman Drive, Dept. 0337
La Jolla, California 92093-0337
(619) 534-4831.



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, or Eleanor Roosevelt). 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 Outreach 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 five 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.

MAJORS

As of the printing of this catalog the Departments of Applied Mechanics and Engineering Sciences, Computer Science and Engineering, Electrical and Computer Engineering, and Bioengineering are screening admissions to the major, and students are admitted to pre-major status only. The mathematics-computer science major also admits to pre-major status only. As a pre-major you must satisfy all prerequisites before admission to the major.

If openings are available, you may have to pass specific courses with grades of a given level to become a degree candidate in your preferred major. This 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, however, 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. Simply stated, 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.

You should 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 met more than the minimum requirements; thus selection depends on additional factors.

For example, you should take as many honors and advanced placement courses as possible and should try to exceed the minimum academic subject requirements in all subjects,

particularly the a-f requirements and/or courses in English, mathematics, laboratory sciences, and foreign languages. 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 admissions 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 or exceptional personal talent, and that encompasses the broad diversity of California."

Freshmen 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.

1. All freshmen will be ranked using an academic index based on the high school grade-point average calculated on all academic courses completed in the subject areas specified in the university's eligibility requirements (the a-f subjects); scores on the required tests–the SAT I: Reasoning Test or the American College Test, and the SAT II: Subject Tests; the number and content of courses successfully completed in academic subjects beyond the minimum specified in the university's eligibility requirements; and the number of university approved accelerated, Advanced Placement, and honors courses completed or in progress. The academic index will be used to select 60 percent of the admits.
2. The remaining 40 percent of the freshman admits, with the exception of those admitted through special action, are selected using the academic index as the basis for selection. The applicants not in the 60 percent above will be re-ranked after bonus points are added to the index based on consideration of other factors, including low family income, physical disabilities, community and institutional service, special talents, interests, leadership, honors and awards received, and special or personal circumstances or difficulties.

Advanced-Standing Selection

The admission of transfer applicants will be limited to those who have satisfactorily completed minimum admission requirements as well as 60 transferable semester-units (90 quarter-units) and will be on a priority basis. In priority order, the following will be admitted: Transfer Admissions Guarantee (TAG) applicants satisfying the admission criteria; California community college applicants with 60 transferable units completed one term prior to entrance and a GPA of 2.80 or better; Intercampus Transfers (ICTs) with 60 transferable units (90 quarter-units) completed one term prior to entrance; California residents attending public or private four-year institutions (in or out of state) with 60 transferable units completed one term prior to entrance; and non-California residents attending public or private four-year institutions with 60 transferable units completed one term prior to entrance.

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 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. Applicants from high schools outside of California may find the following guidelines helpful in determining acceptability of courses.

Specific "a-f" Course Requirements

a. **History/Social Science: 2 units**

Two years of history/social science, including one year of United States history *or* one-half year of United States history and one-half year of civics or American government, and one year of world history, cultures, and geography; taken in the ninth grade or later.

b. **English: 4 units**

Four years of college preparatory English– composition and literature. (All English courses must require frequent and regular practice in writing expository prose compositions of some length. Also, not more than two semesters of ninth-grade English will be accepted for this requirement.)

c. **Mathematics: 3 units**

Three years of mathematics–elementary alegebra, geometry, and intermediate algebra. (Mathematics courses taken in grades seven and eight may be used to meet part of this requirement if they are accepted by the high school as equivalent to its own courses.)

d. **Laboratory Science: 2 units**

Two years of laboratory science providing fundamental knowledge in at least two of these three areas: biology, chemistry, and physics. Laboratory courses in earth/space sciences are acceptable if they have as prerequisites or provide basic knowledge in biology, chemistry, or physics. Not more than one year of ninth-grade laboratory science can be used to meet this requirement.

e. **Language Other than English: 2 units**

Two years of one language other than English in courses that provide instruction in grammar, vocabulary, reading, and composition, and that emphasize the development of aural and oral skills.

f. **College Preparatory Electives: 2 units**

Two units in addition to those required in a. through e. above, to be chosen from the following subject areas: history, English, advanced mathematics, laboratory science, language other than English (a third year in the language used for the "e" requirement or two years of another language), social science, and fine arts. (In general, elective courses should involve considerable reading and should aim to develop a student's analytical and reasoning ability and skill with written and oral exposition.)

ELIGIBILITY INDEX

"a-f" GPA	ACT[1]	SAT I TOTAL[2]	"a-f" GPA	ACT[1]	SAT I TOTAL[2]
2.82	36	1590/1600	3.06	25	1030/1150
2.83	36	1570/1590	3.07	24	1010/1130
2.84	35	1540/1580	3.08	23	980/1110
2.85	35	1520/1570	3.09	23	960/1090
2.86	35	1500/1560	3.10	22	940/1070
2.87	34	1470/1550	3.11	22	910/1050
2.88	34	1450/1530	3.12	21	890/1030
2.89	33	1430/1510	3.13	21	870/1010
2.90	33	1400/1490	3.14	20	840/980
2.91	33	1380/1470	3.15	20	820/960
2.92	32	1360/1450	3.16	19	800/940
2.93	31	1330/1430	3.17	19	770/920
2.94	31	1310/1400	3.18	18	750/900
2.95	31	1290/1370	3.19	18	730/870
2.96	30	1260/1350	3.20	17	700/840
2.97	30	1240/1330	3.21	17	680/810
2.98	29	1220/1310	3.22	16	660/780
2.99	28	1190/1290	3.23	16	630/750
3.00	28	1170/1270	3.24	15	610/720
3.01	27	1150/1250	3.25	15	590/690
3.02	27	1120/1230	3.26	14	560/660
3.03	26	1100/1210	3.27	14	540/630
3.04	26	1080/1190	3.28	13	520/600
3.05	25	1050/1170	3.29	12	490/570

[1] ACT composite, scored in intervals of 1 point, from a minimum of 1 to a maximum of 36.
[2] SAT I total, scored in intervals of 10 point, from a minimum of 400 to a maximum of 1600. Use the first score listed if you took the test prior to April 1995. Use the second score if you took the test April 1995 or later.

Courses Satisfying the "f" Requirement

History and English Elective courses that fit the general description in "f" above are acceptable.

Advanced Mathematics Trigonometry, linear algebra, precalculus (mathematical analysis), calculus, statistics, computer science, and similar courses are acceptable. Courses containing significant amounts of material from arithmetic or from shop, consumer, or business mathematics are not acceptable.

Laboratory Science Courses in the biological and physical sciences are acceptable.

Language Other than English Elective courses may be in either the same language used to satisfy the "e" requirement or in a second language. If a second language is chosen, however, at least two years of work in that language must be completed.

Social Science Elective courses that fit the general description in "f" above are acceptable. In addition, these courses should serve as preparation for lower-division work in social science at the university. Courses of an applied, service, or vocational nature are not acceptable.

Fine Arts Elective courses in fine arts should enable students to understand and appreciate artistic expression, and to talk and write with discrimination about the artistic material studied. Courses devoted to developing creative artistic ability and courses devoted to artistic performance are acceptable. Courses that are primarily recreational or are offered under physical education are not acceptable.

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 unixÀ 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. If you are applying for admission to the fall term, you should 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 will be reported.
2. Three Subject Tests (SAT II)

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

If tests are repeated, the university will accept the highest score received. The best SAT I score is a total of the math and verbal sections taken at the same sitting. See your counselor for information and registration forms or write to the College Board ATP, P.O. Box 6200, Princeton, New Jersey 08541-6200. For ACT information, write to the ACT Program, P.O. Box 168, Iowa City, Iowa 52240. You must arrange to take these tests no later than December of your senior year.

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.

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

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 eligible applicants. See "UCSD Admission Policy and Selection Criteria."

Eligibility Index: An "Eligibility Index" is used to determine minimum eligibility for California applicants. If you make a perfect score on the SAT I (1600) or the ACT (36) you need a GPA of only 2.82 to be eligible for admission. On the other hand, if you have a GPA of 3.30 or better, you are eligible even with the lowest test scores. Between these extremes, the Eligibility Index table is used. If you know your GPA (using the best grades earned in grades ten, eleven, and twelve to meet minimum requirements in the "a through f" pattern) the table will show the required test score; conversely, if you know your SAT I total or your ACT composite, the table will show the required GPA.

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 eligible applicants. 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. These subjects, referred to as "a through f," are the same for the nonresident as for the resident. (The "Eligibility Index" applies to the California applicant only.)

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 in no way intended to constitute an outline for a valid high school program. The courses listed were chosen largely 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.

A science major, for example, besides taking courses in chemistry, physics and biology, 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 foreign language requirement, you should have completed more than the two years of foreign language needed for admission.

You should understand that the "a through f" 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 to their dismay 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 problems 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 should 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: Many students are not prepared for either the kinds or amounts of reading demanded of freshmen at the university. You should become proficient in reading and understanding technical materials and scholarly works. You should learn to read analytically and critically, actively questioning yourself about the author's intentions, viewpoint, arguments, and conclusions. You should also 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, and should 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 aptly and precisely convey the intended meaning; (d) construct effective sentences, i.e., sentences that economically and successfully convey the writer's ideas and display a variety of structures; (e) demonstrate an awareness of the conventions of standard written English, avoiding such errors as sentence fragments, run-together sentences, faulty agreements, and improper pronoun references; and (f) punctuate, capitalize, and spell correctly.
If you plan to attend the university, you must 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 undergraduate majors require preparation in mathematics beyond that necessary for admission to the university. All majors in the natural and life sciences, engineering, and mathematics require calculus. Many majors in the social sciences require statistics or calculus, sometimes both. If you have selected a major that requires either calculus or statistics you should expect to take that course during your freshman year at the university.

Calculus is also required for undergraduates preparing for careers in environmental sciences, dentistry, medicine, optometry, pharmacy, and biostatistics. Many students are not aware of the large number of fields outside the natural and mathematical sciences which require calculus or statistics as prerequisites.

You should prepare yourself for university courses in calculus while you are still in high school. In addition to the three years of mathematics required for admission, you should take a year of precalculus mathematics. These courses should include: (a) basic operations with numerical and algebraic functions; (b) operations with exponents and radicals; (c) linear equations and inequalities; (d) polynomials and polynomial equations; (e) functions and their graphs; (f) trigonometry, logarithms, and exponential functions; and (g) applications and word problems. Students who plan to enter a field which requires statistics should take at least the second year of algebra.

If you are not proficient in basic and intermediate algebra, you will be at an enormous disadvantage in the university. You will have to take one or more precalculus courses before beginning calculus and may also have to take preparatory courses before beginning statistics. The necessity to take these preparatory courses could seriously delay your undergraduate studies.

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, as determined by the college. 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 should be encouraged to take AP tests, when appropriate. Counselors should not overlook the opportunity for 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 below. Credit is expressed in quarter-units.

Art (Studio)
- Drawing Portfolio 8
- General Portfolio 8
- *(8 unit maximum for both tests)*

Art History 8

Biology 8

Chemistry 8

Computer Science
- Computer Science A 2
- Computer Science AB 4
- *(4 unit maximum for both tests)*

Economics
- Microeconomics 4
- Macroeconomics 4

English
- English Language 8
- English Language 8
- *(8 unit maximum for both tests)*

Government and Politics
- United States 4
- Comparative 4

History
- United States History 8
- European History 8

Language Other than English
- French Language 8
- French Literature 8
- German Language 8
- German Literature 8
- Spanish Language 8
- Spanish Literature 8
- *(German Literature no longer offered)*

Latin
- Latin Literature 4
- Vergil 4

Mathematics
- Calculus AB 4
- Calculus BC 8
- *(8 unit maximum for both tests)*

Music
- Theory 8
- Listening and Literature 8
- *(8 unit maximum for both tests; Listening and Literature no longer offered)*

Physics
- Physics B 8
- Physics C1 (Mechanics) 4
- Physics C2 (Electricity and Magnetism) 4
- *(8 unit maximum for all three tests)*

Psychology 4

Requirements met by advanced placement test are described below by college. Even if subject credit or credit toward specific requirements is not mentioned in the college lists, students receive university credit as described above 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

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.

Transfer Eligibility

CALIFORNIA RESIDENTS (MINIMUM REQUIREMENTS)

As a transfer applicant you must meet one of the requirements described below to be considered for admission to the university.

1. If you completed all the "a-f" courses in high school and achieved the required score on the Eligibility Index, you are minimally eligible for admission to the university any time after you have established a grade-point average of 2.0 or better in transferable college courses.

   If you have completed fewer than twelve quarter- or semester-units of transferable college credit since high school graduation, you must also satisfy the Examination Requirement for freshman applicants. See "Examination Requirement."

2. If you achieved the required score on the Eligibility Index but did not complete all the "a-f" subjects in high school, you may be minimally eligible for admission to the university after you have:
   a. Established a college grade-point average of 2.0 or better; and
   b. Completed, with grades of C or better, appropriate college courses in the "a-f" subjects you lacked; and
   c. Completed twelve or more quarter- or semester-units of transferable college credit, or have met the Examination Requirement for freshman applicants.
3. If you did not achieve the required score on the Eligibility Index, or did not achieve the required score and lacked required "a-f" subjects, you may be minimally eligible for admission to the university after you have:
   a. Established a college grade-point average of 2.4 or better in transferable courses; and
   b. Completed eighty-four quarter- or fifty-six semester-units of transferable college credit; and
   c. Completed one of the following:
      I. Appropriate college courses, with grades of C or better, in the "a-f" subjects you lacked. Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; or
      II. One college course in mathematics, one in English, and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better.

      The course in mathematics must assume a proficiency level equivalent to three years of high school mathematics (i.e., elementary algebra, advanced algebra, and geometry). The course may be trigonometry or a more advanced course in mathematics that employs the topics of intermediate algebra or a transferable statistics course offered by either the mathematics or statistics department and for which advanced algebra is a prerequisite.

PLEASE NOTE: Each year UCSD receives more applications from eligible transfer students than the campus can accommodate. In addition to satisfaction of 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

Advanced Placement Credit:

EXAM AND UNITS	UCSD COURSE EXEMPTIONS (OR USE ON MAJOR)	REVELLE COLLEGE
Art (Studio) • Drawing Portfolio ..... 8 • General Portfolio ..... 8 *(8-unit maximum for both tests)*	None	Fulfills fine arts requirement or 2 courses of the noncontiguous area of focus or may be used as 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.
Biology 8	Score of 4 or 5 = exempt from any 2 courses of Biology 1,2,3 sequence. Student allowed to take 1 course from this sequence for credit. Score of 3 = Biol. 10; may take Biol. 1, 2, 3 for credit.	Score of 3, 4, or 5 meets Revelle biology requirement even though Biol. 10 does not.
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,6B,6C or Chem. 11; may take Chem. 6BH,6CH for credit	Partial completion of natural science requirement
Computer Science • Computer Science A ..... 2 • Computer Science AB ..... 4 *(4-unit maximum for both tests)*	Score of 5 only on AB exam may possibly be equivalent to CSE 10. Score of 3 or 4 on A or AB exam = elective units. Students must see faculty adviser.	1 course on noncontiguous area of focus.
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.
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.
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.
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.
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.
Government and Politics • American 4	Score of 3, 4, or 5 satifies American History and Institutions. Score of 3, 4, or 5 = exempt Poli. Sci. 10.	1 course toward social science requirement or 1 course of noncontiguous area of focus.
Government and Politics • Comparative 4	Score of 3, 4, or 5 = exempt Poli. Sci. 11.	1 course toward social science requirement or 1 course of noncontiguous area of focus.
History • American 8	Score of 3, 4, or 5 = exempt 2 quarters U.S. History: May take HILD 2A, 2B or 2C to complete sequence. Satifies American History and Institutions.	2 courses toward social science requirement or 2 courses of noncontiguous area of focus.
History • European 8	None	2 courses of the noncontiguous area of focus.
Mathematics • Calculus AB ..... 4 • Calculus BC ..... 8 *(8-unit maximum for both tests)*	Score of 4 or 5 AB exam = exempt Math. 20A or 1A. Score of 3 on AB exam = may take Math. 20A for credit; or exempt Math. 1A. Score of 4 or 5 on BC exam = exempt Math. 20A, 20B or 1A, 1B. Score of 3 on BC exam = exempt Math. 20A and may take Math. 20B for credit; or = exempt Math. 1A, 1B.	AB exam = 1 course toward math requirement; BC exam = 2 courses toward math requirement.
Music • Listening and Literature ..... 8 • Theory ..... 8 *(8-unit maximum for both tests)*	None	Fulfills fine arts requirement and 1 course of noncontiguous area of focus.
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.	Each 4 units on C exam (Mech. or E&M) can meet 1 course of the natural science requirement.
Psychology 4	Score of 4 or 5 = exempt Psych. 1.	1 course toward social science requirement or 1 course of noncontiguous area of focus.

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

MUIR COLLEGE	THURGOOD MARSHALL COLLEGE	WARREN COLLEGE	ELEANOR ROOSEVELT COLLEGE
8 units of elective credit.	8 units of elective credit.	8 units of elective credit.	8 units of elective credit.
8 units of elective credit.	May apply 1 course toward fine arts requirement.	8 units of elective credit.	1 course toward fine arts requirement.
Score of 3 meets one course of natural science option; score of 4 or 5 meets two courses of natural science option.	1 course of natural science requirement. May also apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Score of 3, 4, or 5 meets one course of natural science requirement.
Score of 4 or 5 meets two courses of natural science option.	May apply 1 course of natural science requirement and may apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Meets 1-2 courses of natural science requirement.
2-4 units elective credit.	AB exam = 1 course toward mathematics/computer/ statistics requirement	May apply toward formal skills or program of concentration. See Warren adviser for details.	Score of 5 = 1 course toward math/ computer science requirement.
Each score of 5 exempts 1 course on social science requirement.	May apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Elective credit.
8 units of elective credit.	8 units of elective credit	8 units of elective credit.	8 units of elective credit.
Determines placement in language sequence if student chooses that option.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	8–16 units of elective credit.
Meets 1 to 2 courses of foreign language option.	May apply 1-2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4-8 units elective credit.
Determines placement in language sequence if student chooses that option.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	8–16 units of elective credit.
1 course toward social science requirement.	May apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4 units of elective credit.
1 course toward social science requirement.	May apply 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4 units of elective credit.
Meets 2 courses of history 2 sequence on humanities option.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	Elective credit.
8 units elective credit only.	May apply 2 courses toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	1 course may apply toward regional specialization. See ERC adviser for details.
AB exam meets 1 course of math option; BC exam completes 2 courses of math option.	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 math/ computer science requirement. BC exam completes math/computer science requirement.
8 units elective credit only.	1 course toward fine arts requirement and 1 course [redacted]ard the disciplinary breadth requirement if non-[redacted]guous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	1 course toward fine arts requirement.
Each 4 units of C exam (Mech. or E&M) can meet 1 course of the natural science option.	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.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	B exam = 1 course 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.
4 units elective credit only.	May apply as 1 course toward disciplinary breadth if noncontiguous to major.	May apply toward program of concentration requirements if noncontiguous to major. See Warren adviser for details.	4 units of elective credit

A student cannot give 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.

California community colleges. See "Advanced-Standing Selection."

Transfer Eligibility

NON-CALIFORNIA RESIDENTS (MINIMUM REQUIREMENTS)

(Also, see "Transfer Eligibility: California Residents.")

If you met the admission requirements for freshman admission as a nonresident, you will be eligible if you have a GPA of 2.8 or higher in college courses that are accepted by the university for transfer credit.

If you were ineligible from high school only because you did not study one or more of the required subjects, you may be minimally eligible for admission to the university after you have:

1. Established an overall grade-point average of 2.8 or better in another college or university;
2. Completed, with a grade of C or better, appropriate college courses in the high school subjects you lacked; and
3. Completed twelve or more quarter- or semester-units of transferable credit, or have met the examination requirement.

If you are a nonresident applicant who graduated from high school with less than a 3.4 grade-point average in the "a through f" subjects required for freshman admission, you must have completed at least eighty-four quarter-units (fifty-six semester-units) of transferable work with a grade-point average of 2.8 or better. In addition, if you lacked any of the required subjects in high school, you must have completed the following:

1. Appropriate college courses, with grades of C or better, in high school subjects you lacked or in which you were deficient (grades lower than C). Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; *or*
2. One college course in mathematics; one in English; and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better. The course in mathematics must assume a proficiency level equivalent to three years of high school mathematics. See II above.

Note: UC mimimum requirement for transfer students will change beginning with applicants for fall 1998 admission.

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.

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, 4 points; B, 3 points; C, 2 points; D, 1 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 Outreach. Applications from students who have more than 135 quarter-units (90 semester-units) of transfer credit and meet selection criteria are considered to have excess units (senior standing). Applicants in this category will 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. A student may earn 105 quarter-units (seventy semester-units) toward a university degree at a community college. Subject credit for courses taken in excess of those units will be granted.

The transferability of units from California community colleges and all other postsecondary institutions proceeds as follows: (1) the UC Office of the President determines unit transfer policies which are binding upon and implemented by each campus' Office of Admissions and Outreach; (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 department. Before applying to UCSD you may obtain more information on many of these matters from the Office of Admissions and Outreach.

Applicants who have completed courses at a postsecondary institution outside the U.S. should have these records sent to the Office of Admissions and Outreach 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 Transfer Agreements

The University of California established two new transfer policies in 1988. These two policies, UC Transfer Reciprocity and Intersegmental General Education Transfer Curriculum Agreement (described below), allow transfer students to fulfill lower-division breadth and general-education (B/GE) requirements prior to transfer.

Transfer students may elect to fulfill their lower-division B/GE requirements by either of these two policies or may elect to fulfill the B/GE requirements at UCSD. Students electing to satisfy the requirements by either of these agreements are admitted to Warren, Marshall, or Muir College only.

Transfer Admission Guarantee (TAG)

UCSD has a Transfer Admission Guarantee (TAG) program with fourteen California community colleges. Signing a TAG contract and completing the provisions of the contract will guarantee admission to the UCSD college and term of your choice. Completing the TAG core requirements will also guarantee fulfillment of most lower-division, general-education requirements. TAG community college counselors have information regarding this program.

UC Transfer Reciprocity

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 this requirement satisfied on the San Diego campus.

Transfers applying 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 college academic advising office.

Intersegmental General-Education Transfer Curriculum Agreements

Transfers from California community colleges can fulfill the UC lower-division breadth and general-education requirements by completing the Intersegmental General-Education Transfer Curriculum (IGETC). See "Summary Outline."

International Applicants

Applicants who present evidence of above-average scholarship achievement will be considered 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 6152, Princeton, New Jersey 08541-6152, U.S.A. The minimum TOEFL score acceptable is 550.

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. Foreign students whose command of English is slightly deficient will be required to take an English course and, therefore, a reduced program.

In addition to an adequate English-language background, foreign 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").

Foreign 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.

All communications concerning undergraduate admission of international students should be addressed to the Office of Admissions and Outreach, 9500 Gilman Drive, Dept. 0021, University of California, San Diego, La Jolla, California 92093-0021.

Second Baccalaureate/and Limited Status Applicants

Applications received by the Office of Admissions and Outreach from students who have earned a four-year degree will be reviewed by the college provost's office. Limited status (non-degree-seeking) applicants and those seeking a second B.A. or B.S. will be held to the same restrictions as are other new admits; fields that have been closed for admission (such as engineering) will be closed to these students as well. Students will be screened according to the amount of space available in the college; students will also be screened by any departments that have such screening mechanisms for entrance into the major. Students are accepted on an individual basis, and there is no guarantee of admission to the college or to a particular

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 either the California State University or University of California systems 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 CSU or UC, nor is it the only way to fulfill the lower-division, general-education requirements of the CSU or 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 CSU's general-education requirements or those of the UC campus or college to which the student plans to transfer.

English Communication:	One course, English Composition, 3 sem./4–5 qtr.-units; this course is a prerequisite to Critical Thinking
	One course, Critical Thinking-English Composition, 3 sem./4–5 qtr.-units; strong emphasis on writing; prerequisite: English Composition
	One course, Oral Communication[a], 3 sem./4–5 qtr.-units
Mathematics:	One course, Mathematics/Quantitative Reasoning, 3 sem./4–5 qtr.-units
Arts and Humanities:	Three courses, at least one course in arts, and at least one course in humanities, 9 sem./12–15 qtr.-units
Social and Behavioral Sciences:	Three courses in at least two disciplines, social and behavioral sciences, 9 sem./12–15 qtr.-units
Physical and Biological Sciences:	One course in each area, at least one must include a laboratory, two courses, 7–9 sem./9–12 qtr.-units
Language Other than English:	Proficiency equivalent to two years' high school study[b]

[a]For transfer to UC, a course in oral communication is not required.

[b]Students transferring to CSU do not have to meet this requirement.

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 admits. 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 and have filed a program approved by the major department and have had their proposed program reviewed and approved or disapproved by the college. Limited status students are not awarded on-campus housing.

Limited status students are 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 student financial services certifying of the application.

PLEASE NOTE: Since November 1992, UCSD has not accepted applications from students who have earned a four-year degree. Students should check with the Office of Admissions and Outreach for information on whether applications for second baccalaureate or limited status are being accepted.

Undergraduate admissions application packets are available from California high school and community college counselors or from any UC campus admissions office. Complete the Undergraduate Application form in this packet. Follow the accompanying directions carefully and mail to:
University of California,
Undergraduate Application Processing Center
P.O. Box 23460
Oakland, CA 94623-0460

A preaddressed envelope is provided with the 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 file your completed application during the applicable 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 Periods

All UC Campuses, except Berkeley

Fall Quarter 1996:
File November 1–30, 1995

Winter Quarter 1997:
File July 1–31, 1996

Spring Quarter 1997:
File October 1–31, 1996

UC Berkeley Only

Fall Semester 1996:
File November 1–30, 1995

Spring Semester 1997:
File July 1–31, 1996

NOTE: Each campus of the university makes individual determinations regarding the level of transfer students who may apply to that campus. Some campuses do not accept applications for winter and spring. Inquire at the campus Office of Admissions and Outreach. UCSD accepts winter and spring applications only from Transfer Admission Guarantee (TAG) students.

After the priority period has ended, campuses will accept applications only if they still have openings for new students. This means that some campuses may be able to accept additional applications, but others may not. If a campus is closed to new students, applicants will be informed that their applications will not be forwarded to that campus. In this case, a portion of the application fee may be refunded if appropriate.

Adding a Campus

If, after submitting your application, you wish to add a campus or campuses to the one(s) you first listed on your application, you may do so if the campus or campuses you are considering are still accepting applications. Please contact the Office of Admissions and Outreach on each of these campuses for information on which programs are still open and the procedures for adding campuses.

Selecting Campuses and Programs of Study

You are encouraged to approach the selection of a university campus or campuses and a program of study very carefully. You may be familiar with only one or two of the university's eight 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 Outreach can provide you with helpful insights that will help you in the selection process.

College Choice

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

Transcripts

Every applicant is responsible for requesting that the high school of graduation and each college he or she has attended send official transcripts promptly to the Office of Admissions and Outreach.

If you are still attending high school, please DO NOT send a sixth- or seventh-semester transcript; we will make a decision based on the self-reported academic data you have provided in the application. If admitted, you must arrange to send a final official transcript immediately upon completion that includes final grades and date of graduation, or, if you have passed the High School Proficiency Examination, a verification of your Certificate of Proficiency. If you have completed any college courses while in high school, you must arrange to send an official transcript immediately of course(s).

If you are applying for admission as a transfer student, the Office of Admissions and Outreach requires official transcripts from your high school of graduation, and from each college you have attended, including an up-to-date transcript from your present college listing your work in progress.

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. Fill out the application form completely. You must select UCSD colleges in order of preference. Be sure to sign the form.
2. Complete your personal essay and include with the application.
3. Fill in the self-reported academic data and test information carefully and accurately, as instructed in the undergraduate application packet.
4. Mail fall application during the November filing period with fee (check or money order payable to The Regents of the University of California) to:

   University of California
   Undergraduate Application Processing Service
   P.O. Box 23460
   Oakland, CA 94623-0460
5. Arrange to 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 the UCSD Office of Admissions and Outreach. Final high school transcripts must be on file in the UCSD Office of Admissions and Outreach by July 15.

Notification of Admission

Admission–Freshmen

If you are a fall-term freshman applicant and you filed during the priority filing period, UCSD will notify you whether you have been admitted beginning March 1 and no later than March 31. All offers of admission are provisional until the receipt and verification of your tests 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 admissions will be rescinded if there are discrepancies between your official transcripts and your self-reported academic record; you do not complete the courses listed as "in progress" or "planned"; you do not complete your twelfth-grade courses at the same academic level you achieved in previous course work.

Admission–Transfer

If you are applying to transfer, the campuses may notify you any time between April 1 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 may be rescinded if there are discrepancies between your official transcript and your self-reported academic record; any college or school attended is omitted from your application; you do not complete the courses listed as "in progress" or "planned;" the specified GPA is not maintained in courses "in progress" or "planned."

ESTIMATED EXPENSES FOR ON-CAMPUS UNDERGRADUATE RESIDENTS OF CALIFORNIA

Non-California residents should estimate approximately $2,567 additional tuition fees each quarter.

	FALL QUARTER	WINTER QUARTER	SPRING QUARTER	TOTAL
University Registration Fee	$238	$238	$237	$713
Educational Fee	1,029	1,029	1,028	3,086
Campus Activity Fee	13.50	13.50	13.50	40.50
University Center Fee	37.50	37.50	37.50	112.50
Recreation Facility Fee	82	82	82	246
Board and Room in Residence Halls (Avg.)	2,292	2,292	2,293	6,877
Transportation (Approx.)	184	184	184	552
Books, Supplies (Approx.)	204	204	204	612
Personal Expenses (Approx.)	420	420	421	1,261
Total	$4,500.00	$4,500.00	$4,500.00	$13,500.00

NOTE: Fees are subject to change by the Board of Regents.
*Estimated

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

After receipt of notification of admission:

1. Read the documents in your admit packet carefully, noting any special provision governing your admission.
2. Request that any outstanding transcripts be forwarded to the Office of Admissions and Outreach to ensure full matriculation.
3. Complete and return to the Office of Admissions and Outreach the Statement of Intention to Register (SIR) and the Statement of Legal Residence (SLR). Please note the deadline to return your Statement of Intention to Register. If your SIR is postmarked after this date, you will be denied enrollment due to space limitations. For fall quarter admits, the deadline for return of your SIR and SLR is May 1 for freshmen and June 1 for transfers.

Statement of Intention to Register (SIR)

Upon receipt of your Statement of Intention to Register (SIR), the Office of Admissions and Outreach provides information to various campus offices including financial aids, housing, and your college provost. You will then receive additional information from each of these offices. The $100 nonrefundable fee accompanying your SIR is applied toward payment of the university registration fee the quarter for which you have been admitted. International applicants outside the territorial United States are not required to submit the $100 deposit with the Statement of Intention to Register.

Even though you may be admitted to more than one campus of the University of California, you can return an Intention to Register 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. Students admitted in the fall quarter will be invited to attend a new-student orientation on the campus during the preceding summer. 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. 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 mandatory for all foreign 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 $13,500 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 best that the university can do to assist the student in planning a budget is to indicate 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.

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 five colleges have the same goals for students, each has developed its own distinctive program. The professional staffs of Revelle, Muir, Marshall, Warren, and Roosevelt Colleges have designed their 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. Parents' attendance is, of course, 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 *Schedule of Classes* for enrollment information, dates, and fee-payment instructions. The *Schedule of Classes* is published prior to each quarter and may be purchased at the UCSD Bookstore.

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.

Priority enrollment is processed using TeSS, the Telephone Student Services system. Continuing undergraduate students are assigned a start time, after which they may call and 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 call TeSS 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 TeSS or in person) or by appropriate withdrawal.

Adding, Changing, and Dropping Courses

After telephone priority and open enrollment periods, students may make any necessary corrections to their class schedules by telephone or by submitting an Add/Change/Drop Card. Students may add courses through the second week of instruction. Please refer to the quarterly *Schedule of Classes* for appropriate approvals required.

After the second week, students may not add courses. However, they may continue to change grading options to the end of the fourth week and to drop courses to 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 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-one and one-half 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, and Roosevelt 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.)

Concurrent Enrollment

Concurrent enrollment in regular sessions at another institution or in UCSD Extension while enrolled on the San Diego campus is permitted only when approved in advance by the provost of the student's college.

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 Bursar's 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 after enrollment are expected to notify the registrar in writing at once. Change-of-address cards are available at the Office of the Registrar, 301 University Center. Students will be held responsible for communications from any university office sent to the last address given 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 demon-

strate self-sufficiency for those years and the current year. (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 49 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 18), 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 postsecondary 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 a member of the U.S. military stationed in California on active duty, unless you are assigned for educational purposes to a state-supported institution of higher education, you may be exempt from the nonresident tuition fee until you have lived in California long enough to become a resident. 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.

Spouse or Other Dependents of Military Personnel

You are exempt from payment of the nonresident tuition fee if you are a spouse or a natural or adopted child or stepchild who is a dependent of a member of the U.S. military stationed in California on active duty. The exemption is available until you have lived in California long enough to become a resident. You must petition for a waiver of the nonresident tuition fee each term you are eligible. If you are enrolled in an educational institution and the member of the military is transferred on military orders to a place outside California where he or she continues to serve in the armed forces, or the member of the military retires from active duty immediately after having served in California on active duty, you may retain this exemption under the conditions listed above.

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 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 Scientific Laboratory). Your parent's 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.

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 at 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, 300 Lakeside Drive, 7th floor, Oakland, CA 94612-3565. **No other university personnel are authorized to supply information relative to residence requirements for tuition purposes.**

You are cautioned that this summary is **not** a complete explanation of the law regarding residence. 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 Social Security number on your check and mail it or drop it in the Central Cashier's drop box.

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 and Perkins Loans, will be 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' current or permanent mailing address.

To make a payment, all that is necessary is to 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).

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

Financial Aid/Remainder Check Disbursement

Student financial aid, graduate support, or fee waivers awarded to pay registration fees will be directly credited to your account and appear on your 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. The Bursar's Office disburses all financial aid checks to students. These include remainder checks and other forms of financial aid such as outside scholarships and Stafford Loans. **All Perkins and university loan borrowers must sign their promissory notes each quarter in the Bursar's Office.** Loan funds will not be released (credited) to student accounts until the promissory notes are signed. The number of class units you are taking will be verified by the Bursar's Office staff at the time of disbursement. Additionally, prior to your check being issued it is necessary for you to sign the required legal paperwork and allow at least five working days for the check to be prepared.

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. It is also required that all graduating students who have received a loan 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 call for an entrance interview appointment at (619) 534-2950.**

Registration and Other Payments through the Central Cashier's Office

Registration payments must be made by mail or in the Cashier's Office drop box as early as possible. The Central Cashier's Office receives payments for *all* university debts. It also cashes checks. 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.)

Registration Stickers

After fees have been paid, students are eligible to pick up their student registration stickers at the Central Cashier's Office or the Bursar's Office. This sticker affixes to the back of your I.D. and certifies you are a UCSD student. The quarterly validation sticker is affixed by the Cashier's Office upon payment of fees, if fees are paid in person. Additionally, a special booth for distribution of the sticker is operated each quarter by the Bursar's Office. After you pay by mail or drop box, wait about five working days in order for your payment to be processed.

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. Student Financial Services stands ready to help you with financial assistance. The Billing Services Unit of the Bursar's Office will counsel you on campus indebtedness which you have already incurred and how to prevent such conditions in the future. It is a University of California regental policy 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 Bursar's Office may authorize a Time Payment Agreement (TPA) with a student.

Deferred Payment Plan

The UCSD Deferred Payment Plan (DPP) 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 applying for the program is enrollment for the term. The Deferred Payment Plan Program 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 fee that must be submitted with the application to the Bursar's Office. This fee is strictly used to offset the costs of the program. Applications may be picked up at the Bursar's Office.

Location

The Bursar's 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 8:30 a.m. until 3:00 p.m.

All other bursar units are open from 9:00 a.m. until 4:00 p.m.

Deadlines and Penalty Fines

Students should refer to the cover of the quarterly *Schedule of Classes* for actual deadline dates.

All prior delinquent debts must also be paid. An optional student health insurance plan is available to undergraduate students and can be purchased at the time registration fees are due. (Health insurance is mandatory for all graduate students and all foreign students.) An additional charge will be made for failure to pay required fees or deposits by the dates announced in this catalog and in the quarterly *Schedule of Classes*. Please note that students who enroll in courses but fail to pay fees by the published deadline will be assessed a late payment penalty fine. Students who fail to enroll in courses prior to the enrollment deadline will be assessed a late enrollment penalty fine. Students who fail to enroll *and* pay fees on time will be assessed both fines. Currently these fines are $50 each. (See "Miscellaneous Expenses" on the next page.)

With the exception of appeals to the legal analyst-residence matters 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. Students who wish to appeal a final decision on residence classification by their campus must do so in writing within forty-five calendar days of notification of the campus's final decision. Such appeals should be addressed to the Legal Analyst-Residence, Office of the General Counsel, University of California, 300 Lakeside Drive, 7th floor, Oakland, CA 94612-3565.

Receipts of proof of payment 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.

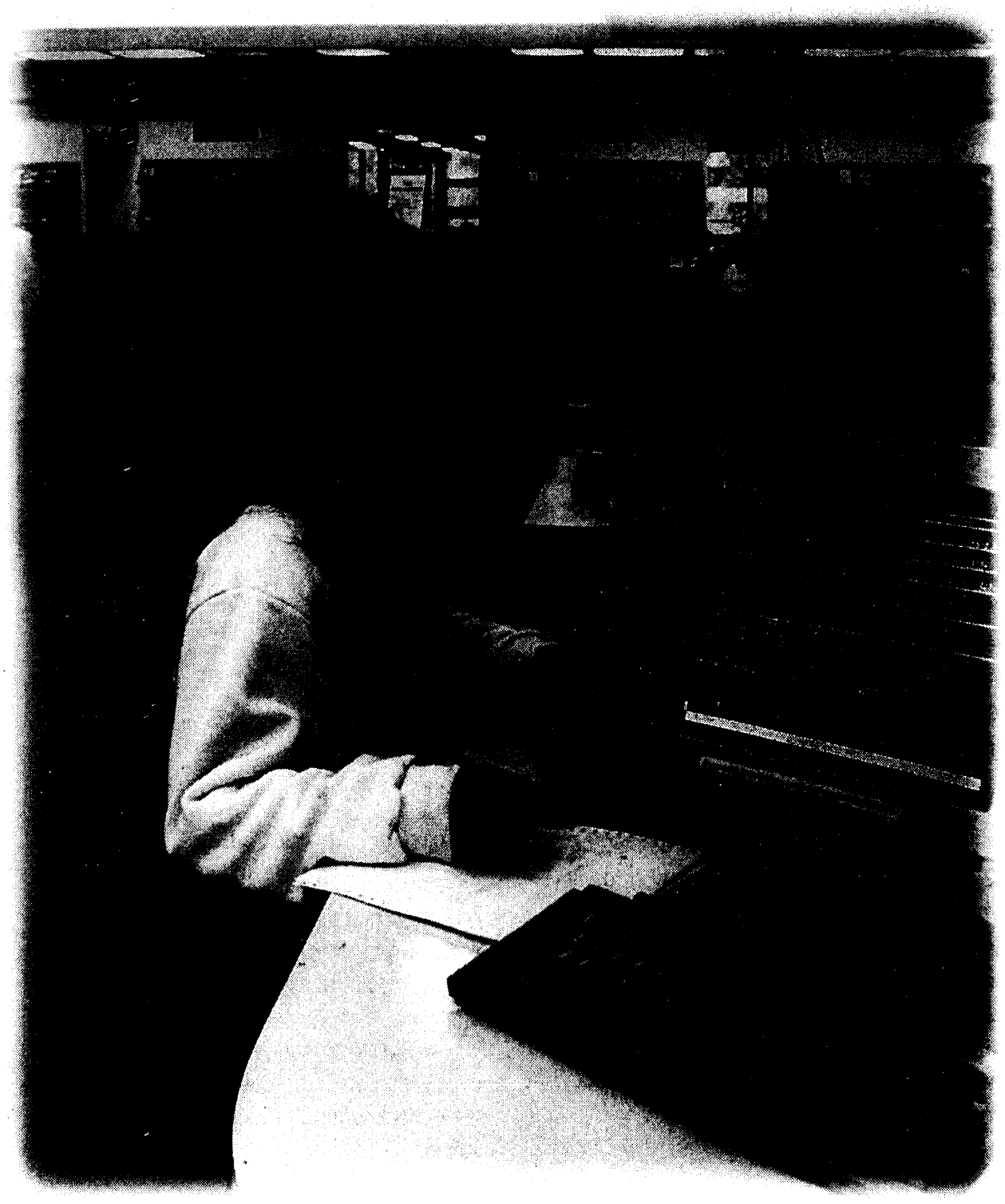
Exemption from Fees

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.

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. Exemption from this fee may be granted for surviving children of certain deceased California fire fighters or law enforcement officers. Students should check with the Student Financial Services Office for full ruling.

In addition, there is a campus activity fee of $40.50 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, and a $246 per year recreational facility fee.

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 approximately $3,086 per year. The educational fee may be reduced by one-half for students approved on part-time status.

Duplicate Degree Fee

Effective fall 1994, a duplicate degree fee of $2,000 per quarter is assessed to all students who have completed a first baccalaureate degree and enroll in either limited status or second baccalaureate status. Students who are currently enrolled in limited or second baccalaureate status and maintain continuous enrollment in their current status will be exempt from this fee.

In addition, exemptions from the duplicate degree fee are granted to students in the following categories:

- Dislocated workers certified by a state agency in accordance with Title 3 of the Federal Job Training Partnership Act.
- Displaced homemakers as defined in accordance with the Higher Education Act of 1965, as amended.
- Recipients of benefits under the Aid to Families with Dependent Children Program, the Supplemental Security Income or State Supplementary Program, or a general assistance program.
- Non-resident students assessed non-resident tuition which has not been waived.

To receive an exemption from the duplicate degree fee students must submit an Affidavit of Eligibility to the Registrar's Office by the end of the first week of instruction each quarter.

Miscellaneous Expenses, Fees, Fines, and Penalties

Books and supplies average about $200 per quarter. However, students should be aware of the following possible expenses:

Statement of Intent to Register fee (new under-graduate)	$100
Application fee (one campus)	40
Each additional campus	40
Duplicate Photo I.D. Card	10
Transcript of record	5
Verification of Student Data/Status	4
Late filing of announcement of candidacy for B.A.	3
Late enrollment	50
Return check collection	10
Late payment of fees (late registration)	50
Duplicate diploma	22

(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 are sold 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 in the Office of the Registrar or 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.

Academic Regulations

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. 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 State or Community College campuses may elect to satisfy their lower-division general-education and breadth requirements prior to transfer by completing the Intersegmental General Education Transfer Agreement. 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 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 in good standing may declare a double major.
   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 the 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); and Political Science 10, 100A, 100B, 100C, 102C, 102H, 104A, 110E A&B, 110J, 142A.
3. By presenting proof of having received a score of 500 or more on the CEEB Achievement Test 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 660 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 (619) 534-6177.

Senior Residence

Each candidate for the bachelor's degree must complete thirty-six 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 six courses on a well-defined subject, at

least three (twelve units) of which must be upper-division courses. 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 if the following two criteria are met:

1. The student has completed a *special* course of study within the department or program. The requirements for this special course of study shall be approved by CEP and published in the *General Catalog*.
2. No more than 20 percent of the seniors graduating from a department or program may be awarded departmental honors.

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 no more than 20 percent of graduating seniors: Anthropology, Biology, Chemistry, Chinese Studies, Classical Studies, Cognitive Science, Economics, Management Science, History, Judaic Studies, Linguistics, Literature, Muir Special Project, Music, Philosophy, Physics, Political Science, Psychology, Sociology, Theatre, and Urban Studies and Planning.

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, most prestigious honor society for the liberal arts and sciences in America. UCSD is one of only 240 four-year institutions granted chapters since the society was founded in 1776. In addition, there are fifty active PBK alumni associations in major cities around the country.

More than 200 current UCSD faculty and staff were initiated at their own undergraduate colleges. Each spring the campus chapter elects student members on the basis of high scholastic achievement and breadth of academic background. Minimal criteria for consideration include:

1. Enrollment at UCSD for five continuous quarters.
2. Successful completion of at least 160 quarter-units.
3. GPA of 3.65 or higher.
4. A strong grounding in the humanities (the equivalent of six courses in history, literature, or philosophy).

5. Completion of college-level courses in mathematics or quantitative science.
6. Proficiency in a foreign language.

In considering a student for membership, the reviewers consider the excellence of the 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 by letter, usually in late May, and initiation takes place in early June.

PHI BETA DELTA HONOR SOCIETY FOR INTERNATIONAL SCHOLARS

Phi Beta Delta is an honor society for international scholars. Its membership includes distinguished faculty who have achieved recognition in international endeavors such as teaching, administration, research, or services to international students and scholars; foreign students who have demonstrated high scholastic achievement at their institutions (graduate and upper-division students); and U.S. students who have demonstrated high scholastic achievement in pursuit of academic studies abroad or through participation in comparable international programs or experiences. Nominations for membership received from deans and department chairs are evaluated by a subcommittee. The chair of the Academic Senate Committee on Education Abroad Program and International Education was named acting president. Governance, nominations, and program committees were appointed, and the society now joins the ranks of other honor societies on the UCSD campus.

Application for Degree

Undergraduate seniors are required to file an Application for a Degree 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 $22 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.

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 Student Financial Services 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 Student Financial Services.

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.
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 received a grade of D, F, NP, or U shall not be used in grade-point calculations on a student's transcript.

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 197, 198, or 199. The 197 course is for individually arranged field studies. The 198 course is for directed group study. The 199 course is 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 ninety units of undergraduate study and must be in good academic standing (2.5 grade-point average or better).
3. A student may enroll for no more than a total of four units of 198 and 199 Special Studies courses in one term.
4. On the advice of the instructor(s) and the department chair(s) concerned, the provost of a student's college may authorize exceptions to the limitations listed in 2. and 3. above.
5. Only a grade of P or NP is to be assigned for a 197, 198, or 199 course.
6. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, a department may impose additional limitations on its supervised special studies courses.

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 the CEP Subcommittee on Undergraduate Courses 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 the CEP Subcommittee on Undergraduate Courses.

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 *Schedule of Classes* 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 *Schedule of Classes* for the term.

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 class meeting or examination will occur at a time at which his or her religious beliefs prohibit participation in the class or examination, the student must submit to the instructor, *no later than the end of the second week of instruction of the quarter,* a statement describing the nature of the religious conflict and specifying the days and times of

conflict together with documentation of the religious proscription and of the student's adherence to this religious belief. Upon determination that a conflict with the student's religious beliefs does exist, the instructor will attempt to provide an alternative, equitable examination procedure which does not create an undue hardship for the instructor.

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. Credit by examination is not available to students during summer sessions. 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 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 courses approved for more than a one-quarter sequence). 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 between the beginning of the fifth week of a quarter to the end of the ninth week of a quarter.).

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 courses attempted for a letter grade.

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 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, 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

the Telephone Student Services system (TeSS) or may 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. When a student drops a laboratory course after the second laboratory session, the registrar will assign a W to the student for the course. Only the registrar may assign a W.

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.
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.
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. 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 sheets.
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.

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 due in the last week of classes.

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 for missing a final exam or work due in the last week of classes. 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 their provost or graduate office to extend the Incomplete past one quarter. These petitions must have the prior approval of the *instructor and the department chair.* The petition must include the reasons for requesting the extension and *how* and *when* the I is to be completed. These petitions must be filed **before** the Incomplete grade lapses to an F, NP, or 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.

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.

Student Copy of Final Grades

At the end of each quarter students should call the Telephone Student Services system for grade information. Grades are usually available ten working days after the end of final examinations. Spring quarter grades will be mailed to all students' permanent addresses. Students should examine this copy of their transcript record for accuracy and should 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 $5 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 other- wise. 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

The principle of honesty must be upheld if the integrity of scholarship is to be maintained by an academic community. The university expects both faculty and students to honor this principle and in so doing protect the validity of university grading. This means that all academic work will be done by the student 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 encouraged.

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

The instructor should state the objectives and requirements of each course at the beginning of the term and clearly inform students in writing what kinds of aid and collaboration, if any, are permitted on graded assignments.

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 primary responsibility for maintaining the standards of academic honesty rests with two university authorities: the faculty and the administration. 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. The instructor shall determine the student's grade on the assignment and in the course as a whole. The recommended academic consequence of a serious breach of academic honesty is failure in the course, although less serious consequences may be incurred in less serious circumstances. The dean of the undergraduate student's college shall impose an administrative penalty. The assistant dean of Graduate Studies shall impose administrative penalties for graduate students in consultation with the instructor and the department. [Hereinafter the college dean and the assistant dean of Graduate Studies shall be referred to as the "appropriate dean."] Under normal circumstances, the recommended minimum administrative penalties are probation for the first offense and suspension or dismissal for a subsequent offense. The transcript of a student who is dismissed for academic dishonesty shall bear a notation that readmission is contingent upon approval from the Chancellor.

Procedures for Disposition of Cases of Academic Dishonesty

The instructor may contact any of the following people for advice on how to proceed or for clarification of the appropriate policy: the student conduct coordinator, the assistant dean of Graduate Studies, the college dean, or the assistant to the vice chancellor for Academic Affairs. The procedure for disposition of cases of academic dishonesty is divided into three phases:

A. *The Initial Phase*: When an instructor has reason to believe that a student has committed a dishonest act in completing an assignment, he or she should proceed in one of two ways: (1) Call the student to a meeting to discuss the charges, the evidence, and the proposed academic consequence. Unless the instructor decides that there is no evidence for academic dishonesty, the instructor must inform the appropriate dean of the charges. The dean shall then call the student to a meeting to discuss the case and the proposed administrative penalty. (2) Meet with the student and the appropriate dean together to present the evidence and to discuss the charges and the proposed academic consequence and administrative penalty. In this case, the instructor will contact the dean and the dean will, in turn, contact the student to arrange for a meeting of the three parties. Following steps (1) or (2), the instructor will confer with the dean to decide whether to proceed with the charge. The instructor may drop the charge, but the dean may not dismiss the charge without the instructor's consent. If the instructor and the dean do not agree on whether there is sufficient evidence to proceed, the dean should communicate his or her opinion to the chair of the relevant department. The instructor shall consult with the department chair before deciding whether to proceed.

If the decision is to proceed, the student shall be notified of the charges in writing by the dean and informed of the procedures for processing cases of academic dishonesty under the UCSD Policy on Integrity of Scholarship. The dean shall also advise the student of his or her options and the availability of assistance from Student Legal Services.

The student shall have ten (10) calendar days following notification by the dean to decide whether: (a) to accept the charge of academic dishonesty and the proposed academic consequences and administrative penalties, (b) to deny the charge of dishonesty and to proceed to a formal hearing as provided in paragraph B, or (c) to accept the charge of dishonesty but to appeal the proposed actions as provided in paragraph D. Unless the student informs the dean and the instructor otherwise within this ten-calendar-day period, he or she shall be presumed to have taken decision (a). If decision (a) is taken, a record of the academic consequences and administrative penalties imposed shall be maintained in the office of the appropriate dean. A copy of the final disposition of the case shall be sent to the chairperson of the department in which the violation occurred.

B. *The Hearing Phase*: If the student denies having committed the alleged act of academic dishonesty, he or she must submit a written request for a formal hearing to the appropriate dean within ten (10) calendar days of being notified of the charges. The dean shall refer the case to the student conduct coordinator (SCC), who within thirty (30) calendar days will schedule a formal hearing of the case by the Academic Dishonesty Hearing Board ("hearing board"). The SCC will provide at least ten (10) days notice to the student and the instructor of the time and location of the hearing. The SCC will also be available to advise the instructor of the procedures and options for presentation of the case.

The 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.

The hearing board shall hold a formal hearing and decide on the basis of a preponderance of the evidence whether the student did engage in academic dishonesty. In cases where the hearing board deems that expert advice is essential to a judgment on the merits of the case, such as suspected dishonesty in research, 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) calendar days from the date the hearing is completed, the presiding officer shall forward the hearing board's findings with explanations to the appropriate dean, with copies to the department chair, the instructor, and the accused student.

Within five (5) calendar days after receipt of the notice of the hearing board's final judgment in the case, the appropriate dean shall inform the student in writing of the findings of the committee and, if academic dishonesty is upheld, the administrative penalties to be imposed.

If the hearing board finds the evidence insufficient to sustain the charge of academic dishonesty, the dean and the instructor shall dismiss the matter without further action against the student, who shall be permitted to complete the course without prejudice or withdraw from it. If the student withdraws from the course, it shall not be listed on his or her transcript.

C. *The Appeals Phase*: If the hearing board sustains the charge of academic dishonesty, an undergraduate student may appeal that judgment in writing to the appropriate college provost within fifteen (15) calendar days from the date of the notice from the dean. A graduate student or IA shall submit the appeal to the dean of Graduate Studies.

The basis for appeal of the hearing board's judgment shall be: (a) 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 (b) that there exists newly discovered important evidence which 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.

D. *Modification of Academic Action and/or Administrative Penalty*: Within five (5) calendar days of receipt of the dean's letter, the student may appeal the instructor's determination of the academic action, and/or the dean's administrative penalty, as provided below.

Request for Modification of Academic Action: A request for review of the academic action taken under paragraph A 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 dean's administrative penalty under the provisions of paragraphs A or C shall be directed by an undergraduate student to the provost of his or her college, or by a graduate student or IA to the dean of Graduate Studies.

OTHER POLICY

While the case is pending, the student may not drop the course in which he or she is accused of dishonesty. If the case has not been adjudicated before the end of the quarter, the instructor shall not assign a grade in the course, but shall put a faculty hold in the memoranda column of the grade report, and the case may be continued into the next regular academic quarter.

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 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 the Vice Chancellor for Student Affairs or the Office of Dean of Graduate Studies, depending on the registration status of the student. The student's transcript shall bear the entry "Dismissed, readmission subject to the Chancellor's approval."

If a case of suspected academic dishonesty is also the subject of an administrative inquiry under the Policy on Integrity of Research, then the vice chancellor of Academic Affairs, in consultation with the hearing board, may make such modifications in procedure as are necessary to coordinate the two inquiries.

The appropriate dean can extend any timelines in this 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 Registrar. 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.

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; spring semester, July 1–31.

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.

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.

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 listed above for an intercampus transfer (ICT). The ICV application is subject to approval of the host campus.

A nonrefundable fee of $40 is charged for each ICV application.

Absence/Readmission to the University

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.

Undergraduates 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.

Undergraduate students in good academic standing who are absent for **two quarters** are automatically readmitted to UCSD.

Undergraduate students in good academic standing who were absent for **three quarters or more**, and who have been readmitted, must consult with a college academic adviser before enrollment. Students must adhere to the graduation requirements in effect at the time of readmission or those subsequently established.

Students who were on probation or subject to dismissal the last quarter of attendance at UCSD, but were not dismissed, must consult with an academic adviser 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

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.

New students receiving Title IV federal financial aid, who withdraw during their first quarter at UCSD, will receive a pro rata refund if they withdraw by the end of the sixth week of the quarter.

Graduate Studies

At the University of California, San Diego all programs leading to master's degrees and the doctor of philosophy degree 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.

Graduate study involves more than the accumulation of credits. Although certain formal requirements exist, a plan of study cannot be programmed in advance simply by listing courses to be taken and by indicating the time to be devoted to research. The Ph.D. and most master's degrees are the culmination of creative effort; they 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.

From its beginning, UCSD was determined to offer intellectual opportunities not elsewhere available. Much of the training it offers takes place outside the classroom–not only in seminars but in independent research and in tutorial work. In addition to the permanent faculty, there are many visitors from other universities; there are opportunities to study at other campuses of the University of California; and there is frequent association between members of the university and those individuals who have come here to work within the research institutes at the UCSD campus. 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 and the Scripps Research Institute have enhanced the area's reputation.

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 leading to degrees other than the M.A., M.S., M.F.A., or Ph.D. These courses may not be used to satisfy minimum graduate course requirements for degrees other than the M.P.I.A. 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 grading standards, and residency requirements are met.

The Office of Graduate Studies and Research

The Office of Graduate Studies and Research is administered by a dean appointed by the president of the university on recommendation of the chancellor. The dean of Graduate Studies and Research 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 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 student representatives from graduate programs on the campus. 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, and the School of Medicine–in academic, administrative, campus, and university matters. The GSA Council, composed of four 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.

Graduate Student Affirmative Action

The University of California, San Diego actively recruits and admits qualified students to graduate programs from groups underrepresented as a result of economic, social, or other inequities.

The Graduate Student Affirmative Action Program provides an array of counseling and advocacy services to assist U.S. citizens and permanent residents from underrepresented groups in applying, receiving financial support, and successfully completing graduate degree programs.

Ethnic minority students and students with disabilities in graduate programs in all fields, and women students in engineering and the sciences are eligible for awards through the San Diego and Cota-Robles Fellowship Program. Fellows receive a stipend plus tuition and/or fees for at least two years. Integral to the fellowship experience, fellows are assigned a faculty mentor in their major department to assist with academic and research goals.

Fellows making good progress are eligible for departmental financial support for subsequent years usually in the form of teaching, research, and language assistantships.

For assistance and further information about special opportunities for ethnic minorities; for women in science, engineering, and mathematics; and for physically handicapped individuals, contact the graduate student affirmative action officer, Office of Graduate Studies and Research, 518 ERC, (619) 534-2770 or (619) 534-3555.

GRADUATE DEGREES OFFERED: 1996–97

Anthropology	Ph.D..
Bioengineering	M.S., Ph.D
Biology	Ph.D.
Biology (Joint doctoral degree with San Diego State University)	Ph.D.
Biomedical Sciences	Ph.D.*
Chemistry	Ph.D.*
(Biochemistry)	Ph.D.*
Chemistry (Joint doctoral degree with San Diego State University)	Ph.D.
Clinical Psychology (Joint doctoral degree with San Diego State University)	Ph.D.
Cognitive Science	Ph.D.*
Communication	Ph.D.*
Comparative Studies in Language, Society, and Culture	Ph.D.§
Computer Science	M.S., Ph.D.
(Advanced Manufacturing)	M.S.
(Computer Engineering)	M.S., Ph.D.
Earth Sciences	Ph.D.*
Economics	Ph.D.*
Electrical Engineering	
(Advanced Manufacturing)	M.S.
(Applied Ocean Science)	M.S., Ph.D.
(Applied Physics)	M.S., Ph.D.
(Computer Engineering)	M.S., Ph.D.
(Communication Theory and Systems)	M.S., Ph.D.
(Electronic Circuits and Systems)	M.S., Ph.D.
(Intelligence Systems, Robotics and Control)	M.S., Ph.D.
(Photonics)	M.S., Ph.D.
Engineering Sciences	
(Advanced Manufacturing)	M.S.
(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.
(Structural Engineering)	M.S., Ph.D.
Engineering Sciences (Applied Mechanics) (Joint doctoral degree 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.
International Affairs	Ph.D.
Language and Communicative Disorders (Joint doctoral degree with San Diego State University)	Ph.D.**
Latin American Studies	M.A.
Linguistics	Ph.D.*
Literature	Ph.D.
Comparative	M.A.
English and American	M.A.
French	M.A.
German	M.A.
Spanish	M.A.
Marine Biology	Ph.D.*
Materials Science	M.S., Ph.D.
Mathematics	M.A., Ph.D.
Mathematics (Applied)	M.A.
Statistics	M.S.
Mathematics and Science Education (Joint doctoral degree 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.
(Biophysics)	Ph.D.
Political Science	Ph.D.*
Psychology	Ph.D.*
Public Health (Epidemiology) (Joint doctoral degree with San Diego State University)	Ph.D.
Sociology	Ph.D.*
Teaching and Learning (Curriculum Design)	M.A.
Theatre	M.F.A., 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.
**Pending approval
§ Students who have completed some graduate study at UCSD and have been admitted to a doctoral program may apply for this interdisciplinary program.

For additional information on students with disabilities, see "Disabled Student Services."

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 résumé writing, job search strategies, and non-academic employment options. The Career Services Center also houses a career reference library containing information on employers, job listings, salaries, sample résumés, and publications pertinent to graduate students' career issues. For more information, see the "Career Services" section of this catalog or visit the Career Services Office.

Requirements for

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 the master of fine arts, master of Pacific international affairs, master of arts, 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.")

Courses in the 400 series are used 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").

The Master of Arts and Master of Science Degrees

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.

Programs of Study

PLAN I: THESIS PLAN

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.

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 can-

didate for a master of arts or master of science degree on the San Diego campus.

PLAN II: COMPREHENSIVE EXAMINATION PLAN

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.

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 department concerned 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 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.

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 other institutions.

Course work approved for transfer credit will not be included in calculating a student's grade-point average, regardless of the source.

The Master of Fine Arts Degree

The master of fine arts degree is offered 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.

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 theater, 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.")

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.

[redacted]

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.

[redacted]

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.

[redacted]

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 should 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.

Ph.D. 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 Ph.D. degree:

(1) the registered time by which a student must advance to Ph.D. 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 Ph.D. 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 Ph.D. 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, nondegree, 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. Pre-candidacy 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 the doctor of musical arts degree and doctor of philosophy 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.

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 two weeks prior to a scheduled qualifying examination, the department arranges for the appointment of the doctoral committee. 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; 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 in writing 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 for the Degree of Doctor of Philosophy. 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 Degree of Doctor of Philosophy 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 doctor of philosophy degree. All dissertations and theses submitted in partial satisfaction of Ph.D. or master's degree requirements shall be catalogued and shelved in the university library and 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 before the master's degree, or 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 final signatures have been obtained on the final report.

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 Applied Mechanics and Engineering Sciences, 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, biology, biophysics, chemistry, clinical psychology, molecular pathology, neurosciences, pharmacology, physics, physiology, psychology, public health (epidemiology), 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 Ph.D. degree. At UCSD, joint doctoral programs in biology, chemistry, clinical psychology, language and communicative disorders (pending approval), engineering sciences (applied mechanics), mathematics and science education, and public health (epidemiology) are currently offered in conjunction with San Diego State University. Applicants interested in these joint programs should consult the Departments of Biology, Chemistry and Biochemistry, Communicative Disorders, Mechanical Engineering, Psychology; 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.

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 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 obtainable 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, and then present evidence of fee payment as directed by 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" on page 00 of 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. **Coursework 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. Teaching assistantships are available occasionally at some of the overseas campuses.

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. In addition, the Programs Abroad Office also offers information and advisory services to graduate and undergraduate students inter-

ested 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 on-line by accessing International Education options on UCSD's InfoPath under Academic Resources (http://www.infopath@ucsd.edu/campus/department/academic/index.html).

Postdoctoral Study

Postdoctoral trainees, scholars, and medical fellows play a major role in UCSD's teaching and research programs. All interested candidates should make advance arrangements with the relevant 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 forwarded to the Office of Graduate Studies and Research for approval and is eligible for a UCSD academic photo identification card. When a scholar has completed a period of postdoctoral study, the department at UCSD may request a Certificate of Postdoctoral Study from the Office of Graduate Studies and Research. This certificate will indicate the area of study and the dates enrolled.

Health Net, a prepaid health plan, and DentiCare, a prepaid dental plan, are available for purchase by UCSD postdoctoral scholars. All scholars are required to enroll in Health Net unless they have adequate coverage through another health insurance program. Information on Health Net, DentiCare, and enrollment procedures may be obtained from administrative offices of departments, groups, schools, or organized research units.

Fees for the 1996–97 academic year are expected to increase slightly. The following schedule of fees is anticipated for the 1996–97 academic year:

FEES PER QUARTER*

	Resident	Non-Resident
Tuition	$	$2,797.00
Registration	238.00	238.00
Educational	1,080.00	1,080.00
Student Center	37.50	37.50
Recreational Facilities	82.00	82.00
Graduate Student Assoc.	5.00	5.00
Health Insurance	235.00	235.00
Totals	$1,629.50**	$4,426.50**

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
Removal of Grade "I"	5
Advancement to Candidacy for Ph.D.	50
Transcript of Record	5
Late payment of fees (Late registration)	50
Late filing of enrollment cards (including Preferred-Program Request)	50
Returned check collection	10
Filing fee	119.00

***Subject to change without notice.** 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.

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." 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.

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 Center provides primary care without charge during the academic year for all students who pay the university registration fee. These services are also available during summer for a modest fee.

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.

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. GSHIP is not available for dependents of graduate students.

REFUNDS

Once registration fees have been paid, a refund of the insurance premium due to Leave of Absence or Withdrawal may be possible up to the end of the second week of classes.

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 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, and nonresident tuition, 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 the Registrar. 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 $5 for each copy. Transcripts must be requested several days in advance of date needed.

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, limited to students from underrepresented groups, currently provides a minimum stipend of $750 per month plus resident fees and nonresident tuition, if applicable. These awards are usually given for two years. Academic departments are responsible for two additional years of support for Ph.D. students awarded San Diego Fellowships.

Seven additional Cota-Robles fellowships for the top incoming students from underrepresented groups are available from monies provided by the Office of the President. These awards provide an annual stipend of $12,500, resident fees and nonresident tuition, if applicable. The fellowship is given for a period of four years, and the student is eligible for additional funding in the dissertation year.

MINORITY BIOMEDICAL RESEARCH SUPPORT (MBRS): UCSD is a recipient of funding from the National Institutes of Health (NIH). The MBRS program provides graduate student support to a limited number of gradute students in the programs of biomedical sciences, chemistry and biochemistry, and neurosciences. Support includes fees, nonresident tuition (if applicable), a stipend, and travel funds for professional conferences.

All other fellowship stipends are established by the departments, group, or school and may vary in tenure from one to twelve months and in amount from $100 to $1,000 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. 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 and Graduate Student Health Insurance.

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 for Ph.D. and Master's Students.* Funds used for tuition, fees, books, and course-related expenses are *not* taxable income. Stipends 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.* Not taxable.
5. *Awards to Postdocs and Non-Degree Graduate Students.* Tuition and fee awards, stipends, and other compensation are 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 are exempt from FICA if the students have appointments that sum to 50 percent time or less in any pay period AND if they are registered for a minimum of 12 units each quarter (including summer) during the appointment period. Students 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. Obtain application materials from academic department, group, or school offices. Only one application form is needed to apply for graduate admission and for any of the following: fellowships, traineeships, scholarships, and assistantships (teaching, language, or research).

In order for an applicant to be considered for a fellowship, traineeship, or graduate scholarship for the ensuing academic year, an application for admission with financial aid and all supporting materials must be received by the deadline as listed in the Application for Graduate Admission. No assurance can be given that applications can be processed after stated deadlines. Applications for assistantships may be accepted after the deadline, but many departments offer assistantships at the same time they consider applications for fellowships. Therefore, applicants for these appointments are strongly urged to submit their applications 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 Application 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). Within these limits, students can be appointed as teaching assistants for a maximum of six years. Absolutely no exceptions beyond the sixth year are permitted by university-wide policy.

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 home page (http://www-ogsr.ucsd.edu), through the reference departments of other large libraries or the fellowship adviser in the Office of Graduate Studies and Research, 518 Eleanor Roosevelt College. Most application deadlines occur in the fall or early winter. Among the many organizations which award fellowships to students at UCSD are the Alcohol, Drug Abuse and Mental Health Administration; Department of Defense; the Ford Foundation; the Hertz Foundation; the Hughes Aircraft Company; IBM; Institute of International Education; the

National Aeronautics and Space Administration; the National Science Foundation; the Pharmaceutical Manufacturers Association Foundation; the Social Science Research Council; the United States Information Agency; and, the Woodrow Wilson National Fellowship Foundation.

California residents may apply for a California State Graduate Fellowship through the California Student Aid Commission to assist in payment of the university registration fee, the student center fee, and the educational fee. The deadline for application is at the beginning of March, and application materials and additional information can be obtained in mid-December from the Student Financial Services Office.

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 at the Office of Graduate Studies and Research, and the Office of Judicial Affairs.

Student Appeals

Because department chairs–in consultation with faculty colleagues–have primary responsibility for maintaining the excellence of graduate programs, and because faculty within a department are in the best position to judge their students' academic performance, graduate student appeals of an academic nature (i.e., course grades, examination results) should first be made to the individual faculty member involved, and, if necessary, the department chair.

Graduate students who wish to appeal actions of individual faculty, departments, or administrators relating to their academic program or financial support may do so if:

1. They feel that due process was not followed in arriving at a decision which resulted in disqualification.
2. They feel that personal prejudice affected the academic judgment rendered.

Students wishing to appeal a decision on these grounds should address such appeals to the dean of Graduate Studies.

In resolving student appeals, the dean of Graduate Studies may seek a review and recommendation by the Graduate Council.

Graduate students may appeal a course grade or Ph.D. or master's qualifying or final exam 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 this catalog.

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 filed with 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 must be taken on an S/U basis, and the 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. Advancing to candidacy for a graduate degree.
4. Going on leave of absence.
5. 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.

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.

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.

Final Grades

An unofficial copy of the complete transcript is sent to each student at the end of every spring quarter. 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 degrees is not permitted. A professional degree is not regarded as a duplication of an academic degree.

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. 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 must 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

Applicants for admission who wish to be considered for a fellowship, traineeship, graduate scholarship, or assistantship should refer to "Financial Assistance–Application Procedures." Most programs have an application deadline of January 15 for fall admissions. A few programs accept applications for winter and spring admissions. For specific deadlines refer to the Application for Graduate Admission or contact the specific program office.

Applicants need not have completed their undergraduate programs in order to apply. However, when an applicant's grades or preparation appear to be marginal, the department, group, school, or the Office of Graduate Studies and Research may defer action upon an application until a supplementary record or evidence of the receipt of a degree becomes available.

How to Apply

Applicants must complete an Application for Graduate Admission and submit it, together with a nonrefundable application fee of $40, to the Office of Graduate Admissions. **Applications submitted without the application fee will not be processed.** An application and additional program and application information are obtained from the graduate office of the program to which the applicant is applying. To obtain the application, call or write the graduate office of the specific program to which you are applying. Telephone numbers and campus addresses are listed with the department information in this catalog, and the street address for all departments is 9500 Gilman Drive, La Jolla, California 92093. The Graduate Admission Application includes application for a fellowship, traineeship, scholarship, or assistantship. Detailed instructions as to how to complete the application appear within the application booklet. The documents which are required in support of an application for graduate admission are listed below.

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 is used as the applicant's identification number in the UCSD graduate student record-keeping system. 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 forwarded directly to the applicant's prospective major department, group, or school.

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 are enclosed in the application packet for this purpose. 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.

SPECIAL NOTE TO FOREIGN 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 **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.** The GRE is administered three times a year in the United States and in 133 other countries. Applicants may also schedule individual computer testing dates. Consult the GRE Information & Registration Bulletin for further information. In addition, several administrative service tests are given each year in major U.S. cities (dates change). Applications may be obtained from the Educational Testing Service, Box CN 6000, Princeton, New Jersey 08541-6000.

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 received by the appropriate department at UCSD.

LETTERS OF RECOMMENDATION

Applicants should arrange to have three letters of recommendation forwarded directly to their prospective major department, group, or school. (Recommendation forms are included in the application booklet.) 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.

FOREIGN 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. A Foreign 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.

National Examination Information

There are a variety of nationally 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 students are listed here.

GRADUATE SCHOOL FOREIGN LANGUAGE TESTING PROGRAM (GSFLT)

Address: Educational Testing Service, Box 519, Princeton, New Jersey 08541.

Purpose: To measure ability to read and understand literature in French, German, Russian, or Spanish in order to meet foreign language requirements for advanced degrees.

Application: Information and forms are available from San Diego State University Testing Office, Student Services Building, Room 2549, 5300 Campanile Drive, San Diego, California 92182-0577. Telephone: (619) 594-5216.

Tickets are available the first of the month prior to the month in which the examination is given. Students should arrange to pick up a ticket of admission at the testing office a few days before the scheduled examination. It is impossible to do this the same morning as the test.

Examination Schedule: Four times a year (dates change each year).

Fee: $20*

*Subject to change

TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL)

All foreign 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.

Applicants who are admitted with a total TOEFL score of less than 550 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 from TOEFL Services, P.O. Box 6151, Princeton, NJ 08541-6151, or from United States embassies, consulates, and related centers; and the San Diego State University Testing Office, Student Services Building, Room 2549, 5300 Campanile Drive, San Diego, California 92182-0577. Telephone: (619) 594-5216.

Applications must be submitted to TOEFL Services at least *six weeks* prior to the scheduled examination date.

Examination Schedule: One day each month (dates change each year) in approximately 135 countries.

Fee: Consult the current TOEFL booklet for fees.

TEST OF SPOKEN ENGLISH (TSE)

Address: Educational Testing Service, Box 6157, Princeton, New Jersey 08541-6157.

Purpose: To help foreign students provide a reliable measure of proficiency in spoken English. This test is highly recommended for foreign applicants for teaching assistantships.

Application: Same as TOEFL above.

Examination Schedule: Nine times a year (dates change each year) in approximately 135 countries.

Fee: Consult the current testing booklet for fees.

Foreign applicants who wish to be considered for a teaching assistantship are urged to submit scores on the Test of Spoken English (TSE), which is given at TOEFL test centers throughout the world (approximately 185 countries), one day each month (dates change each year).

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, 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, group, or school 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, group, or school offices approximately two weeks before the opening of the quarter (see "Academic Calendar").

Reapplication

Applicants who are admitted and fail 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 a 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 request a 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 "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.**

Priority Enrollment

Continuing Students

Continuing graduate students may enroll any time during Priority Enrollment by telephone. A Personal Access Code (PAC) number is issued to graduate students by the Office of the Registrar. These PAC numbers will be released by the department after required advising has taken place, or directly to the student if adviser approval is unnecessary. Students who do not use telephone registration may complete Add/Drop Cards and file them with the Office of the Registrar any time during enrollment periods.

Complete instructions for enrolling by telephone (T-REG) or Add/Drop Cards can be found in the quarterly Schedule of Classes.

Confirmation of classes is immediate by telephone. Students must officially withdraw from a course to avoid receiving a failing grade.

New Students

New students enroll just prior to the start of instruction during enrollment periods. New students may enroll by telephone after receiving adviser approval, or may complete Add/Drop Cards and file them with the Office of the Registrar.

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; if the Registration Receipt is lost, a duplicate may be obtained from the Cashier's Office (see "Fees").

The validation sticker is removed from the Student Photo-Identification Card when students withdraw or go on leave of absence.

UCSD graduate students on campus continuing their graduate studies or research during the summer months may request a Summer Validation Sticker from their major department, group, or school office.

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 (619) 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 or associates will have health insurance and partial fee remission credited to their account prior to the beginning of the quarter. Readers and tutors appointed 25 percent time (110 hours) or more are issued refunds for health insurance and 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 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 considered 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.**

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.

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 must obtain approval of their graduate adviser or department. See *Schedule of Classes,* "Changes of Programs."

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 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 coursework 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.

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 for one additional quarter 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.

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 the Registrar.

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.

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; 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.

Campus Services and Facilities

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 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, (619) 534-3490

John Muir College, 2126 H&SS, Mail Code 0106, (619) 534-3580

Thurgood Marshall College, Admin. Building, Mail Code 0509, (619) 534-4110

Earl Warren College, Literature Building, Mail Code 0422, (619) 534-4350

Eleanor Roosevelt College, 412 University Center, Mail Code 0069, (619) 534-9864

Specifically, the college academic advisers conduct academic orientation/registration 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

Applied Physics and Mathematics Building, first floor
Mail code 0110
(619) 534-4050

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 and ordinary terminals, there are nearly 600 workstations of various types available across campus. These include Macintosh, PC, and UNIX workstations (Sun, Hewlett-Packard, Silicon Graphics) located in public areas, computer labs, and libraries.

A wide variety of software is available on various platforms, including general purpose word-processing and spread sheet applications; compilers and program development tools; special purpose packages for electronic design, mechanical engineering, animation, image analysis, 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 and terminal rooms to help students use the facilities. These assistants complement other forms of support such as guidance from instructors and teaching assistants, and on-line documentation.

The Open Computing Environment (OCE) is a service model available to students in many academic disciplines. OCE provides both instructional and extra-curricular 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, campus dial-in modems, and connections to global networks. To facilitate electronic mail communications within and beyond the boundaries of the campus, Network Operations maintains a registry of campus members and affiliates.

To use campus dial-in lines, UCSD users will need a network security username and password. Students may have these issued automatically when they obtain an ACS account; others may register by bringing a picture ID to the Office of Network Operations in room 1307 AP&M.

Network Operations can assist you in locating correspondents via email, connecting your computer to make use of Internet services, accessing Usenet electronic news, conducting research and information searches over the Internet, and discovering and accessing other Internet and local area network-based services.

Network Operations provides a large number of handouts on using network services such as electronic mail, news, dial-ins, and mailing lists. These handouts can be obtained outside 1307 AP&M or by request to (619) 534-1857.

Network Operations User Support is located in 1307 AP&M. The Network Operations general help line is (619) 534-1857.

Software Licensing and Distribution Services

In addition to its other functions, ACS is one of several departments on campus that assists in distributing software and administering agreements to make software available to the campus community at reduced costs. Look on InfoPath for an overview of UCSD software resources.

Other ACS Functions

Two ACS systems, one Unix and one VMS, are available on a fee-for-service (recharge) basis. These systems are used primarily by UCSD academic departments for administrative and grant funded research purposes. ACS also has a service to distribute campus administrative data to academic departments.

Education Abroad Program (EAP)

International Center (corner of Gilman Drive and Library Walk)
Mail code 0018
(619) 534-1123

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.

Students interested in studying abroad should also see the entry on the Programs Abroad Office, below.

International Scholar Adviser

International Center (corner of Gilman Drive and Library Walk)
Mail code 0018
(619) 534-3730

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
(619) 534-3730

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
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 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.

The Academic Transition Program

The Academic Transition Program coordinates a residential Summer Bridge Program, and professional and academic transition counseling for freshmen who are members of ethnic groups underrepresented 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.

During the Summer Bridge Program, students attend courses in mathematics, science, and a Contemporary Issues I course. The Contemporary Issues I course promotes an understanding of the history and role of higher education in the United States, and assists students in the development of critical thinking skills. Additionally, the course provides a theoretical framework of factors which affect student retention and development.

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 individual tutoring, small-group study sessions, and workshops for lower-division mathematics, physics, biology, chemistry, engineering, economics, and computer science courses.

The Writing Program

The Writing Program offers students an opportunity to improve their writing skills and strategies for a range of different writing situations—the essay exam, the lab report, term and research papers—and across disciplines, from science to literature. One-to-one writing conferences are available by appointment for all UCSD students. These conferences stress pre-writing preparation, revision, and editing strategies. Small-group sessions address special needs, for example, research writing and editing.

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 increase the retention 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.

The Research and Evaluation Program

Administered jointly by the Office of the Assistant Vice Chancellor for Academic Services 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
(619) 534-3730

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
(619) 534-1123

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. 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 Building
Mail code 0505
(619) 534-5000 (general inquiries)
(619) 534-5100 or consult@sdsc.edu
(SDSC consultants)
http://www.sdsc.edu

The San Diego Supercomputer Center (SDSC) is a national laboratory for computational science and engineering. Its mission is to advance scientific research through computation, serve as a national focal point for development of key high-performance computational technologies, and enhance U.S. economic competitiveness. With a staff of more than 125 scientists, software developers, and research support personnel, the center serves more than 5,100 researchers from 240 academic, government, and industrial institutions. These researchers have investigated new scientific problems and paradigms of computing, founded new centers of research, taught hundreds of courses, and started spin-off companies.

More specifically, SDSC

- Conducts research in scientific applications and enabling computational technologies.
- Provides access to high-performance computing and visualization resources.
- Develops tools to integrate computing resources and provides support to enhance researchers' productivity.
- Offers educational programs and develops undergraduate/K–12 curricula to spread expertise in using high-performance computational tools.
- Integrates computational technology into commercial research, design, and manufacturing processes through partnerships with industry.

In operation since 1986, SDSC is located at UCSD (on the north end of campus just south of RIMAC and east of IR/PS) and is administered by General Atomics through a cooperative agreement with the National Science Foundation. It receives policy guidance from a consortium of 27 leading universities and research institutions, including all campuses of the University of California system. It has an annual budget of $25M. Approximately sixty percent of this funding comes from the National Science Foundation; the remaining forty percent comes from the Advanced Research Projects Agency, the National Institutes of Health, the State and University of California, and industrial partners.

RESEARCH ACTIVITIES

SDSC supports computational work across a broad spectrum of sciences. SDSC's internal research staff activities focus on biology, chemistry, and environmental sciences, and developing the underlying computational technology. SDSC leverages the efforts of these researchers through collaborations with colleagues on campus and other local research institutions (particularly the Salk Institute for Biological Studies and The Scripps Research Institute), interaction through SDSC's senior fellows program (in which many UCSD professors participate), adjunct faculty appointments at UCSD and San Diego State University, and joint support (with UCSD) of postdoctoral positions. This creates a collaborative *community* that cuts across the domains of research, teaching, and infrastructure development and is moving researchers to scalable parallel architectures. In this environment, SDSC is a national focal point for major advances in biomedical and environmental sciences applications.

High-performance computing, biochemistry, and database research find a synergy in the areas of biomolecular modeling and rational drug design. SDSC is nurturing that synergy by leading protein engineering and drug design projects at UCSD and building essential infrastructure (databases, computational chemistry software tools, and new structural biology software) to address researchers' needs in a comprehensive fashion. A major collaboration in this area is the Computational Center for Macromolecular Structure, which teams SDSC, UCSD/Chemistry, and The Scripps Research Institute (TSRI) led by Susan S. Taylor (UCSD/Chemistry and SDSC senior fellow), Lynn Ten Eyck (SDSC and UCSD/Chemistry), and John Tainer (TSRI). This group is developing and distributing software to solve and analyze macromolecular structures.

Biomedical research activities at SDSC are highlighted in two major collaborations. One is the Collaboratory for Microscopic Digital Anatomy that will provide researchers network-based access to unique instrumentation for acquiring and manipulating images of biological structure. This project will revolutionize the way biological researchers interact with scientific instrumentation and serve as a prototype example for how researchers in other disciplines can make cost-effective network-based use of specialized research equipment. This collaboration teams SDSC with Mark Ellisman of the National Center for Microscopy and Imaging Research at San Diego (NCMIR) and colleagues at the UCSD Medical School, and a group headed by Don Greenberg of Cornell University and the National Science Foundation's Science and Technology Center in Computer Graphics and Scientific Visualization.

The second collaboration is the National Biomedical Computation Resource, a National Institutes of Health Research Resource. This resource is stimulating the use of parallel computing technologies in biomedicine. It is playing a leading role in the application of high-performance parallel computers to biomedical problems, developing new software, increasing the number of biomedical researchers with experience using parallel systems, and establishing a group of computational experts at SDSC in biomedical applications. Led by SDSC director Sid Karin, this collaboration includes researchers at SDSC, Biosym Technologies, TSRI, UCLA, and UCSD.

Chemists at SDSC are developing and applying methods to understand the structure, spectroscopy, and reactivity of molecules. Their topics include studying the structure and growth of larger structures such as diamond films and fullerene materials and how ozone is being depleted from the Antarctic and Arctic

polar stratosphere, developing methods using SDSC's parallel supercomputers to calculate accurate molecular properties, modeling geochemical systems, designing and synthesizing novel, highly strained carbon compounds, and studying charge-transfer processes in photochemical reactions (which are highly relevant to the understanding of fundamental biological processes).

In the area of environmental modeling, SDSC has launched a major initiative to develop organizing principles based on observed data to make ecology a predictive science. This initiative will demonstrate the efficacy of managing natural resources in a unique way by teaming scalable parallel computing and visualization technology, scientific expertise, and public policy making. The computational technology will provide the means for objective resource management as well as "post-mortem" assessment of policy effectiveness. The first project of this initiative is to develop 3D visual, analytical, and predictive models of San Diego Bay. These models will be based on biological, chemical, and physical data being collected by thirty monitoring programs; the data will be normalized and integrated in a centralized data repository that will be made publicly accessible over the Internet on SDSC's World Wide Web server.

Because researchers in all these areas continue to challenge the capabilities of even the most powerful computing systems, SDSC's research program includes a strong emphasis on developing the next-generation underlying computational technology to enable even more complex studies. This work includes plans to implement a distributed teraflops system with Caltech based on a gigabit-per-second communications link; ongoing work with Intel to stabilize and enhance the operating system for the Paragon parallel supercomputer; network engineering, analysis and modeling; development of archival storage systems to support the expected demands of petabyte archives; performance evaluation; tools development; and the implementation of a single authentication system for more secure access to all the resources of the national supercomputer centers.

COMPUTATIONAL RESOURCES

SDSC computational resources include

- CRAY C90 vector supercomputer, running the UNICOS operating system (the Cray Research version of UNIX). It has eight processors and a peak speed of 7.7 billion floating-point operations per second (gigaflops or Gflops). It features 2 Gbytes of main memory, 8 Gbytes of auxiliary memory, and 189 Gbytes of local high-speed disk storage.
- CRAY T3D parallel supercomputer. It has 128 processors and a peak speed of 19 Gflops. Each processor has access to 64 Mbytes of memory, and the system is configured with 62 Gbytes of disk. This system is attached to the C90, which serves as its front end, and shares access to its 251 Gbytes of high-speed disk.
- Intel Paragon parallel supercomputer, running OSF/1 (another UNIX variant). It has 400 processors (called "nodes") and a peak speed of 30 Gflops. Memory is allocated per node: 128 nodes have 32 Mbytes of memory each, and the rest have 16 Mbytes of memory each, giving the machine an aggregate memory of 8.25 Gbytes. This machine has 48 Gbytes of local disk storage.
- Thinking Machines CM-2, with 8,096 nodes. A research group at UCSD headed by Fran Berman, professor of Computer Science and Engineering and SDSC senior fellow, is using this machine to study heterogeneous application scheduling in a non-dedicated environment. This group is developing predictive performance models that take into account processor and communication network contention in a system consisting of two distinct machine types. The goal of this work is to facilitate other two-part heterogeneous systems and to begin considering more general heterogeneous scheduling issues.
- DEC Alpha farm, consisting of nine clustered workstations.
- UniTree, a 20-terabyte archival storage system accessible from all SDSC production systems.
- A recently upgraded visualization laboratory featuring Silicon Graphics workstations, a Fakespace boom head-mounted virtual reality device, a telemanufacturing facility for producing solid 3D models of geometric data sets, a variety of hardcopy and film output devices, and an audio/video suite for producing professional-quality videotapes of visualized research results.

ALLOCATIONS

Allocations for time on SDSC's CRAY C90, CRAY T3D, and Intel Paragon supercomputers are made to support research projects and class curricula. All proposed projects must be nonproprietary. Any U.S. researcher, postdoc, or educator, regardless of affiliation or funding source, is eligible to apply for a peer-reviewed allocation. Undergraduate and graduate students may obtain time through applications submitted by their advisors. To apply for time, you must submit an application (available from the SDSC consultants) at least sixty days prior to the quarter in which you want your allocation to begin (quarters begin January 1, April 1, July 1, and October 1; allocations are typically made for 12-month periods). For requests for up to fifty CRAY hours or up to 5,000 Paragon hours, applications can be submitted any time and are reviewed shortly after receipt. Allocations can also be obtained from block grants administered by UCSD (for engineering allocations, contact Greg Hidley, hidley@de.ucsd.edu; for other types, contact Marvin Goldberger, mgoldberger@ucsd.edu) and the Scripps Institution of Oceanography (Steve Constable, sconstab@ucsd.edu).

Accounts are also available on workstations in SDSC's VisLab. Any academic researcher, or graduate or undergraduate student may apply for one. To apply, fill out the SDSC Workstation Access Request form, which is available from the SDSC consultants. Each form is reviewed to ensure that the goals of the applicant are consistent with the mission of SDSC. This review process takes 2–4 weeks.

Researchers with access to SDSC's resources are supported by SDSC's consulting staff. The consultants are available by phone (619) 534-5100, e-mail (consult@sdsc.edu), and on a walk-in basis 8:00 a.m. – 5:00 p.m. Monday through Friday. Researchers and students with accounts are welcome to attend SDSC's periodic training workshops (contact the SDSC consultants for more information). Information about SDSC can be obtained by connecting to SDSC's World Wide Web server (http://www.sdsc.edu/), or contacting Ann Redelfs, External Relations, (619) 534-5032, redelfs@sdsc.edu.

ADDITIONAL OPPORTUNITIES FOR THE CAMPUS COMMUNITY

SDSC offers the following additional opportunities for UCSD professors, researchers, and students:

- Access to high-performance computers through UCSD classes—Many UCSD and Extension classes make use of the SDSC resources described above, providing a hands-on way to learn about high-performance computing. To take advantage of these resources, check particularly the class listings for Biology, Chemistry, Computer Science and Engineering, Electrical and Computer Engineering, and Applied Mechanics and Engineering Sciences.
- Research program for undergraduates—The National Science Foundation sponsors an ongoing program at SDSC, called Research Experiences for Undergraduates, that provides an opportunity for undergraduates to work on computational science research projects under the guidance of SDSC mentors and their campus advisors. Students can participate in a nine-week summer program or a part-time program during the academic year. You must apply for and be accepted into the program. Stipends are provided. For more information, contact Bob Leary, leary@sdsc.edu.
- Seminars—SDSC hosts a wide variety of seminars on topics of interest to the high-performance computing community. Most are open to the UCSD community.
- Internships—Through the academic internship program at UCSD, students can obtain work experience at SDSC for course credit. 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 Jayne Keller, (619) 534-5124, jaynek@sdsc.edu.
- Part-time and post-graduate employment—SDSC posts part-time and professional job openings at the UCSD Career Services Center. Typical part-time jobs are in programming, researcher support, technical writing, library assistance, computer operations, and reception work.
- Access to SDSC's library—SDSC maintains a professionally staffed library (room 308) with specialized information on all aspects of high-performance computing, including collections of relevant scientific and computational journals, proceedings from relevant conferences, and newsletters from other supercomputer centers. The library is open 8:00 a.m. – 5:00 p.m. Monday through Friday; visitors should first check in with the SDSC receptionist on the first floor. Anyone can come and use materials in the library, but only those with SDSC allocations may check materials out. For more information, contact Dick Ellis, (619) 534-5171, dellis@sdsc.edu.
- Tours—SDSC offers a 45-minute tour at 4:00 p.m. every Friday. Reservations are recommended and can be made by contacting the SDSC receptionist, (619) 534-5000, reception@sdsc.edu. Special-interest group tours can be arranged by contacting Sandy Davey, (619) 534-5026, daveys@sdsc.edu.

Extended Studies and Public Service

9600 North Torrey Pines Road
(on the UCSD campus north of Muir College)
Mail code 0176
(619) 534-3400
Fax: (619) 534-8527
Internet: http://www-esps.ucsd.edu

The Division of Extended Studies and Public Service is the key lifelong learning resource for the University of California, San Diego. The organization provides a rich and varied array of academic and community outreach programs designed to support a diverse constituency. The Division has classroom and administrative centers in La Jolla, downtown San Diego, and Rancho Bernardo. The Division provides advanced learning opportunities for adults, including courses, seminars, workshops, institutes, conferences, and study tours. Annual enrollment is approximately 45,000 in the various programs administered through UCSD Extension, the largest department of Extended Studies and Public Programs. Over 80 percent of UCSD Extension participants have a bachelor's degree.

With the exception of specific grant-funded programs, the division's programs are supported by course fees and receive no state funds.

UCSD Extension courses numbered 1 through 199 are structured in accordance with the requirements for regular campus courses and may be taken by UCSD students for elective credit.

For further information on the Division of Extended Studies and Public Programs, phone

(619) 534-0406 for a free catalog. Among the many programs in the division are:

CONTINUING PROFESSIONAL EDUCATION

Courses and certificate programs are offered in a wide range of fields, including microcomputer engineering, business management, hazardous materials management, legal assistant training, marketing management, computer systems programming, human resource management, urban planning, desktop publishing, TQM, U.S.-Mexican trade, emergency department nursing, alcohol studies, and fitness instruction. State-approved credential programs for educators, quarterly engineering colloquia, a career-planning program, and specializations in business, science, engineering, and computer science are also offered.

EXECUTIVE PROGRAMS

UCSD Extension offers a variety of programs to meet the needs of San Diego companies for astute, broadly educated managers equipped to deal with the dramatic financial, technological, and cultural changes in today's workplace.

Two such programs include the "Executive Program for Scientists and Engineers" (EPSE) and the "Leadership and Management Program for Scientists and Engineers" (LAMP). Both are accelerated, proficiency-based courses of study tailored to the scientist or engineer who holds, or is about to be promoted to, a significant management position. Participants are nominated to apply for the programs by their companies. Both programs were developed by an advisory committee of San Diego engineering executives. In addition, UCSD Extension sponsors major institutes and conferences featuring international experts.

ADVANCED TRAINING FOR EDUCATORS

State-approved credential programs for teachers offered by UCSD Extension include adult education, vocational education, special education, and pupil personnel services. There are two certificate programs in computers in education, plus a wide range of seminars and workshops in innovative teaching techniques and educational administration.

In addition, summer institutes for teachers allow the university to contribute to the education of our community's young people by enhancing the intellectual perspective of teachers. For example, the Program for Teacher Enhancement in Science and Technology (PTEST), funded by NSF, and Project COPE (Change on Planet Earth), co-sponsored with Scripps Insitution of Oceanography, bring selected teachers to the campus for seminars and courses taught by prominent UCSD faculty.

CONNECT: THE PROGRAM IN TECHNOLOGY AND ENTREPRENEURSHIP

Formed in the fall of 1985, CONNECT is designed to contribute to the realization of San Diego's high-technology potential. The program provides a context in which the leaders of high-tech businesses and service industries can exchange information, generate ideas, and develop resources. Among its many activities–including research, publications, forums that bring together the financial and technological communities, and contributions to the future expansion of high technology in San Diego–the program presents educational events designed to fulfill such objectives as helping researchers and entrepreneurs identify the commercial potential of their ideas and findings; creating opportunities for researchers to showcase their ideas to potential investors and venture capitalists; helping entrepreneurs improve their business planning, management, and financial skills; and creating a context for analysis and discussion of the critical public policy issues that affect the growth of high-tech enterprises. For further information phone (619) 534-6114.

UCSD ENVIRONMENTAL TRAINING CENTER

The UCSD Environmental Training Center provides a broad spectrum of environmental and safety training to working adults in the San Diego community, Southern California, and throughout the western United States. The center is the home of the EPA's Western Regional Lead Training Center. Courses are also offered in asbestos management, natural resources management, occupational health and safety, site assessment and remediation, hazardous materials management, fire protection, and air quality management. Students may earn professional certificates, specialized certificates, and certificates of completion for required regulatory training. For information call (800) 572-5323.

OSHA TRAINING INSTITUTE—PACIFIC COAST EDUCATION CENTER

The OSHA Training Institute offers selected OSHA-approved safety and health training courses to the private sector and federal agencies, using curricula provided by the U.S. Department of Labor, based on standards of the Occupational Safety and Health Act. Many of the courses are conducted at various corporate and government training facilities around the U.S.

The center also provides Title 8-based safety and health courses throughout California to assist companies, utilities, and others to comply with Cal/OSHA standards.

For information, call (800) 358-9206.

LIFELONG LEARNING OPPORTUNITIES

People who enjoy reading, thinking and talking about ideas, exploring the philosophies of other cultures and other times, or exercising their creative talents have a special resource in UCSD Extension. People interested in keeping current on changing trends and public issues can also turn to UCSD Extension for in-depth analyses and discourse. Courses and workshops are offered in painting, music, acting, literature, history, oceanography, political science, health, and foreign languages, to name just a few. A variety of free public lectures, community forums, and public policy seminars are also available from the campus under the auspices of Extended Studies and Public Service. For more information, call (619) 534-3400.

LIBERAL ARTS AND INTERNATIONAL PROGRAMS

Courses in English as a Second Language, foreign languages, arts, humanities, writing, and general interest are all offered through the Department of Liberal Arts and International Programs. The English Language Programs include year-round, ten-week intensive programs for international students as well as short courses in conversation and in specialized areas such as business English and medical English. Evening courses for foreign professionals are also available in accent reduction, technical writing, and oral presentation. A large number of foreign languages are also offered as well as liberal arts programs addressing topics of broad interest to the community.

HEALTHCARE MANAGEMENT AND DELIVERY

The delivery of healthcare is no longer just a professional practice, it is big business with complex financing structures, and integrated networks comprised of hospital systems, physician groups, and insurance companies. The business and provision of healthcare is a critical issue from an economic, sociological, and clinical perspective. UCSD Extension, through EdVantage: San Diego's Parnership for Professional Healthcare Education, offers continuing education in healthcare management and healthcare delivery. Certificate programs and an advanced executive leadership program for healthcare providers are available, as is a beginning and advanced certificate program in fitness instruction and exercise science.

LEGAL ASSISTANT TRAINING PROGRAM

Both daytime and evening programs are offered through UCSD Extension to provide the education and skills needed to perform the tasks of the legal assistant who works as a member of the legal team in law firms, corporations, governmental agencies, and other organizations. Both programs have been approved by the American Bar Association.

CONCURRENT REGISTRATION

Concurrent Registration is a procedure that allows individuals who are not officially matriculated UCSD students to participate for credit in regular UCSD courses. Enrollment is on a space-available basis with the approval of the course instructors. Individuals must register through UCSD Extension. Information on this program can be obtained through the UCSD Extension Registration Office, (619) 534-3400.

Through a reciprocal arrangement with the university, UCSD Extension offers a limited number of complimentary enrollment to full-time UCSD seniors, juniors, and sophomores, who may enroll in one free course of up to $270 (students must pay anything over the amount) on a first-come, first-served basis. Graduate students please contact OGSR. Medical students contact your department.

PROGRAMS FOR RETIRED PERSONS

The Institute for Continued Learning (ICL) is an organization for retired persons conceived, developed, and directed by retirees themselves. ICL has an active learning and social program created by members, including seminars, study groups, classes, forums, trips, and luncheons. Approximately 350 members participate in ICL activities. Information is available by calling (619) 534-3409.

The UCSD Libraries

The UCSD Libraries consist of the Social Sciences and Humanities Library, the Science and Engineering Library, the Biomedical Library and Medical Center Library, the Scripps Institution of Oceanography Library, the International Relations and Pacific Studies Library, the Undergraduate Library, the Art and Architecture Library, the Music Library, and The Mandeville Library of Special Collections.

COMBINED UCSD LIBRARIES STATISTICS, 1995

Volumes	2,366,019
Periodical and other serial publications received	23,906
Government documents	116,537
Maps	211,338
Microforms	2,465,877
Audio and video materials	74,330
Slides and other pictorial items	275,246
Computer files	7,426

The library is a center for study, reading, and scholarship at UCSD. Its 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 its Instructional Services Program, the library offers 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 campuswide 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® (the University of California systemside 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 534-3336 for an up-to-date schedule of open hours for all libraries (recorded message).

SOCIAL SCIENCES AND HUMANITIES LIBRARY

(located north of the Price Center in Geisel Library)
Mail code 0175R
(619) 534-3336

The SS&H Library houses the research collections in the social sciences and humanities (1,294,120 vols.). Its reference collection contains an outstanding collection of bibliographies, indexes, encyclopedias, biographical directories, and other information resources in print and electronic form. The Documents Collection is a depository for the official publications of California, the United States, the United Kingdom and the United Nations, and also contains a major topographical and political map collection.

SCIENCE AND ENGINEERING LIBRARY

East Wing, Geisel Library
Mail code 0175E
(619) 534-3258

The Science and Engineering Library contains strong collections in the physical sciences and

technology (210,990 vols.). Of particular importance are its research materials in chemistry, computer science, electronics, engineering, mathematics, physics, space sciences, nuclear energy, and materials science.

BIOMEDICAL LIBRARY AND MEDICAL CENTER LIBRARY

Basic Science Building, School of Medicine
Mail code 0175B
(619) 534-3255

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 (201,373 vols.). A branch library, the Medical Center Library (25,496 vols.), supports the activities of health care providers at the UCSD Medical Center in the Hillcrest area of San Diego. Mail code 8828, 543-6520.

INTERNATIONAL RELATIONS AND PACIFIC STUDIES LIBRARY

Mail code 0175W
(619) 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 (62,413 vols.).

SCRIPPS INSTITUTION OF OCEANOGRAPHY LIBRARY

Mail code 0175C
(619) 534-3274

Scripps Institution of Oceanography Library is one of the largest marine science libraries in the world (230,874 vols.). It has outstanding collections in marine biology, oceanography, and marine technology, and also specializes in geology, geophysics, and zoology.

UNDERGRADUATE LIBRARY

Galbraith Hall
Revelle College
Mail code 0175D
(619) 534-3065

Undergraduate Library has a general collection (78,990 vols.) and provides reference and instruction services especially designed to meet the needs of lower-division undergraduates. UGL's Playback Center houses a permanent audiovisual collection (2,367 audio; 1,546 video) and reserve materials used by faculty in their classes.

ART AND ARCHITECTURE LIBRARY

West Wing, Geisel Library
Mail code 0175F
(619) 534-4811

The Art and Architecture Library's collections support the study of the visual arts and architecture (46,591 vols.; 239,984 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.

MUSIC LIBRARY

West Wing, Geisel Library
Mail code 0175Q
(619) 534-2759

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 centered around twentieth century and chamber music performance materials. 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 and video tapes, laser discs, and CD-ROMs.

THE MANDEVILLE LIBRARY OF SPECIAL COLLECTIONS

West Wing, Geisel Library
Mail code 0175S
(619) 534-2533

The Special Collections (154,000 vols.) include rare books, manuscripts, and other research materials. Other resources include materials about Baja California, Pacific Voyages, the Spanish Civil War, science and public policy, and modern poetry.

Student Services

Vice Chancellor, Student Affairs

Building 112 University Center
Mail code 0015
(619) 534-4370

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

Mail code 0330
(619) 534-3750

The Career Services Center exists to help UCSD students and alumni determine and fulfill their employment and career goals. To that end, we offer the following services:

Career Development: Resources are available through individual advising, computerized testing programs, workshops, a career information fair, practical experience, and reference materials to provide occupational information.

Tools, Techniques, and Tactics: Resume, interviewing and job search workshops, information sessions regarding graduate school admissions, critiques for resumes and personal statements, individual advising and reference materials.

Job Opportunities: Job listings (updated daily), on -campus interviews with employers in various fields, networking programs, job fairs and reference materials to identify potential employers.

Graduate School Opportunities: Annual fairs with recruiters from professional and graduate schools, individual advising, reference letter file service, reference materials regarding individual schools, program information, fellowship opportunities, and graduate school admission testing brochures.

College Deans' Offices

Revelle, Mail code 0321, (619) 534-3492
Muir, Mail code 0106, (619) 534-3587
Marshall, Mail code 0509, (619) 534-4390
Warren, Mail code 0022, (619) 534-4731
Roosevelt, Mail code 0069, (619) 534-2237

The staffs of the college deans' offices perform many different functions. They provide help, advice, counseling, and referral in many areas including commuter and residential matters. The deans' offices regularly develop and coordinate activities such as orientation, Welcome Week, commencement, leadership opportunities, decisions about remaining in or withdrawing from school, college disciplinary matters, involvement in student governments, planning social and educational activities, handling housing concerns, assisting with specialized concerns for physically limited students, and assisting in hearing procedures regarding grievances.

Contact your college dean's 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.

Commuter Student Services Office

Student Center, Building B
Mail code 0309
(619) 534-3670

A major function of this office is to assist commuter students in their search for non-university housing. This office maintains an up-to-date listing service for a variety of rentals in various areas near the campus. These listings, advertised on bulletin boards within the office, include individual houses, condos, and apartments, as well as roommate, room in a private home, and work-exchange situations. Listings are not mailed, as availability changes daily.

UCSD is located in the midst of a resort area, commanding higher rents than most other areas in San Diego County. Lower rentals may be found as you travel south and inland of the campus. A general rule is, the closer to the beach the higher the rent.

Approximate monthly costs for unfurnished rentals, excluding utilities, are:

$300–$450–for furnished room with kitchen privileges
$250–$500–for own room in a home with other students (roommate)
$425–$625–for studio or bachelor apartment
$500–$800–for one-bedroom apartment or house
$675–$1,100–for two-bedroom apartment, condo, or house
$1,000–up–for three-bedroom apartment, condo, or house
$1,500–Up–for four-and five-bedroom house

Furnished rentals will generally cost an additional $50 to $100 per month.

It is suggested that students who wish to find off-campus housing plan to make arrangements early by consulting the available rentals posted in the office. The best time to begin looking for housing is from two to three weeks before the start of the fall quarter, and one to two weeks before the spring and winter quarter.

During September, the office operates a Temporary Emergency Housing Program. The program provides dorm-style lodging for students while they locate permanent housing. Space is limited, and reservations are recommended.

A variety of house-hunting aids are available: current classifieds from all local newspapers, rental publications, landlord/tenant information, maps, bus schedules, and courtesy telephones are available for your use.

The Commuter Student Services Office is supported by student fees and its services are available to registered students only. Students are required to bring a registration ID card or a letter of acceptance when using the office services.

Student-Staff Connection Mentor Program

Student Center Building B
Mail Code 0309
(619) 534-3670

The Student-Staff Connection Mentor Program is an all-campus mentor program for all freshman and transfer students at UCSD. By participating in the Student-Staff Connection, a student will be connected with a staff person who wants to share his or her knowledge and experience and is willing to give that extra caring outside of the classroom. The Student-Staff Connection is a vehicle by which a special need or concern a student might have can be addressed to enhance his or her college experience.

Mentors are UCSD staff who care especially about students. They are willing to give their extra time to being a friend, answering questions, and providing guidance. Mentors are trained professionals who serve without pay and volunteer their personal time to care for a student. They serve as role models and a resource.

The four purposes of the Student-Staff Connection Mentor Program are:

1. To help facilitate a positive personal relationship between a student and a UCSD staff member.
2. To help a student develop his or her full potential, both in and outside the classroom.
3. To enhance a student's relationship with the UCSD campus and reinforce his or her commitment to a university degree.

4. This program is an enhancement to other UCSD Academic Mentor Programs within the colleges.

To sign up for the program, contact your college dean's office or call the Student-Staff Connection Office at (619) 534-3670.

Dining Services

Administration: Muir Commons Annex
Mail code 0122
(619) 534-4013

A variety of high quality food appealing to all types of diners is served in distinctive settings at UCSD Dining Services facilities. Dining commons and restaurants are located at Revelle, Muir, Warren, and Thurgood Marshall Colleges, as well as the School of Medicine, and Scripps Institution of Oceanography. Many are located near residence halls.

Each restaurant has its own unique atmosphere and menu with hours depending on location and time of year. Students and members of the community are welcome to dine at any facility.

A meal plan is mandatory for residence hall students and optional for apartment residents. Please refer to the "Housing" section for meal plan options and prices.

UCSD Plus, the campus declining balance program, is also available from Dining Services. Accepted at over forty locations, UCSD Plus offers an easy, convenient, and secure way to shop and dine on campus. For information, call (619) 534-7587.

Students use their official UCSD photo ID card to access meal plan and UCSD Plus accounts.

Other food service facilities 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. Dining Express, the mobile dining unit, stops at many locations around campus.

Disabilities, Office for Students with (OSD)

202 University Center
(619) 534-4382 (Voice/TDD)
(619) 534-4650 (Fax)

OSD facilitates student development and independence through the coordination of campus programs, services, and facility access. Coordination may include disability management counseling, note takers, sign language interpreters, readers, typists, library/laboratory assistants, special equipment loans/minor repair, priority registration/enrollment assistance, on-campus housing coordination, exam arrangements, and on-campus transportation/parking coordination referrals. OSD also serves as a liaison with academic departments and campus community, as well as off-campus disability-related agencies. In addition, OSD provides disability awareness through maintenance of a resource library of books, periodicals, articles, films, and video formats about disability issues, and as requested, provides on-campus disability awareness workshops.

Financial Aid

Student Financial Services

All financial assistance for undergraduate and medical students and need-based aid for graduate students is administered by Student Financial Services. Information relating to graduate student support in the form of fellowships and assistantships is presented in the catalog section entitled "Graduate Studies."

Student Financial Services is located in University Center 201 and can be contacted at the phone numbers below. Student Financial Services also includes the Scholarship Office and the Office of Veterans' Affairs.

Thurgood Marshall College	(619) 534-3805
John Muir College	(619) 534-3808
Revelle College	(619) 534-3806
Eleanor Roosevelt College	(619) 534-2550
Earl Warren College	(619) 534-4686
Graduate Division	(619) 534-3807
Scholarship Office	(619) 534-3263
Veterans Affairs	(619) 534-3971

Applications and requests for information should be addressed to the appropriate area of Student Financial Services as follows: Attn: (your undergraduate college name or graduate division), Student Financial Services, 0013, La Jolla, California 92093-0013.

No student should leave the university for financial reasons before exploring all possible avenues of assistance with a Student Financial Services 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.*

Applying for Student Financial Assistance

UCSD students must meet the following criteria to be eligible for financial assistance:

1. Be a United States citizen or eligible noncitizen.
2. Be accepted to or enrolled at least half-time in a program leading to a degree or certificate and maintain satisfactory academic progress as defined for UCSD financial aid recipients.
3. Not owe an overpayment on any Title IV educational grant or be in default on any Title IV educational loan unless satisfactory arrangements to repay or otherwise resolve the overpayment or default have been made.
4. Be registered with Selective Service if you are a male who is at least eighteen years old and born after December 31, 1959, unless you are not required to be registered.

For evaluation of financial need, all applicants must submit a *Free Application for Federal Student Aid (FAFSA)* and, if required, copies of the 1995 federal income tax returns, and any other required documents. The *FAFSA* form should be filed by March 2, 1996, the UCSD priority filing date, with the appropriate processing agency and must indicate the University of California, San Diego (list Title IV School Code 001317 in item 92) to receive a processed copy of the *FAFSA*.

Receiving Financial Assistance

UC financial assistance for students with demonstrated financial need is funded by a combination, or "package", of grant 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 nonresi-

dent tuition ($7,699 during 1995–96). The family should be prepared to provide this amount from its 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 ranged from $400–$2340 for 1995–96.

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 applicants for UCSD aid are required to apply for a Cal Grant. To be considered as a new winner, the *FAFSA* and GPA Verification Form must be submitted by March 2, Current recipients must file a *FAFSA* or a *Renewal FAFSA* each year to have their award renewed.

California State Graduate Fellowship

California State Graduate Fellowships are awarded by the California Student Aid Commission to California residents who are admitted to or continuing in a graduate degree program. This fellowship assists eligible students with registration fees and is awarded to disadvantaged, academically proficient students who can demonstrate financial need and intend to pursue an academic career at the collegiate or university level. Current recipients must file a *FAFSA* or *Renewal FAFSA* each year to have the award renewed. The *FAFSA* must be filed by the preceding March 2.

Work-Study

Federal and state work-study programs 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 repayable loan carries a 5 percent interest rate. Students begin paying both the principal and the interest 6 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. The 1995–96 rate was 8.25 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. Independent undergraduates may borrow an additional $4-5,000 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 may be deferred until the student enters repayment. Repayment begins after the final disbursement but may be deferred until the borrower ceases 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 1995–96, the interest rate was 8.98 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.

Deferred Payment Plan (DPP)

The UCSD Deferred Payment Plan (DPP) 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 DPP 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 fee that must be submitted with the application to the Bursar's Office. This fee is strictly used to offset the costs of the program. Applications may be obtained and submitted at the Bursar's Office.

Emergency Short-Term Loans

These limited student emergency loan funds, made possible by gifts to the university, are granted in small amounts to help nonfinancial aid 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. Applications and further information are available from Student Financial Services.

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 encourage academic excellence and to recognize outstanding achievement. Scholarships are awarded to students on a competitive basis. Honorary scholarships are awarded solely on the basis of academic excellence. Several restricted scholarships may also be awarded as honorary. Students must reapply for undergraduate scholarships each academic year, with the exception of the Regents Scholarships, which are awarded for a two- or four-year term. The Committee on Undergraduate Scholarships and Honors (CUSH), composed of UCSD faculty members, selects the recipients.

Notification of scholarship awards starts in May. Notification of need-based awards is made in the Financial Aid Award Letter, which will be mailed beginning in June 1996. For all scholarships, letters are mailed only to those students selected. We regret we are unable to mail denial notification to other applicants.

How to Apply for Scholarships

Students entering UCSD from high school or another postsecondary institution must complete Section X on the *University of California 1996–97 Undergraduate Application for Admission and Scholarships.* The deadline for submission of the application is November 30, 1995. No supporting documents are required.

1996–97 scholarship applications will be available in January 1996 to all highly-qualified continuing UCSD students. Those who wish to apply for scholarships should obtain an application from Student Financial Services (SFS). Prior students planning to be readmitted to UCSD during 1996–97 should request an application from SFS. The deadline for submission of the scholarship application is February 16, 1996.

Regents Scholarships

The Regents of the University of California annually provide each campus with Regents Scholarships, which are considered to be the most prestigious of university awards. Recipients are selected on the basis of academic excellence and exceptional promise. The Committee on Undergraduate Scholarships and Honors, composed of UCSD faculty members, selects the entering recipients with emphasis on the following criteria: GPA (capped at 4.00), math and verbal SAT I scores, SAT II scores, honors courses, and additional a-f courses taken beyond the requirement. The actual GPAs of entering students selected as Regents Scholars in 1995–96 ranged from 3.83 to 4.80 with a mean of 4.13, while the median of the combined SAT I scores totaled 1390. Continuing UCSD students who were offered the Regents Scholarship averaged a 3.89 UC GPA in 1995–96. This scholarship is awarded to students beginning their freshman or junior years, for a term of four or two years, respectively. Renewal of the scholarship is automatic, provided the student maintains at least a 3.0 cumulative UC GPA and completes thirty-six units annually at UCSD.

The dollar amount of each Regents Scholarship is based on the student's financial need, which is reassessed each year. Entering 1996–97 Regents Scholars who do not submit a financial aid application *(FAFSA)* or are determined not to have financial need will receive a $1,000 annual honorarium scholarship for four years. Continuing Regents Scholars who do not submit financial data or who are determined not to have financial need receive a $1,000 honorarium during each year of appointment. International students, as sophomores, are eligible to apply for the Regents Honorarium Scholarship for appointments beginning in the junior year. Regents Scholars who demonstrate financial need receive a stipend to cover the difference between their family and outside resources, and the yearly cost of attending UCSD, excluding nonresident tuition. This basic cost is established each year by Student Financial Services and includes required fees, books and supplies, room and board, personal and transportation expenses.

Regents and National Merit Scholars are also eligible for certain privileges and recognitions such as: preferred class enrollment, guaranteed on-campus housing for four years (provided housing deadlines are met), UCSD college of choice at time of admission (Regents only), graduate student library privileges, honors seminars, and expanded computer accounts.

The Ellen and Roger Revelle Scholarship

This prestigious scholarship recognizes two outstanding undergraduate students entering UCSD each fall. The scholars are chosen on the basis of academic excellence and exceptional promise. Each award grants a $1,500 annual honorarium for four years.

Scholarships for National Merit Finalists

Funded by the Alumni Association, the Council of Provosts, and Student Financial Services, National Merit Scholarships are offered to finalists who attend UCSD and whose National Merit awards are not funded by corporate sponsors. Annual stipends range from a $500 honorarium to a $2,000 need-based stipend. Refer to the "Regents Scholarships" section for a listing of the UCSD privileges accorded National Merit winners.

Shimotori Memorial Scholarship: This fund provides support to an outstanding scholar who is a California resident exhibiting academic excellence and financial need. It pays the full cost of California resident fees.

Ed and Mary Fletcher Foundation Scholarship: Awarded with preference to needy U.S. citizens who have graduated from a San Diego County high school with demonstrated academic excellence.

Restricted Scholarships

Some of the scholarships at UCSD have special eligibility requirements. If selected, you may be required to provide written verification of how you meet the restricted criteria.

Scholarship Restricted by Geographic Area

Mabel Wilson Richards Scholarship: Restricted to women residents of the Los Angeles area for the past two years. Based on scholastic achievement (at least a B average), financial need, and promise. Must apply and be eligible for financial aid. Must be a U.S. citizen or, if under twenty-one, at least one parent should possess a permanent resident visa.

Scholarships Restricted According to Parentage

CAL-DIEGO Paralyzed Veterans Association Scholarship: Awarded to California residents who are dependents of Vietnam era or post-Vietnam era veterans or who are disabled students. Based on scholastic excellence and leadership qualities, regardless of financial need.

Brython P. Davis Scholarship: Awarded to students whose parent is or was a regular member of the U.S. Navy or Marine Corps.

LaVerne Noyes Foundation Scholarship: Awarded for payment of fees to descendants of World War I veterans (defined as four months of service prior to November 11, 1918).

Malcolm R. Stacey Memorial Scholarship: Awarded to students in the following priority: (1) undergraduate Jewish students who are orphans and preparing for graduate study in aeronautical engineering; (2) undergraduate or graduate Jewish students in the field of aeronautical engineering; (3) Jewish students in the Division of Engineering; (4) Jewish students in any field of study.

Scholarships Restricted to Certain Fields of Study

Klara D. Eckart Scholarship: Awarded to promising students in the fields of computation, mathematics, and physics.

Thomas E. Curtis Scholarship: Recognition of outstanding juniors or seniors 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.

KFMB Scholarship: Awarded to upper-division students who are permanent residents of San Diego or Imperial Counties and are studying communications with a media emphasis.

Laura E. Settle (California Retired Teachers Association) Scholarship: Awarded to an upper-division student who is planning a career in teaching. Candidates must be declared majors in TEP (Teacher Education Program).

Scholarships for Disabled Students

ALL PERSONAL OR MEDICAL INFORMATION REMAINS CONFIDENTIAL.

CAL-DIEGO Paralyzed Veterans Association Scholarship: Awarded to California residents who are disabled students or who are dependents of Vietnam era or post-Vietnam era veterans. Based on scholastic excellence and leadership qualities, regardless of financial need.

Jaye Haddad Memorial Fund: Established to assist students who have been diagnosed with cancer and is also available to students with Acquired Immune Deficiency Syndrome (AIDS), AIDS-Related Conditions (ARC), or students with physical disabilities.

THE UNDERGRADUATE RESEARCH SCHOLARSHIP PROGRAM

Three undergraduate research scholarship programs are available to assist students in pursuing special studies and projects under faculty supervision. Detailed information and applications are available in Student Financial Services each year during the month of April. The deadline to apply for these awards is May 17, 1996. The Committee on Undergraduate Scholarships and Honors reviews project proposals and selects winners. A faculty member may supervise only two research scholarship students per academic year. Winners, who must be enrolled throughout 1996–97, are awarded a need-based stipend, determined by the cost of the project.

UCSD Undergraduate Research Scholarship: This program helps unusually talented undergraduate students pursue special studies and projects, under faculty supervision, during term time and/or vacations. Projects may include research and/or other creative activities.

David Jay Gambee Memorial Research Scholarship: This memorial research scholarship has been established from funds donated in memory of David Jay Gambee, a former UCSD Revelle College student. Proposals which involve the student as an active citizen in university governance, the local community, or national and international affairs are given preference. Also receiving preference are projects which lead to a heightened awareness of the relationship between the environment and society. Service in the community through volunteer activities or assisting students to participate in programs related to the Institute on Global Conflict and Cooperation are encouraged.

David Marc Belkin Research Scholarship: This memorial has been established from funds donated in memory of David Marc Belkin, a former Muir College student. This research scholarship is designed to pursue special studies and projects in the general areas of environmental and ecological issues. This includes, but is not limited to, pollution, preservation of natural resources, population management issues, etc.

Housing

ON-CAMPUS HOUSING

Administration:
Building 310 University Center
Mail code 0041
(619) 534-4010

SINGLE UNDERGRADUATE HOUSING

Revelle, John Muir, Thurgood Marshall, Earl Warren, and Eleanor Roosevelt Colleges have residence hall accommodations. Residence halls are arranged around a suite plan with students sharing a common living-study area. Most of the rooms are designed for double occupancy. Most of the single rooms are usually reserved by returning students. The residence hall contract provides for a mandatory board plan. The estimated cost for room and board is approximately $6,700 plus a $75 deposit for the 1996–97 school year (fall-winter-spring quarters) and will vary depending upon payment and meal plans chosen and type of room accommodation.

Single and double rooms in apartments at Muir, Marshall, and Roosevelt Colleges are available. UCSD also offers two-bedroom apartments for four single undergraduate students of Marshall College, Warren College, and Revelle College. The estimated cost for room only is $3,800 plus $75 deposit for 1996–97. A board plan is available for all apartment dwellers on an optional basis.

A housing brochure with an application for on-campus housing is sent, in mid-February, to all who have applied for admission to UCSD. Students must return the housing application with a $20 nonrefundable application fee to the Housing Administration office and file a Statement of Intent to Register form with the Admissions Office to be eligible for housing. Contracts are issued in batches based on a priority system and as space permits beginning in late May and about every four weeks thereafter throughout the summer. The priority system is explained in detail in the housing brochure.

The housing application deadline for guaranteed housing for fall 1996–97 was May 6, 1996, for new freshmen and transfers. However, applications are still being accepted. Students guaranteed housing are accommodated first. First-time freshmen living more than a fifteen-mile radius from campus (determined by zip code) have priority for new student space in the residence halls and some single undergraduate apartments on a space available basis.

The Housing Administration Office recommends that students who are still on the waiting list telephone the office in early August for further information.

The resident dean of the applicable college assigns rooms in the residence halls or spaces in the apartments. The Housing and Dining Services Administration Office, located in Building 310 University Center, administers housing contracts and handles other details related to housing contracts.

Housing for married students and single graduate students is available in studio, one-bedroom, two-bedroom, three-bedroom, and four-bedroom apartments in the Residential Apartments, Single Graduate Apartments, and La Jolla Del Sol complexes.

MARRIED AND SINGLE GRADUATE HOUSING—OFF-CAMPUS

Located approximately two miles from campus, the Residential Apartments and La Jolla Del Sol Apartments are the primary university housing facilities available to married students and single graduate or medical students.

The Residential Apartments (Coast Apartments and Mesa Apartments) are older-style studio, one-, two-, and three-bedroom units. All are unfurnished except for stoves, refrigerators, and drapes/blinds. Most units are carpeted and some have sheet-vinyl flooring.

La Jolla Del Sol offers one- and two-bedroom luxury condo-type units with a full array of amenities. This facility also includes two pools, jacuzzis, two tennis courts, weight room, and assigned parking.

Married students without children may reside in a one- or two-bedroom unit. Married students with children may reside in a two- or three-bedroom unit. Single graduate students may choose a studio, one- or two-bedroom unit. If a two-bedroom unit is selected by a single student, at least one other roommate is required, who must meet all eligibility requirements.

Current rental rates range from $381 to $957 per month unfurnished and are subject to change with 30 days' prior notice.

The Residential Apartments currently have extensive waiting lists.

SINGLE GRADUATE HOUSING—ON-CAMPUS

Opened in fall 1993 and located on the main campus are apartments for single graduate and medical students. These units on the Warren College campus are four-person apartments, each having private bedrooms and a shared kitchen, bath, and living/dining space. All units have cable TV included at no extra cost and optional connections to the campus comptuer system for a fee. All spaces are available on a 12-month lease and the 1995–96 rental rate is $303 per month per person.

NOTE: All policies and procedures concerning the operation of married and graduate student housing, the eligibility for housing, and the application process are subject to change without notice.

For more detailed information on any of the above graduate or married housing facilities and/or an application, you may write, apply in person, or telephone the Customer Service Center at the following:
Affiliated Housing Information
Customer Service Center
UCSD
9500 Gilman Drive, Dept. 0904
San Diego, CA 92093-0904
(619) 534-4723

International Center

(Located at the corner of Gilman Drive and Library Walk)
Mail code 0018
(619) 534-3730
Facility reservation: (619) 534-6442

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 systemwide 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 women's volunteer support organization for the university.

Psychological and Counseling Services

Central Location:
1003 Galbraith Hall
Revelle College
Mail code 0304
(619) 534-3755

Psychological and Counseling Services provides professional assistance to students having difficulty in coping with any of a wide array of problems. In addition, members of the staff offer professional consultation to the university regarding matters of student behavior to prevent problems and enhance the student experience.

Specific problems for which students may seek help include loneliness and isolation, personal problems, homesickness, parent/family problems, difficulties with studying, concentrating and test taking, relationship/marital problems, sexual difficulties, educational/career questions, depression, and anxiety.

Individual and group counseling, psychotherapy, marriage or relationship counseling, sex therapy, family therapy, behavioral and hypnotic techniques, and many issue-related groups are provided for dealing with these problems.

During any year support groups, such as ones for ethnic minorities, reentry students, women in medicine, men in medicine, women in science and engineering, and gay and lesbian students are offered. Time-limited focus groups include social skills, coping skills, assertion training, stress management, test anxiety reduction, decision making, coping with alcohol and drug abuse, eating disorders, enhancing creativity, weight management, and life-style workshops.

Members of Psychological and Counseling Services are clinical and counseling psychologists and social workers. The service has offices at all colleges in addition to the central location.

Services are available to any regularly enrolled undergraduate, graduate or medical school student, by contacting the central office. The counseling relationship is private and confidential.

Recreation

RIMAC
Mail code 0529
(619) 534-4037

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, weightroom, racquetball and squash courts, and equipment room.
- Main and Recreation Gymnasia
- Indoor 25-Yard Natatorium Pool and Spa
- Outdoor 50-Meter Canyonview Pool and Spa
- Canyonview Racquetball Center
- Canyonview Climbing Wall
- 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, badminton, and over-the-line.

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. RecClubs include interests from aerobics to wrestling.

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 cycling, lacrosse, sailing, surfing, rugby, snow ski racing, ice hockey, and ultimate disc.

RECREATION CLASSES

Recreation classes provide students and the university community an opportunity for noncredit, nongraded instruction in a range of physical and leisure activities. The program includes professional instruction in everything from aerobics, 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, mountain bikes, camping equipment, and game equipment.

AQUATICS

UCSD Campus Recreation Aquatics encompasses a wide range of aquatic activities. Student users can participate in competitive and training programs in diving, swimming, and water polo. 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.

OPEN (INFORMAL) RECREATION

Open 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)

INTERCOLLEGIATE ATHLETICS AT UCSD

With twenty-two teams to choose from, the Intercollegiate Athletics Program provides students with varying interests the opportunity to participate in a highly competitive program. As a nonscholarship institution, UCSD's Tritons compete in the NCAA Division III, achieving national prominence in several sports. The women's volleyball team is the only collegiate team at any level to have captured five national women's volleyball championships, winning the NCAA title in 1981, 1984, 1986, 1987, and 1988. Women's tennis has also brought back championship trophies, winning national titles in 1985, 1987, and 1989. The men's soccer team won its first national championship in 1988, while the women's soccer team was the best in the nation in 1989. In addition, the women's water polo team won the USA Collegiate National Championship in 1985.

Over the past decade, UCSD has produced national runners-up in men's golf (1985, 1986, 1987), women's swimming (1986, 1988, 1989), men's soccer (1986), women's volleyball (1982, 1983), women's soccer (1988), men's swimming (1989), women's water polo (1989), and women's tennis (1982, 1984); and national third place teams in men's swimming (1984, 1985, 1986, 1987, 1988), women's swimming (1985, 1987), women's soccer (1986), women's tennis (1988), women's water polo (1988), and men's soccer (1989). The Tritons have also reached the national top ten in men's baseball, men's tennis, women's softball, and women's track and field. Individually, 37 Tritons have captured national championships, while 300 have been named All-Americans during the 1980s. Twenty were named Academic All-Americans and three were given the prestigious NCAA Postgraduate Scholarship.

Sports offered for men and women include volleyball, basketball, soccer, tennis, swimming and diving, water polo, cross country, crew, fencing, track and field, and golf. Men's baseball and women's softball are also offered. In addition, the intercollegiate athletic department sponsors club sports including surfing, badminton, cycling, sailing, rugby, snow skiing, and lacrosse. Opportunities to be a part of the athletic atmosphere are also available in the UCSD Pep Band, Cheerleaders, and Triton Athletic Associates. In each of the intercollegiate programs, student/athletes enjoy healthy physical activity, the struggle for excellence, travel with teammates to other universities, a sense of belonging, and a feeling of pride in their team and university.

Religious Affairs

Building 502 University Center
Mail code 0081
(619) 534-2521

The Office of Religious Affairs is a privately-funded cooperative venture of representatives from various religious denominations for the purpose of serving as a campus resource on a non-sectarian basis, sponsoring lectures and facilitating discussion of theological, ethical, and moral issues faced by students, faculty, and staff at UCSD.

Student Affirmative Action and Human Relations Programs

Student Center B
Mail code 0362
SAA & HR Programs Office: (619) 534-6708
Program Interns Office: (619) 534-2573

Student Affirmative Action Committee (SAAC): (619) 822-0608

This unit serves as a campus resource on issues of cross-culturalism and provides ongoing workshops, discussions, and presentations on topics such as: cross-cultural communication, racism, sexism, and homophobia. The office provides programming and maintains a small lending library of video and written resources which may be used to further discussion on these important topics. SAA & HR Programs serves as a support mechanism and a vehicle through which SAA concerns are articulated, addressed, and, where appropriate, resolved. In addition to educational programming, the major program components include:

The Student Affirmative Action Committee (SAAC) serves as an advisory body to the vice chancellor of Student Affairs on issues which affect the quality of campus life and the educational experience of underrepresented students at UCSD. It also serves in an advisory capacity to the office of SAA & HRP in the implementation of its annual goals and objectives, including the allocation of funds for activities that promote positive race relations and cross-cultural/multiethnic understanding. SAAC membership is composed of representatives from the African American Student Union (AASU), Asian/Pacific Islander Student Alliance (APSA), Disabled Students Union (DSU), Kaibigang Pilipino (KP), Movimiento Estudiantil Chicano de Aztlán (MEChA), Native American Student Association (NASA), and the Women's Resource Center (WRC).

The SAA & HR Resource Intern Program has been in existence since 1976. Interns assist the SAA & HR Programs in its programming and research efforts. As time permits, the interns may be utilized to provide information, guidance, and general assistance to the SAAC.

Complaint Report/Resolution: Students may report incidents and situations of racial insensitivity and/or discriminatory practices. Where undergraduate students are directly involved—and when knowledge of such practices is gained—staff and faculty are encouraged to contact the office as well. SAA & HR Programs staff will provide educational programming, advocacy, or referral as appropriate.

Student Health Service

Mail code 0039
(619) 534-3300

Comprehensive primary health care, urgent care, laboratory, x-ray, as well as health education programs are provided *free of charge* to all registration paying students during the academic quarters. A one-time health fee is charged during the summer quarter to continuing students.

Specialized care is provided through the Women's Clinic, Sports Medicine Clinic, Dermatology Clinic, Nurses' Clinic, and Travel Clinic, most at no additional fee.

Reduced fees are charged for pharmaceuticals, contraceptives, travel immunizations, PAP smears, and some laboratory tests. A Dental Clinic and Visual Care Clinic are available at modest fees.

Although undergraduate, graduate, medical, and international students may have unlimited visits with Student Health Service, students requiring medical or surgical care from outside practitioners, hospitals, or clinics should be prepared to assume the cost of such care. All students are *strongly urged* to have and maintain adequate health insurance.

A *Voluntary Insurance Plan (VIP)* is available for purchase by undergraduate students each quarter. This adds benefits for hospitalization, surgery, and major medical expenses. The premium for this insurance plan may be paid along with student fees.

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 referral. 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. A representative of the insurance company has an office at Student Health Service and is available to assist students.

Student Policies and Judicial Affairs

Building B, Student Center
Mail code 0329
(619) 534-6225

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, 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 provides legal advice and consultation to faculty and administrators on student-related matters. Other programs encompassed by SP&JA include the Student Legal Services Office and the Office of Religious Affairs.

Student Legal Services

Building B, Student Center
Mail code 0329
(619) 534-4374

Student Legal Services (SLS) provides advice, counsel, and assistance 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, Adoption, and Answers to Complaints for Unlawful Detainer. Student Legal Services also counsels and prepares students for 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.

Student Safety Awareness Program

Building B, Student Center
Mail code 0309
(619) 534-5793

The Student Safety Awareness Program (SSAP) is the primary source of information, crisis intervention, and follow-up support regarding sexual assault 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 rape and other sex offenses, 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. SSAP outlines procedures to follow if a sex offense occurs, if a victim reports to law enforcement and/or uses the on-campus disciplinary process.

SSAP provides information and education about sexual harassment. Students who have questions and/or concerns may seek confidential assistance by calling the above number.

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: (619) 534-4022

Located in the center of campus just south of Geisel Library, the Price Center offers a variety of services as well as several meeting and study places geared to the needs of students. The Price Center includes the university bookstore, a movie theater, copy and technology center, travel store, post office, video and billiard gameroom, and a photo lab for students' use. Located in the food court at the Price Center are eight fast-service restaurants: Chung King Loh, Desserts Limited, Wendy's, Tia Molly, Subway, Espresso Roma, Round Table Pizza, and On the Juice. The Price Center has three comfortable lounges and fifteen meeting rooms including a large ballroom which hosts concerts and dances throughout the year. Many student organizations call the Price Center their home. Also located in the Price Center are the administrative offices of the Associated Students, University Events, and the office of Student Organizations and Leadership Opportunities.

THE STUDENT CENTER

Mail code 0323
Administration office: (619) 534-8929

The Student Center, located east of the Main Gym, offers a variety of services geared to the needs of students and the campus community and includes the Crafts Center and Grove Gallery. The Women's Resource Center is also housed in the Student Center. Many student-centered services are located here, including the Bike Shop, General Store, Groundwork Bookstore, Food Co-op, Soft Reserves and Lecture Notes, and KSDT Radio. The Grove Caffe serves specialty coffees and pastries as well as other food and drink. An ATM and fast copy center are additional services available to the campus community. The Pub, a unique event/meeting facility, is located here along with Porter's at the Pub, which serves light faire and where those over the age of 21 can purchase a beer. The campus media, including *The UCSD Guardian* have their offices here. Just south of the Student Center on the Revelle campus is the Ché Cafe, which serves a vegetarian menu at affordable prices.

STUDENT INFORMATION CENTER (EDNA)

Mail code 0076
Administration Office: (619) 534-3362

Located in the Price Center Plaza next to the theater lobby, the information desk serves the campus community by providing information and a variety of other services benefitting the students, faculty, and the general public.

If the student staff cannot answer your question, they will direct you to the proper person or agency.

STUDENT GOVERNMENTS

Associated Students
Third Floor, Price Center
Mail code 0077
ASUCSD: 534-4450
Hours: 8:00 a.m.– 4:30 p.m. Monday–Friday
Graduate Student Association

Second Floor, Student Center A
Mail code 0353
GSA: 534-6504
Hours: 8:00 a.m.–4:30 p.m. Monday–Friday

The Associated Students Government (ASUCSD) and the Graduate Student Association (GSA) provide students with practical leadership experience in the areas of programming, financial planning, and in the development of programs and services which are designed to meet the students' needs. The ASUCSD operates Assorted Vinyl, ASIO, Grove Caffe, Lecture Notes, Soft Reserves, U.S. Grants, and the Volunteer Connection. The ASUCSD also sponsors a wide variety of programming,
including concerts, films, and festivals. The GSA takes a pro-active 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 AS and the GSA in providing logistical, accounting, and programmatic advice. The student leaders and the staff of the ASUCSD, the GSA, 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
(619) 534-4090

The University Events Office is a central resource for programming of events and activities at UCSD. The office hosts over one hundred events annually. It provides the campus and community with programs in the areas of internationally acclaimed dance, drama, chamber music, speakers, popular entertainment and the San Diego Film Festival. All programs are presented in conjunction with student commitees 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. Administration of the Master Calendar for Public Events provides a clearinghouse for all public events.

STUDENT ORGANIZATIONS AND LEADERSHIP OPPORTUNITIES

Price Center
Mail code 0078
(619) 534-0501

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 250 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 third floor of the Price Center to learn more about student organizations and leadership opportunities!

Veterans' Affairs

Building 201 University Center
Mail code 0013
(619) 534-3971

ELIGIBILITY

The following persons may be eligible for federal veterans' educational benefits:

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.
2. A person who entered active duty for the first time after June 30, 1985, and served continuously for three years.
3. Persons who have a six-year obligation to serve in the Selected Reserve signed after June 30, 1985.
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. Applicants income, including support received from parents, cannot exceed $7,000 annually. Student cannot be over 27 years of age.

OTHER SERVICES

In addition to certifying paperwork to initiate a student's veterans' benefits, the Office of Veterans' Affairs 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 Veterans' Affairs Office to request certification of VA educational benefits.

UCSD Alumni Association

202 University Center
Mail code 0083
(619) 534-3900
e-mail: alumassoc@ucsd.edu

The UCSD Alumni Association was founded in 1972 with a grant from the University of California Board of Regents to promote the university as an exceptional institution of higher education through alumni involvement.

Today, the association co-sponsors and provides funds for the National Merit Scholarship program, honors distinguished alumni and fac-

ulty, provides student and alumni career programs, and educational and professional seminars, develops regional clubs, and actively supports alumni legislative advocacy programs affecting higher education.

Members of the UCSD Alumni Association enjoy free library privileges at all UC libraries, a discount at the Career Services Center, networking and volunteer opportunities, travel programs, a quarterly subscription to *UCSD Perspectives,* discount cards for a variety of services, and a membership newsletter. In partnership with the Office of Student Affairs, the Alumni Association now offers two-year student memberships with a variety of special discounts and benefits.

Art Galleries

UNIVERSITY ART GALLERY

Mandeville Center, Room 101
Mail code 0327
(619) 534-2864

The University Art Gallery presents six 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. Exhibitions last year included: *Ross Bleckner 1985–1995; After Art: Rethinking 150 Years of Photography;* and *The Music Box Project.*

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 0327

The new six-building complex, which opened January 1993, houses the Visual Arts Graduate Gallery. First-year review shows and M.F.A. exhibitions will be mounted each week of the quarter. Hours may vary. There is no admission charge.

Crafts Center

Mail code 0338
(619) 534-2021

Located in the center of the campus, the Crafts Center offers studio and art/crafts instructional facilities in ceramics, photography, jewelry, drawing, neon, 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 (619) 534-2021.

Day Care Center

Mail code 0962
(619) 534-2768

The UCSD Early Childhood Education Center serves the children of students, staff, and faculty. Age requirements are eleven months and walking to age five and one-half. State and Federal 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 center's office at (619) 534-2768 between 8:00 a.m. and 4:30 p.m.

As an alternative, the Infant Toddler Referral Program aids campus families in locating licensed home-care providers from six weeks through preschool ages. For assistance, call (619) 534-2768 during office hours or leave a recorded message for a return call.

Transportation and Parking Services

Mail code 0040
(619) 534-4223

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 or downtown Amtrak station, helping students get home during breaks. For information, route maps, or schedules, please telephone (619) 534-RIDE.

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 low-cost emergency rides home and complimentary parking. For program details, call Transportation Alternatives at (619) 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., and Saturday and Sunday, 10:00 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 and applications can be obtained at the Parking Office. A parking application form is also included in student packets. If you plan to park on campus, please return it by the indicated deadline.

Student spaces are defined by yellow lines. A student ("S") parking permit is valid in these yellow-striped spaces at all times. After 4:30 p.m. on weekdays and all day Saturday and Sunday, all UCSD permits are upgraded and become valid in spaces marked with green or red squares, as well as in metered (no fee required) spaces. 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 supports many other vehicle related services to a great variety of campus users, including the maintenance and operation of a fleet of vehicles which are leased or rented by campus departments and organizations. T&PS also 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 who are stranded on campus.

If you have questions about T&PS, purchasing a permit, or parking at UCSD, please telephone a service representative at (619) 534-4223.

UCSD Quick Copy Centers

Campus Services Complex, Bldg. A
Mail code 0031
(619) 534-3020

A variety of copying and binding services are provided, including high-speed duplication, color copies, and self-serve copy machines.

Binding services, comb, tape, or glue binding are available, in addition to lamination and padding. Many paper and cover stocks are available.

Self-serve copiers are located at the AP&M Building and University Center loactions. Facsimile services are also available at University Center Quick Copy in Building 201.

Quick Copy locations are:

- Applied Physics and Math Bldg., Room #3301, (619) 534-2197
- Basic Science Bldg., Room 3001A, (619) 534-3947
- Campus Services Complex, Bldg. A, (619) 534-3020
- University Center, Bldg. 201, (619) 534-7050

Student Mail Services

Campus Services Complex, Bldg. A
Mail code 0047
(619) 534-7098

The Student Mail Services provides Monday through Saturday distribution of mail to resident students during the academic year. Hours of operation are 8:00 a.m. to 4:30 p.m. Stamps and various other U.S. Postal commodities can be purchased and international items can be mailed at this location.

UCSD Bookstore

Price Center
Mail code 0008
(619) 534-READ (7323)
Fax: (619) 534-0565
E-mail: bookorder@ucsd.edu
Telnet: ucsdbkst.ucsd.edu
Toll-free ordering: (800) 520-7323
Internet: http://www-bookstore.ucsd.edu

In addition to required textbooks and reading materials, the UCSD Bookstore makes available an extensive selection of general, medical and technical books, including academic and scholarly titles, UCSD faculty authors, literature, reference, and bestsellers. Computers, computer supplies, software, and a computer repair service are provided for the campus community. The bookstore also stocks a full line of school and office supplies, electronic calculators, art and engineering supplies, and medical instruments. Hours are 8:00 a.m. to 6:00 p.m. Monday through Friday, Saturday 10:00 a.m. to 5:00 p.m., with extended hours during rush periods in the first two weeks of every quarter.

UCSD DOWNTOWN CENTER BOOKSTORE

One America Plaza
600 West Broadway
San Diego, CA 92101
(619) 525-0058
Fax: (619) 525-0059
Internet: http://www-bookstore.ucsd.edu

The Downtown Center Bookstore offers extension students and downtown San Diegans access to over 140,000 titles. Course materials are available as well as countless medical and technical titles, law books, business books, children's books, and bestsellers. Special orders are always welcome for any title in print in the United States. Conveniently located on the street level of the One America Plaza building, the bookstore also stocks school and office supplies, UCSD insignia gifts and clothing, and information about the La Jolla campus. Hours are 9:00 a.m. to 6:00 p.m., Monday through Friday.

SUNSHINE STORE

Price Center
Mail code 0008
(619) 534-2875

The Sunshine Store carries snacks, sundries, school supplies, and newspapers. Film and film processing are also available. Hours are 7:00 a.m. to 8:00 p.m. Monday through Friday; Saturday 10:00 a.m. to 5:00 p.m.; Sunday 11:00 a.m. to 5:00 p.m.

REVELLE SUNDRY STORE

Blake Hall, Revelle campus
Mail code 0311
(619) 534-2035

The Revelle Sundry Store offers snacks, gifts and greeting cards, school supplies, and film and film processing. Hours are 7:30 a.m. to 8:00 p.m. Monday through Thursday, and 7:30 a.m. to 5:00 p.m. Friday.

CHECK CASHING (THREE LOCATIONS)

With proper identification, students may cash checks up to $50 for a small charge at the Central Cashier's Office, Building 401 University Center, (Hours: Monday through Friday, 9:00 a.m.–3:00 p.m.), and the Central Box Office, Price Center (Hours: Monday through Friday, 10:00 a.m. to 2:00 p.m.).

With required identification, students may cash personal checks up to $50 for a nominal charge at the UCSD Bookstore (Hours: Monday through Friday, 8:00 a.m. to 6:00 p.m. and Saturday, 10:00 a.m. to 5:00 p.m.) and the Revelle Sundry Store (Hours: Monday through Friday, 7:30 a.m. to 8:00 p.m.).

University Police Department

Building 500 University Center
Mail code 0017
EMERGENCY, DIAL 9-1-1
Business, (619) 534-4357

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 security guards during the evening and early morning hours.

CRIME PREVENTION PROGRAM

(619) 534-3644

The Police Department's Crime Prevention Program offers a variety of information to the campus community on crime prevention meth-

ods. Pamphlets and informative seminars are available.

CAMPUS PROTECTION ASSISTANT PROGRAM

(619) 534-9255

CPAs are students employed by the UCSD Police Department. They provide security for campus events and facilities. Call for more information.

COMMUNITY SERVICE OFFICER PROGRAM

(619) 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 ESCORT program, which is available every evening from 6:00 p.m. to 1:00 a.m.

LOST AND FOUND

(619) 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 0324
(619) 534-2052

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 3:45 p.m. P.O. Box rentals are available in various sizes. Stamp purchases from stamp vending machines are available Monday–Friday, 8:30 a.m. to 7:00 p.m.

Research at UCSD

Members of organized research institutes and centers carry out advanced research projects, often spanning the areas of knowledge encompassed by several academic departments, and provide opportunities for graduate student support in broad disciplines. The study programs of graduate students supported by institutes and centers are administered by the academic departments in which the students are enrolled. 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, and the San Diego Supercomputer Center.

Universitywide Institutes/ Organized Research Units

California Space Institute (Cal Space), headquartered at Scripps Institution of Oceanography, was established in 1979 as a multicampus organized research unit of the University of California (UC). It supports and conducts pure and applied space-related science and technological research and development throughout the UC system. 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. CalSpace collaborates with the Climate Research Division and other divisions at Scripps to study complex geophysical and biochemical interactions and feedbacks that link the components of the climate system, including the atmosphere, oceans, and 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 CalSpace researchers.

Minigrant program–distribution of small research grants for investigations in the fields of space science and engineering, astronomy and astrophysics, satellite remote sensing, climate and global change. The program is open to all researchers in the UC system. It is designed to provide seed money to explore and develop new areas of research and particularly encourages proposals that involve graduate students or postgraduate researchers.

Education–promotion of undergraduate and graduate education in the interdisciplinary fields of climate and global change, and space science and engineering. The CalSpace-led state-wide consortium (California Space Grant Consortium) was designed 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. 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. The institute operates a global network of thirty 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 southern California network of Global Positioning System (GPS) satellite geodetic sites; an array of ocean bottom seismographs; and telemetered seismic arrays in Turkministan, Kirghizia, and Anza, 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. 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 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)** was founded in 1983 as a multicampus research unit serving the entire University of California (UC) system, including the UC-managed National Laboratories. The institute's purpose is to study the causes of international conflict and

the opportunities to resolve it through international cooperation. During IGCC's first five years, research focused largely on the issue of averting nuclear war through arms control and confidence-building measures between the superpowers. Since then the research program has diversified to encompass several broad areas of inquiry: regional relations, international environmental policy, international relations theory, and most recently, the domestic sources of foreign policy.

IGCC serves as a liaison between the academic and policy communities, injecting fresh ideas into the policy process, establishing the intellectual foundations for effective policymaking in the post-Cold War environment, and providing opportunities and incentives for UC faculty and students to become involved in international policy debates. Scholars, researchers, government officials, and journalists from the United States and abroad participate in all IGCC projects, and IGCC's publications—books, policy papers, and semiannual newsletter—are widely distributed to individuals and institutions around the world.

In addition to projects undertaken by the central office at UC San Diego, IGCC supports graduate and faculty research, instructional programs, and public education throughout the UC system. The institute receives financial support from the regents of the University of California and the State of California, and has been awarded grants by such foundations as Ford, MacArthur, Hewlett, Rockefeller, W. Alton Jones, Plough-shares, the Rockefeller Brothers Fund, the United States Institute of Peace, The Pew Charitable Trusts, the Japan-U.S. Friendship Commission, and from the U.S. Dept. of Energy.

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 on a 10,000 vertical foot 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, conservation and natural resource management, geological 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 and laboratory at Crooked Creek (10,150 feet altitude), which will accommodate up to fifty people when six small cabins are completed, (3) the Nello Pace Laboratory and Mount Barcroft facilities (12,470 feet altitude) which accommodate thirty-five people in dormitories, and (4) the 450 square foot Summit Laboratory located on White Mountain peak (14,246 feet altitude), and is the highest research lab in North America.

WMRS hosts more than 1,000 users from over 100 institutions per year for research, teaching and conferences. Research is most intensive in the summer and involves students supported by WMRS Fellowships, UC faculty supported by WMRS Research Grants, and faculty from other universities around the world. Educational uses include several geology field courses and a new UC intercampus field course in Environmental Biology with the students in residence for an academic quarter. WMRS hosts annual professional society meetings and has published proceedings from biennial symposia on the natural history of the region over the past several years.

Campuswide Institutes

The **Institute for Biomedical Engineering (IBME)** was established in 1991 with the aim of promoting and coordinating interdisciplinary interactions among UCSD faculty and students at the interface of engineering, biology, and medicine. Members of the institute include more than eighty faculty and research scientists from the School of Engineering, the School of Medicine, other departments on the main campus and at the Scripps Institution of Oceanography, as well as the Scripps Research Institute, the Salk Institute, and the La Jolla Cancer Research Foundation.

Tissue engineering science is a major research theme of the institute. Under this general theme, principles and methods of engineering and life sciences are applied to elucidate structure-function relationships in normal and pathological tissues, including the mechanisms of control of tissue growth, adaptation and repair, and to develop biological substitutes to restore or improve tissue functions. The tissue engineering sciences pursued in IBME are in three main areas: cardiovascular, somatic, and neuroendocrine tissues. Investigations under cardiovascular tissue engineering science include hypertrophy and remodeling of the heart, stress-growth relationship in blood vessels, stress failure of pulmonary capillaries, modified hemoglobins as blood substitute, structure and function of erythrocytes membranes, and motility and adhesion of leukocytes. Studies on somatic tissue engineering science comprise skin replacement, repair of cartilage defects, effects of stress deprivation on tendon and ligaments, and injury, repair and strengthening of skeletal muscle. Research on neuroendocrine tissue engineering science embodies injury and regeneration of peripheral nerves, somatic cell gene delivery for repair of brain damage, transplantation of retinal pigment epithelium, molecular basis of development and healing of the cochlea, and a biosystems approach to the design of artificial pancreas. These research activities involve interdisciplinary approaches ranging from cellular-molecular biology to tissue, organ and systems levels, with the coupling of quantitative engineering analysis and modern biomedical sciences.

The research and training activities fostered by the institute are related to important medical problems such as heart failure, hypertension, atherosclerosis, pulmonary diseases, shock, inflammation, burns, orthopedic disorders, sports injuries, myopathies, peripheral nerve and brain injuries, age-related blindness, noise injury, and diabetes. The coordinated engineering and biomedical research allows the theoretical analysis of the experimental findings on physiological and pathological processes, thus generating quantitative information and new investigative approaches. The ultimate goal is to improve the methods of prevention, diagnosis, and treatment of diseases. To this end, the institute endeavors to enhance the collaboration between basic science and clinical medicine and the cooperation between academia and industry. An Industrial Affiliates

Program was formed in October 1993 to foster collaborative research, student internship, industrial continuing education, and organization of scientific symposia. There were twelve industrial members as of December 1994.

IBME received a four-year Whitaker Foundation Development Award which began in September 1993. The award is aimed at fostering graduate and postgraduate training in biomedical engineering through the recruitment of new faculty members, granting of student fellowships, establishment of core facilities (including confocal microscopy and flow cytometry), initiation of new educational courses, and holding of workshops, seminars, and symposia.

The **Institute for Neural Computation** has as its goals the understanding of how nervous systems function through direct observation, experimental investigation, and modeling of neural structures. It extends into the field of psychology, where it seeks to uncover cognitive principles through psychological experimentation and parallel-distributed processing models. It will apply these principles of neural computation toward the solution of diverse technological and scientific problems, particularly the building of a new generation of massively parallel computers. The Institute's Neuroengineering Laboratory will pursue applied projects with both scientific and commercial potential, using techniques of pattern recognition and learning that have arisen in artificial neural networks. The institute is multidisci-plinary, with founding members coming from both biological and social sciences as well as engineering. The research areas in which the institute has major projects include motor systems, visual processing, learning and memory, and language modeling.

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 cardiology, mathematics, oceanography, mechanical 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 about twenty-five graduate students to work on Ph.D. dissertations concerned with nonlinear problems. Also associated with INLS are about ten postdoctoral fellows.

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 a major center in the experimental, numerical, and theoretical study of chaos and turbulence in fluid dynamics, investigations in nonlinear polymer science, studies (jointly with the University of California, Berkeley) in the nonlinear stability of fluids and plasmas, investigations of mathematical properties of quasi-conformal mappings, and work on the bifurcation of symmetric systems.

INLS has developed joint research programs with universities, research institutes, and commercial companies in areas of common interest. It actively works with colleagues at MIT and the University of Michigan, at Lockheed Sanders, Inc., Randle Corp., and Mission Research, and with the Institute for Applied Physics in Nizhny Novgorod. 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.

Sam and Rose Stein Institute for Research and Education on Aging advocates an interdisciplinary approach to research on a wide range of phenomena associated with aging. These range from the basic nature of the biological process of aging to the clinical disorders that occur in greater frequency with advanced

age. Alzheimer's disease, as the principal cause of senile dementia, has been designated for highest priority research, with special attention also given to arthritis, cardiovascular disease, and osteoporosis. The following program areas have been identified: immunology, arthritis and genetics; neurosciences; endocrinology and cell biology; atherosclerosis; clinical research; education (aging specific); psycho-socio aspects of aging; and human development and aging.

The UCSD **Cancer Center (CC),** active in the fight against cancer since 1978, is a National Cancer Institute-designated Clinical 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 Genetics, Cancer Prevention and Control, Clinical Investigation and Developmental Therapeutics, Glycobiology, Growth Control, Immunology, and Molecular Virology. Shared resources at the Cancer Center include Biostatistics, Flow Cytometry, Glycobiology, Lab Support, Molecular Biology, Pharmacology, Tissue Bank, Transgenic Mouse Colony, and Clinical Trials.

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 cancer Protocol Outreach Network which provides state-of-the-art protocol treatment opportunities for patients in a broad geographic area within Southern California. Patient care activities of the Cancer Center are located in the Combined Oncology Clinic at the Theodore Gildred Cancer Facility in the Inpatient Oncology Unit at UCSD Medical Center, both located at Hillcrest, and at the Oncology Clinic of the Perlman Ambulatory Care Center adjacent to Thornton Hospital in La Jolla. Basic research activities of the Cancer Center are carried out at the Theodore Gildred Cancer Facility, the 303 University Center building on the La Jolla campus, and a variety of other locations on or adjacent to the La Jolla campus. Members, associate members, and affiliate members of the Cancer Center number more than 120 laboratory investigators and clinical physicians from eleven academic departments. The overall operating budget of the Cancer Center, including contracts, grants, foundation awards and individual gifts, exceeds $25 million a year in direct costs.

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 astrophysics; infrared, optical, and ultraviolet astronomy; solar observational and theoretical studies; X-ray and gamma-ray astrophysics; experimental and theoretical magnetospheric and space plasma physics; radio astronomy 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 Lick Observatory and the Keck Telescopes, and have contributed experiments to many major NASA space missions. 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 $10 million, mostly from federal funding sources.

The Marlar Foundation provides several enhancements to the academic program, including support of the astrophysics and space science library, and funding for a yearly public lecture given by an eminent astrophysicist.

The **Center for Energy and Combustion Research (CECR),** in 1986, replaced and encompassed the **Energy Center,** which was formed in 1972–73 with initiation of graduate research programs and graduate and undergraduate courses on energy production, utilization, conservation, environmental impacts, and policy. Current research directions include energy research as well as combustion science and evaluations of environmental impacts associated with fossil-fuel utilization and fuel cells. These interdisciplinary studies involve faculty members from several UCSD departments. A limited number of graduate research assistantships is available. Applications for graduate study in any of the disciplines covered by CECR should be directed to the chair of the academic department in which graduate study is to be undertaken.

The **Center for Human Information Processing (CHIP)** is a center for the study of brain and cognition. It is composed of four subdivisions, 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 Human Development Division, 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. In addition to these activities, two of these subdivisions house academic programs at UCSD: The Human Development Division houses the **Human Development Program** (an undergraduate program begun in 1995), and the Language Processes Division houses (together with CRL) the **Joint UCSD/SDSU Doctoral Program in Language and Communicative Disorders** (a graduate program due to officially begin in 1996). These two subdivisions, in particular, sponsor active area research meetings as well as focal conferences, workshops, and colloquia, and 'one-time'

courses related to the mission of the ORU and available to the entire university community (the latest was a functional MRI course offered in fall quarter 1995)

The **Laboratory of Comparative Human Cognition** (LCHC) also operates under the auspices of CHIP. From its inception at UCSD in 1978, the focus of the LCHC's theoretical and empirical work has been the role of culture in shaping human development and human cognition. Members of the LCHC elaborate on culture as the species-specific medium of human existence, constituted of systems of artifacts and acting as both a constraint on and a tool kit for human action. Research sites focus on adult work organization, education, and community-based activity systems.

Within psychology, the approach adopted by LCHC is variously referred to as cultural-historical psychology, cultural psychology, or a cultural context approach to mind. It treats the mind as a phenomenon distributed among people and their artifacts, including language and social institutions. This approach is closely linked to social science movements referred to as activity theory, constructivism, and distributed cognition, which ground their analyses in people's everyday culturally organized activities.

Current research projects are grouped around five major areas: (1) the creation of experimental educational activities in community settings; (2) investigation of cultural and linguistic factors in cognitive and social development; (3) computer networking and joint activity; (4) intervention studies of work and expertise; and (5) analyses of discourse and representation. 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 conference called XLCHC which currently includes more than 400 researchers from sixteen countries. The LCHC conducts a weekly seminar and workshops focused on special topics.

The **Center for Iberian and Latin American Studies (CILAS)** coordinates and promotes Latin American and Iberian research, teaching, and service activities for faculty and students in all departments at the university. It sponsors multidisciplinary colloquia, conferences, projects and publications, as well as library expansion and outreach efforts. The center also hosts visiting faculty. It awards fellowships each year to promising Latin Americanist graduate students. The U.S. Department of Education has designated CILAS, in consortium with the Latin American Center at San Diego State University, as a National Resource Center for Latin American Studies.

The **Center for Magnetic Recording Research (CMRR),** founded in 1983, is devoted to multidisciplinary teaching and research in areas of science and engineering related to magnetic recording. As part of its mission to educate future leaders in this vital technology, the center, in cooperation with the Departments of Physics, Chemistry, Computer Science and Engineering, Electrical and Computer Engineering, and Applied Mechanics and Engineering Sciences, offers classes at both the undergraduate and graduate levels in order to expose students to the concepts of magnetic recording and encourages graduate-level study. In addition, the center assists in the continuing education of professionals already in the field through workshops and seminars. CMRR also stimulates and supports research related to magnetic recording, especially the development of techniques to increase the storage capacity of magnetic recording devices.

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 focus integrates basic science, including work on model developmental systems, with clinical applications aimed at understanding the molecular bases of human diseases. The latest techniques of gene isolation, gene manipulation (including control of gene expression), and the genetic transformation of cells and organisms are further developed and applied to major problems in biology and medicine. The center serves as a resource for the entire campus for molecular genetic techniques, materials, and facilities, and it encourages interactions with other ORUs in the biomedical area.

The center also strives to promote interactions between laboratories at UCSD and the biotechnology community and to facilitate the prompt and orderly transfer of new information resulting from innovative research into the private sector. The center reaches out to its supporters in the biotechnology and biopharmaceutical sectors through its industrial affiliates program, Biotechnology InCyte. This unique program brings together scientists, business executives, and lawyers from both the for-profit and not-for-profit sectors of the industry to participate in a variety of meetings, conferences, and symposia throughout the year.

The **Center for Research in Computing and the Arts (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.

In this context, "artist" is understood to include, but not be limited to, practitioners and theorists in architecture, dance, literature, music, poetry, theatre, and the visual arts. "Scientists and technologists" are similarly understood to include researchers in cognitive science, computer science, engineering, linguistics, mathematics, physics, and psychology.

The center has two closely related goals. One is the discovery, evaluation and development of new conceptual modes, drawing on the most productive aspects of the intellectual disciplines of all its members. The other is to further the aims of the arts, science, and technology through the exploration of ways in which the expanding bodies of knowledge invested in each can be used to promote the aims of the others. Research conducted under the auspices of the center is intended to challenge and expand conventional categories under which the results of artistic, scientific, and technological pursuits are understood.

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, sociology, and anthropology.

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 transputer laboratory, extensive equipment for audio recording and analysis, and equipment for psycholinguistic experimentation.

Current research projects include 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; the compilation of a comparative dictionary of the Yuman languages, and the compilation of an Albanian-English dictionary. The center administers an NIH pre- and postdoctoral training grant, "Language, Communication and Brain." CRL has also entered into several institutional agreements with research institutions in Europe, 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 newsletter.

The **Center for U.S.-Mexican Studies (CMS),** established in 1979, is the nation's largest program devoted to the study of Mexico and U.S.-Mexican relations. It supports research in all of 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. The center also studies the history, economy, politics, and social structure of Mexico, and aspects of the U.S. economy and U.S. public policy that affect Mexico.

Through its program of researchers-in-residence, the center each year sponsors the research of twenty to twenty-five predoctoral and postdoctoral scholars and nonacademic specialists, who spend three to ten 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, Latin America, and East Asia. The center's permanent academic staff also conducts long-term studies of political change in Mexico, agricultural modernization in Mexico, Mexican migration to the U.S., domestic interest group politics in U.S.-Mexican relations, and social and economic consequences of North American economic integration. The center publishes much of the research conducted under its auspices.

Each summer, in collaboration with UCSD's American Political Institutions Program, the center conducts a six-week seminar in studies of the United States for twenty to twenty-five Latin American social scientists and nonacademic professionals.

The center's interdisciplinary Seminar on Mexico and U.S.-Mexican Relations, which meets weekly throughout the academic year, and its research library attract leading researchers from throughout the United States, Mexico, and other countries. In addition, several research workshops on specialized subjects are held each year.

The center has a very active public education program, which includes frequent briefings for journalists, business executives, public officials, and community groups.

Laboratories

The **Laboratory for Mathematics and Statistics (LMS)** promotes collaborative research in applied mathematics and statistics. Its members, most of whom belong to the Department of Mathematics, have carried out joint efforts with researchers of the UCSD Cancer Center, the Department of Applied Mechanics and Engineering Sciences, the Department of Economics, the Department of Biology, the Scripps Institution of Oceanography, the Pulmonary Program Project, the Specialized Center for Research on Ischemic Heart Disease, the UCSD Medical Center Regional Burn Center, the Salk Institute, and the HIV Neuropsychiatric Research Center. This research has involved the analysis of time series; the fitting of various models in cell kinetics, neurophysiology, pharmacokinetics, and pulmonary physiology; econometric analysis, the study of gain equalization for amplifiers; the estimation of human risk from suspected environmental carcinogens; computer-aided diagnosis and prognosis in medicine; and various aspects of AIDS research, in particular the analysis of irregular multivariate repeated measures arising in cohort studies on its natural history and epidemiology.

Projects

The goal of the **African and African-American Studies Research Project** 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.

The **American Political Institutions Project (APIP)** was established in 1989 as a center for research and public education on American politics and public policy. Composed of faculty from the Departments of Political Science, Economics, History, Communication, Sociology, and the UCSD Library, the project's primary mission is to stimulate cross-disciplinary research. To this end, APIP sponsors lunch-table seminars and research conferences and assists

scholars in identifying external sources of support, as well as preparing research proposals.

Recognizing the vital role of the university in civic education, the project has also initiated a series of public affairs programs for the campus and surrounding communities.

APIP's collaboration with UCSD's Center for U.S.-Mexican Studies continued in 1995 with the organization of the third annual summer seminar for Latin American scholars and professionals. This six-week program introduces participants from several Latin American nations to the most recent research on U.S. politics, economics, and history and also provides training in survey research and policy analysis.

The **Interactive Instruction Project (IIP)** is devoted to research in the use of modern technology to increase the interactivity of instruction. The intention is to change the nature of instruction from the passive lecture to something that requires effort on the part of the student and something which provides immediate feedback to students as they attempt to learn. Technologies which are being investigated include the use of the World Wide Web, e-mail, virtual classrooms (multiuser virtual environments), intelligent software agents, and advanced user interfaces. Work is being done on the development of tools for course development, course delivery, and course evaluation. Research done at the Interactive Instruction Project is intended to benefit both students who are physically on campus and students whose access to the campus is through computer networks (distance learning).

The **Project in AIDS Research,** established in 1988, is designed to provide a forum for discussion of research in AIDS at the basic and clinical levels. It is hoped that the Project in AIDS Research will provide for planning of collaborative projects, and for education of predoctoral and postdoctoral scholars in AIDS research. An NIH-supported Center for AIDS Research (CFAR) has been established which provides resources to university investigators pursuing AIDS-related research. Grants have been awarded to support a training program of postdoctoral fellows, and a "Center for AIDS Research" award from NIH provides several core facilities and a developmental program that issues small awards to new investigators. A seminar series and other activities have been initiated to facilitate interaction among faculty from over six departments and three geographic locations. A proposal to establish this project as an organized research unit is under review.

The **Project in Biological Structure** was established in 1989 with the objective of forming an ORU to provide an academic research unit for interdisciplinary interaction among faculty and students aimed at promoting and coordinating research and education in biological structure. The goals of the ORU will be complementary to the academic goals of departments of instruction and research, with a major emphasis in bridging the various disciplines on campus related to biological structure. Thus the ORU will facilitate cross-fertilization across established disciplinary lines without disturbing the existing academic structure of the campus.

The proposed ORU will have a broad focus on research in biological structure and related areas. There will be an emphasis placed on understanding tissue, cellular, and supramolecular structure as determined by state-of-the-art advances in biological microscopy and computer-aided image analysis. At the same time, the ORU will focus heavily on the determination of macromolecular structure, function, and design using the techniques of X-ray crystallography, computational chemistry, and nuclear magnetic resonance spectroscopy. Major advances being made locally pertain to the principles and methodologies of advanced microscopic imaging sciences. Major advances in crystallographic data collection, as well as refinement and graphics development, are also a local strength. Both of these efforts are facilitated strongly by the extensive interaction of campus research programs with the San Diego Supercomputer Center (SDSC). We shall continue and expand these efforts by combining with local and national initiatives advancing computer aided computational analysis and graphics to develop new understanding of biological structures ranging in dimensions from tens of microns to Angstroms.

The **Project in Cognitive and Neural Development.** The purpose of the UCSD Project in Cognitive and Neural Development 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, the Salk Institute for Biological Studies, and Children's Hospital Research Center.

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, Applied Mechanics and Engineering Sciences (AMES), 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 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.

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 a panel model of the dynamics of deforestation in the Amazon region and its effect on the local economy. The PEA allows links with workers from other universities in this and other countries. In 1995–96 we had visitors from Europe, Japan and Hong Kong. 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 in Information Engineering** was established in 1993 to unify many separate research efforts in information engineering at UCSD. The project focuses on improved computational methods and information management tools and is facilitating the initiation of several interdisciplinary research programs of academic and industrial significance. Among its current activities are research on and development of technology essential for the libraries of the future and the establishment of laboratories in multimedia computing and intelligent autonomous systems. Researchers from Electrical and Computer Engineering, Computer Science and Engineering, San Diego Supercomputer Center, School of Medicine, and the University Library are participating in the project's research programs.

The **Project on International and Security Affairs (PISA)** is the campus affiliate of the Institute on Global Conflict and Cooperation, a UC systemwide institute housed at UCSD. PISA purposes are to encourage research, teaching, and public discussion of international affairs. It sponsors seminars and lectures for the faculty and public on international issues. It sponsors workshops to bring together faculty and graduate students across campus units to discuss key research issues in the field. It hosts a colloquium series for all graduate students interested in doctoral research in the field of international affairs. The students are encouraged to present their dissertation projects at these meetings. The project plans conferences with other campus organizations on the future of San Diego in the world economy.

The **Project in Law and Behavioral Sciences (LABS)** was established in 1994. It brings together scholars from many fields for the purpose of crafting effective solutions to contemporary problems. Its active membership includes traditional legal scholars, practicing attorneys, economists, political scientists, moral philosophers, historians, cognitive scientists, medical doctors, and natural scientists. From a multi-disciplinary research group that is making specific recommendations to the California Constitution Revision Commission to a group that is studying the role that scientific testimony can and should play in judicial decision-making, LABS has just begun to bring prominent thinkers together in unique, dynamic, and widely-anticipated interactions.

LABS uses several mediums to convert its intellectual resources into valued advice. First, it encourages research in multidisciplinary legal studies by providing a resource base for such study. Second, it sponsors focused research groups on topics including comparative regulatory policy, interactions between the cognitive and social sciences, jury decision-making, and political and economic reform in eastern Europe and the former Soviet Union. Third, the project provides a resource base for community service and sponsors community outreach programs. Such programs are designed to be valuable to government, the legal community, and interested members of the general public.

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 reserves in the system for serious academic pursuits. The San Diego campus administers the following four reserves:

Dawson Los Monos Canyon Reserve: This 200-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.

Elliott Chaparral Reserve: Located ten miles to the east of campus, this 107-acre reserve, adjacent to the large expanse of Miramar Naval Air Station 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 twenty-acre reserve, together with the city of San Diego's contiguous Northern Wildlife Preserve, constitute the last remaining fifty 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 laboratory facilities, and extensive facilities exist across the Bay at Hubb's Sea World.

Scripps Coastal Reserve: This reserve consists of disjunct shoreline and cliff-top (or "knoll") portions. The shoreline part consists of the sixty-seven acre San Diego Marine Life Refuge extending seaward 1,000 feet from the beach and an 800-acre contiguous submerged lands lease. Surrounding the Scripps Pier, habitats include sandy beach and submerged plain, 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. This reserve is enhanced by the availability of the laboratories and facilities of nearby Scripps Institution of Oceanography and the main San Diego campus.

Campuswide Research Facilities

Academic Computing Services

See page 99.

San Diego Supercomputer Center

See page 101.

The UCSD Libraries

See page 106.

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 com-munity. 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 thirteen 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 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, labora-tory, and community-based experiences.

UCSD facilities are the main sites for clinical education. UCSD Medical Center-Hillcrest is licensed for 442 beds. The majority of UCSD inpatients are admitted here, 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.

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 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.

San Diego ranks fourth nationally in the biotechnology industry. 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 nearly one-fourth of classes during the first two years and more than one third 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.

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 496 medical students were enrolled in 1993-94.

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 for purchase at the UCSD Bookstore for $2.50, plus $2.50 for shipping and handling (make checks payable to the UC Regents). Send School of Medicine catalog requests to: UCSD Bookstore 0008, University of California, San Diego, 9500 Gilman Drive, La Jolla, California 92093-0008, or for more information, call the UCSD Bookstore at (619) 534-7326.

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
(619) 534-3880

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.

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 outstanding facilities.

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 1,200, including approximately 190 graduate students. The institution's budget is approximately $100 million annually.

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 Ellen Browning Scripps and E.W. Scripps.

Research at Scripps encompasses physical, chemical, biological, geological, and geophysical studies of the oceans. Ongoing investigations include the topography and composition of the ocean bottom, waves and currents, and the flow and interchange of matter between seawater and the ocean bottom or the atmosphere. Scripps's research ships are used in these investigations throughout the world's oceans. Among the more than 300 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 three ships and two platforms for oceanographic research primarily in support of programs by Scripps researchers, although a significant part of their work is for 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, Geosciences Research Division, Marine Biology Research Division, Marine Research Division, and Physical Oceanography Research Division. The diversity of Scripps's work is extended by two special purpose laboratories: the Marine Physical Laboratory and the Center for Marine Biotechnology and Biomedicine. Other specialized groups also are located on campus: the Center for Coastal Studies and the Marine Life Research Group. A ship operations and marine technical support unit provides essential services and facilities to all research units of the institution.

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 the Ph.D. degree. Academic work is conducted through an organizational segment of the institution known as the Graduate Department of SIO and its eight curricular groups: biological oceanography, physical oceanography, marine biology, geological sciences, geochemistry/marine chemistry, geophysics, climate sciences, and applied ocean sciences. Approximately eighty professors are complemented by an academic staff of more than 150 research scientists, many of whom have a regularly scheduled role in the instructional program.

The Stephen Birch Aquarium-Museum provides a wide variety of educational courses in the marine sciences for students from primary grades to high school level. UCSD students also 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-museum 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 oceanographic concepts and explain research undertaken at Scripps. The aquarium-museum is open from 9:00 a.m. to 5:00 p.m. daily.

The La Jolla Laboratory of the University of California's Institute of Geophysics and Planetary Physics, and UC's California Space Institute, although organizationally separate, are closely affiliated with Scripps. The California Sea Grant College, 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.

Students enter oceanography with extremely varied interests and backgrounds–naturalists, explorers, engineers, and theorists from the United States and from 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. A hydraulics laboratory features a unique ninety-foot stratified wave-and-current channel, and an analytical facility has a host of 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 three research vessels as well as those from other oceanographic institutions.

The combination of the 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), 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.) and a Ph.D. in international affairs. 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. program offers a program of study that assures competence in students' major field, in their minor field, and in Pacific region policy issues. Major and minor fields are selected from international relations, international economic policy and management, and comparative policy analysis.

1. Major field: Students must acquire superior knowledge of the literature of the major field and develop research skills needed to do advanced work in their field;
2. Minor field: Students must acquire substantial knowledge of the literature of the minor field and develop some ability to bring that knowledge to bear in research activities;
3. Pacific region policy issues: Students must further develop substantial ability to analyze comparatively the policy issues of the Pacific region and to understand the historical and cultural roots of these issues.

Ph.D. students will be required to demonstrate knowledge of advanced quantitative methods or a foreign language, depending on individualized courses of study.

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. program offers an interdisciplinary 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 policymakers and private managers. Despite these differences, the same faculty will 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, linguistics, management sciences, international relations, comparative politics, and public policy. 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.

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Irons, Peter H.	Professor	Political Science	Marshall
Irwin, Michael	Professor-in-Residence	Psychiatry	SchMed
Jackson, Gabriel	Professor Emeritus	History	Revelle
Jacobson, Gary C.	Professor	Political Science	Marshall
Jain, Ramesh C.	Professor	ECE	Roosevelt
James, Luther	Professor Emeritus	Theatre	Muir
Jameson, Kimberly	Assistant Professor	Psychology	Roosevelt
Jed, Stephanie H.	Associate Professor	Literature	Muir
Jenkins, Elizabeth	Assistant Professor	Physics	Muir
Jennings, Patricia	Assistant Professor	Chemistry and Biochemistry	Roosevelt
Jernigan, Terry L.	Professor-in-Residence	Psychiatry/Radiology	SchMed
Jeste, Dilip V.	Professor-in-Residence	Psychiatry/Neurosciences	SchMed
Johnson, Chalmers	Professor Emeritus	IRPS	IRPS/Roosevelt
Johnson, Randell	Assistant Professor	Biology	Marshall
Jolley, S. Nicholas	Professor	Philosophy	Revelle
Jones, Barbara	Professor	Physics	Muir
Jones, Walton	Professor	Theatre	Muir
Jordan, David K.	Professor/Provost	Anthropology/Warren	Warren
Judd, Lewis L.	Professor	Psychiatry	SchMed
Jules-Rosette, Bennetta W.	Professor	Sociology	Muir
Kadonaga, James T.	Professor	Biology	Revelle
Kagnoff, Martin F.	Professor	Medicine	SchMed
Kahler, Miles E.	Professor	IRPS	IRPS/Roosevelt
Kahr, Madlyn M.	Professor Emeritus	Visual Arts	Warren
Kamen, Martin D.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Kane, Alex	Professor	IRPS	IRPS/Roosevelt
Kaplan, Robert M.	Professor	Fam/Prev Medicine	SchMed
Kaprow, Allan	Professor Emeritus	Visual Arts	Warren
Karbhari, Vistasp M.	Assistant Professor	AMES	Muir
Karin, Michael	Professor	Pharmacology	SchMed

Karis, Aleck	Professor	Music	Warren
Karpishin, Timothy	Assistant Professor	Chemistry and Biochemistry	Warren
Karten, Harvey J.	Professor	Neurosciences/Psychiatry	SchMed
Kastner, Miriam	Professor	SIO	SIO/Revelle
Katzman, Robert	Professor Emeritus	Neurosciences	SchMed
Kavanagh, Karen L.	Associate Professor	ECE	Roosevelt
Kayali, Hasan	Assistant Professor	History	Roosevelt
Kearns, David R.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Keeling, Charles D.	Professor	SIO	SIO
Keeling, Ralph F.	Assistant Professor	SIO	SIO
Kelly, Carolyn J.	Associate Professor-in-Residence	Medicine	SchMed
Kelner, Michael J.	Associate Professor	Pathology	SchMed
Kernell, Samuel H.	Professor	Political Science	Warren
Keyssar, Helene	Professor	Communication	Marshall
Kim, Taekwon	Assistant Professor	IRPS	IRPS
Kipps, Thomas J.	Professor	Medicine	SchMed
Kirkland, Theo N.	Associate Professor-in-Residence	Pathology/Medicine	SchMed
Kirkpatrick, Susan	Professor	Literature	Muir
Kirsch, David J.	Associate Professor	Cognitive Science	Roosevelt
Kitcher, Patricia W.	Professor	Philosophy	Muir
Kitcher, Philip S.	Professor	Philosophy	Revelle
Klatch, Rebecca E.	Associate Professor	Sociology	Muir
Klein, Rachel	Associate Professor	History	Warren
Kleinfeld, David	Associate Professor	Physics	Warren
Klima, Edward S.	Professor Emeritus	Linguistics	Muir
Kluender, Robert E.	Assistant Professor	Linguistics	Warren
Ko, Dorothy	Associate Professor	History	Muir
Kohn, Joshua R.	Assistant Professor	Biology	Warren
Komives, Elizabeth A.	Assistant Professor	Chemistry and Biochemistry	Roosevelt/SchMed
Konecni, Vladimir J.	Professor	Psychology	Muir
Kontje, Todd C.	Associate Professor	Literature	Marshall
Kooyman, Gerald L.	Professor-in-Residence	SIO	SIO
Kosmatka, John B.	Associate Professor	AMES	Warren
Krause, Lawrence B.	Professor	IRPS	IRPS/Roosevelt
Krauss, Ellis S.	Professor	IRPS	IRPS
Kraut, Joseph	Professor Emeritus	Chemistry and Biochemistry	Revelle
Kreutz-Delgado, Kenneth	Associate Professor	ECE	Warren
Kripke, Daniel F.	Professor-in-Residence	Psychiatry	SchMed
Kristan, William B., Jr.	Professor	Biology	Marshall
Kroll, Norman M.	Professor Emeritus	Physics	Revelle
Kronick, Richard G.	Assistant Professor	Fam/Prev Medicine	SchMed
Ku, Walter H.	Professor	ECE	Revelle
Kube, Paul R.	Assistant Professor	CSE	Marshall
Kuczenski, Ronald T.	Professor-in-Residence	Psychiatry	SchMed
Kulik, James A.	Professor	Psychology	Warren
Kummel, Andrew C.	Associate 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	Chemistry and Biochemistry	Warren
Lake, David A.	Professor	Political Science	Marshall

Lakoff, Sanford A.	Professor Emeritus	Political Science	Warren
Lal, Devendra	Professor	SIO	SIO
Lampland, Martha	Associate Professor	Sociology	Roosevelt
Lane, Thomas A.	Professor	Pathology	SchMed
Langacker, Ronald W.	Professor	Linguistics	Revelle
Langdon, Margaret H.	Professor Emeritus	Linguistics	Warren
Larsen, Susan	Assistant Professor	Literature	Roosevelt
Larson, Philip C.	Associate Professor	Music	Roosevelt
Lasheras, Juan C.	Professor	AMES	Marshall
Lau, Silvanus S.	Professor	ECE	Muir
Lawder, Standish D.	Professor Emeritus	Visual Arts	Warren
Ledden, Patrick J.	Sr. Lecturer (SOE)/Provost	Mathematics/Muir	Muir
Lee, Edward N.	Professor Emeritus	Philosophy	Revelle
Lee, Sing H.	Professor	ECE	Muir
Leffert, Hyam L.	Professor	Pharmacology	SchMed
Lehmann, Bruce N.	Professor	IRPS	IRPS
Lepore, Jill	Assistant Professor	History	Warren
Lettau, Reinhard	Professor Emeritus	Literature	Revelle
Levin, Lisa	Professor	SIO	SIO
Levin, Paula	Lecturer (SOE)	Teacher Education Program	Marshall
Levine, Fred	Assistant Professor-in-Residence	Pediatrics	SchMed
Levine, Herbert	Professor	Physics	Marshall
Levine, Michael	Professor	Biology	Warren
Levy, Robert I.	Professor Emeritus	Anthropology	Muir
Levy, Thomas E.	Professor	Anthropology	Revelle
Lewak, George J.	Professor Emeritus	ECE	Muir
Lewin, Ralph A.	Professor Emeritus	SIO	SIO
Lewis, George	Professor	Music	Marshall
Libby, Paul A.	Professor Emeritus	AMES	Revelle
Lieber, Richard L.	Professor	Orthopaedics	SchMed
Liebermann, Leonard N.	Professor Emeritus	Physics	Revelle
Lijphart, Arend	Professor Emeritus	Political Science	Revelle
Lin, James P.	Professor	Mathematics	Muir
Lin, Shao-Chi	Professor Emeritus	AMES	Revelle
Lin, Ting-Ting Y.	Assistant Professor	ECE	Muir
Lindblad, Hans	Associate Professor	Mathematics	Roosevelt
Lindenberg, Katja	Professor	Chemistry and Biochemistry	Marshall
Lindsley, Dan L.	Professor Emeritus	Biology	Revelle/SchMed
Ling, Ting-Ting	Assistant Professor	ECE	
Lipsitz, George	Professor	Ethnic Studies	Marshall
Liu, John H. K.	Associate Professor-in-Residence	Ophthalmology	SchMed
Livingston, Robert B.	Professor Emeritus	Neurosciences	SchMed
Lonidier, Fred S.	Associate Professor	Visual Arts	Revelle
Lonsdale, Peter F.	Professor	SIO	SIO
Loomis, William F., Jr.	Professor	Biology	Revelle
Lovberg, Ralph H.	Professor Emeritus	Physics	Revelle
Lowe, Lisa	Associate Professor	Literature	Muir
Luco, J. Enrique	Professor	AMES	Marshall
Luft, David S.	Professor	History	Revelle
Lugannani, Robert	Professor	ECE	Warren
Luhrmann, Tanya M.	Associate Professor	Anthropology	Muir
Lumpkin, Oscar J.	Associate Professor	Physics	Revelle
Luo, Huey-Lin	Professor	ECE	Muir
Lupia, Arthur W.	Assistant Professor	Political Science	Marshall

Lyon, James K.	Professor Emeritus	Literature	Roosevelt
Lytle, Cecil W.	Professor/Provost	Music/Marshall	Marshall
MacConnel, Kim R.	Professor	Visual Arts	Marshall
MacDonald, Gordon	Professor	IRPS	IRPS
Macdougall, J. Douglas	Professor	SIO	Revelle/SIO
Machina, Mark J.	Professor	Economics	Revelle
MacIntyre, Andrew	Associate Professor	IRPS	IRPS
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
Malhotra, Vivek	Associate Professor	Biology	Revelle
Manaster, Alfred B.	Professor	Mathematics	Revelle
Mandell, Arnold J.	Professor Emeritus	Psychiatry	SchMed
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
Maple, M. Brian	Professor	Physics	Revelle
Mares, David R.	Associate Professor	Political Science	Muir
Marino, John A.	Associate Professor	History	Revelle
Mariscal, George L.	Associate Professor	Literature	Warren
Markenscoff, Xanthippe	Professor	AMES	Revelle
Marquardt, Diana L.	Associate Professor-in-Residence	Medicine	SchMed
Marshall, Margaret C.	Senior Lecturer (SOE)	Theatre	Marshall
Marth, James D.	Associate Professor	Medicine	SchMed
Marti, Kurt	Professor	Chemistry and Biochemistry	Revelle
Martin, Wayne M.	Assistant Professor	Philosophy	Muir
Marzullo, Keith	Associate Professor	CSE	Marshall
Masek, George E.	Professor Emeritus	Physics	Revelle
Masliah, Eliezer	Associate Professor-in-Residence	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, Andrew	Professor	Chemistry and Biochemistry/ Pharmacology	Revelle/SchMed
McCubbins, Mathew D.	Professor	Political Science	Marshall
McCulloch, Andrew D.	Associate Professor	Bioengineering	Muir
McCurry, Stephanie	Associate Professor	History	Warren
McDaniel, Timothy L.	Professor	Sociology	Roosevelt
McDonald, Marianne	Professor	Theatre	Revelle
McElroy, William D.	Professor Emeritus	Biology	Revelle
McGinnis, William J.	Professor	Biology	Marshall
McGowan, John A.	Professor Emeritus	SIO	SIO
McGuire, Shirley	Assistant Professor	Psychology	Roosevelt
McIlwain, Carl E.	Professor Emeritus	Physics	Revelle
McKenzie, Craig R.M.	Assistant Professor	Psychology	Revelle
McKittrick, Joanna M.	Associate Professor	AMES	Warren
McMillan, R. John	Professor	IRPS	IRPS/Roosevelt
McMorris, Trevor C.	Professor	Chemistry and Biochemistry	Marshall

Meeker, Michael E.	Professor	Anthropology	Revelle
Mehan, Hugh B., Jr.	Professor/Director	Sociology/TEP	Marshall
Mellon, Pamela	Professor	Repro Med/Neurosciences	SchMed
Melville, Wallace K.	Professor	SIO	SIO
Mendis, D. Asoka	Professor Emeritus	ECE	Muir
Meranze, Michael	Associate Professor	History	Marshall
Metzger, Thomas A.	Professor Emeritus	History	Muir
Meyer, Ursula	Lecturer (SOE)	Theatre	Warren
Meyers, Marc A.	Professor	AMES	Revelle
Middleman, Stanley	Professor	AMES	Warren
Miles, John W.	Professor Emeritus	AMES	Warren/SIO
Miller, Arnold L.	Professor	Neurosciences	SchMed
Miller, David R.	Professor/Associate Dean	AMES/School of Engineering	Revelle
Miller, Stanley L.	Professor	Chemistry and Biochemistry	Revelle
Mills, Stanley E.	Professor Emeritus	Biology	Muir
Milstein, Laurence B.	Professor	ECE	Warren
Minster, Jean-Bernard	Professor	SIO	SIO
Mitchell, Allan	Professor Emeritus	History	Roosevelt
Mitchell, Sandra D.	Associate Professor	Philosophy	Revelle
Miyai, Katsumi	Professor	Pathology/Medicine	SchMed
Miyoshi, Masao	Professor	Literature	Marshall
Moerner, William	Professor	Chemistry and Biochemistry	Revelle
Montal, S. Mauricio	Professor	Biology	Revelle
Monteon, Michael P.	Associate Professor	History	Muir
Montrose, Louis A.	Professor	Literature	Revelle
Moore, F. Richard	Professor	Music	Revelle
Moore, James J.	Associate Professor	Anthropology	Warren
Moore, John C.	Assistant Professor	Linguistics	Muir
Moore, Stanley W.	Professor Emeritus	Philosophy	Revelle
Mosshammer, Alden A.	Professor	History	Revelle
Movellan, Javier R.	Assistant Professor	Cognitive Science	Warren
Mukerji, Chandra	Professor	Sociology/Communication	Marshall
Mullin, Michael M.	Professor/Associate Dean	SIO	SIO
Munk, Walter H.	Professor Emeritus	SIO	SIO/Warren
Murakami, Hidenori	Professor	AMES	Revelle
Murre, Cornelius	Associate Professor	Biology	Revelle
Myers, Robert R.	Professor-in-Residence	Anesthesiology/Pathology	SchMed
Nachbar, William	Professor Emeritus	AMES	Revelle
Najmabadi, Farrokh	Associate Professor	ECE	Roosevelt
Naughton, Barry	Associate Professor/Associate Dean	IRPS	IRPS
Nee, Thomas B.	Professor Emeritus	Music	Warren
Négyesy, János	Professor	Music	Muir
Nemat-Nasser, Siavouche	Professor	AMES	Revelle
Nesbitt, Muriel N.	Associate Professor	Biology	SchMed/Warren
Neuhouser, Frederick	Associate Professor	Philosophy	Roosevelt
Newman, William A.	Professor	SIO	SIO
Newmark, Leonard D.	Professor Emeritus	Linguistics	Revelle
Newport, John W.	Professor	Biology	Muir
Nguyen-huu, Xuong	Professor	Physics/Biology/Chem and Biochemistry	Revelle/SchMed
Nicolaou, Kyriacos C.	Professor	Chemistry and Biochemistry	Muir
Nierenberg, William A.	Prof/V Chan/Dir Emeritus	SIO/Mar Sci/SIO	SIO
Niiler, Pearn P.	Professor	SIO	SIO

Nodelman, Sheldon A.	Associate Professor	Visual Arts	Warren
Nomura, Keiko	Assistant Professor	AMES	Marshall
Norman, Donald A.	Professor Emeritus	Cognitive Science	Revelle
Northcutt, R. Glenn	Professor	Neurosciences	SchMed/SIO
O'Brien, John S.	Professor	Neurosciences	SchMed
O'Brien, William A.	Associate Professor	Literature	Muir
O'Connor, Daniel T.	Professor-in-Residence	Medicine	SchMed
O'Connor, Joseph M.	Associate Professor	Chemistry and Biochemistry	Marshall
Oesterreicher, Hans K.	Professor	Chemistry and Biochemistry	Muir
Ogdon, Wilbur L.	Professor Emeritus	Music	Muir
Ohman, Mark D.	Associate Professor	SIO	SIO
Okamura, Melvin Y.	Professor	Physics	Revelle
Okikiolu, Kate	Assistant Professor	Mathematics	Revelle
Olafson, Frederick A.	Professor Emeritus	Philosophy	Revelle
Olefsky, Jerrold M.	Professor	Medicine	SchMed
Olfe, Daniel B.	Professor Emeritus	AMES	Revelle
O'Neil, Thomas M.	Professor	Physics	Warren
Ong, Maria E.	Assistant Professor	Mathematics	Roosevelt
Onuchic, José N.	Professor	Physics	Muir
O'Quigley, John	Professor	Mathematics	Muir/SchMed
Orailoglu, Alex	Associate Professor	CSE	Revelle
Orcutt, John A.	Professor	SIO	SIO
Orloff, Marshall J.	Professor	Surgery	SchMed/Muir
Osman, Allen	Assistant Professor	Psychology	Warren
Oxman, Michael N.	Professor	Medicine/Pathology	SchMed
Paar, Hans P.	Professor	Physics	Roosevelt
Padden, Carol A.	Associate Professor	Communication	Marshall
Palade, George	Professor-in-Residence/Dean	Medicine/Sci. Affairs	SchMed
Palenik, Brian	Assistant Professor	SIO	SIO
Palsson, Bernhard O.	Professor-in-Residence	Bioengineering	Warren
Papadimitriou, Christos H.	Professor	CSE	Muir
Papayoanou, Paul A.	Assistant Professor	Political Science	Revelle
Parker, Robert L.	Professor	SIO	SIO
Parra, Max	Assistant Professor	Literature	Marshall
Parrish, Michael E.	Professor	History	Muir
Parry, Christopher N.	Professor	Theatre	Roosevelt
Pashler, Harold E.	Professor	Psychology	Muir
Pasler, Jann C.	Professor	Music	Roosevelt
Pasquale, Joseph	Associate Professor	CSE	Marshall
Pastor, Manuel	Associate Professor	IRPS	IRPS
Patterson, Patricia A.	Professor	Visual Arts	Muir
Paturi, Ramamohan	Associate Professor	CSE	Warren
Pearce, Roy Harvey	Professor Emeritus	Literature	Roosevelt
Penn, Nolan E.	Professor Emeritus	Psychiatry	SchMed
Penner, Stanford S.	Professor Emeritus	AMES	Revelle
Perlmutter, David M.	Professor	Linguistics	Revelle
Perrin, Charles L.	Professor	Chemistry and Biochemistry	Revelle
Peterson, Laurence E.	Professor Emeritus	Physics	Revelle
Peterson, Melvin N. A.	Professor Emeritus	SIO	SIO
Phillips, David P.	Professor	Sociology	Revelle
Phipps-Morgan, W. Jason	Professor	SIO	SIO
Piccioni, Oreste	Professor Emeritus	Physics	Revelle

Piccirilli, Joseph	Assistant Professor	Chemistry and Biochemistry	Marshall
Pickowicz, Paul G.	Professor	History	Muir
Pineda, Jaime A.	Assistant Professor	Cognitive Science	Roosevelt
Pinkel, Robert	Professor	SIO	SIO
Pinon, Ramon, Jr.	Professor Emeritus	Biology	Marshall
Plantamura, Carol	Professor	Music	Revelle
Politis, Dimitris	Associate Professor	Mathematics	Roosevelt
Polyzos, George C.	Associate Professor	CSE	Roosevelt
Pomeroy, Earl	Professor Emeritus	History	Warren
Poo, Mu-Ming	Professor	Biology	Muir
Poole, Fitz John P.	Associate Professor	Anthropology	Muir
Popkin, Samuel L.	Professor	Political Science	Marshall
Posakony, James W.	Professor	Biology	Marshall
Powell, Frank L.	Associate Professor	Medicine	SchMed
Powell, Henry C.	Professor	Pathology	SchMed
Pozrikidis, Constantine	Professor	AMES	Muir
Price, Paul A.	Professor	Biology	Muir
Price, Trevor D.	Associate Professor	Biology	Muir
Priestley, M. J. Nigel	Professor	AMES	Warren
Printz, Morton P.	Professor	Pharmacology	SchMed
Propp, William H.	Associate Professor	History	Muir
Quest, Kevin B.	Professor	ECE	Warren
Rabin, Jeffrey M.	Associate Professor	Mathematics	Revelle
Radcliff, Pamela B.	Assistant Professor	History	Roosevelt
Rafael, Vicente L.	Associate Professor	Communication	Marshall
Ramachandran, Vilayanur S.	Professor	Psychology	Marshall
Ramanathan, Ramachandra	Professor	Economics	Revelle
Ramanathan, Veerabhadran	Professor	SIO	SIO
Ramey, Garey	Associate Professor	Economics	Warren
Ramey, Valerie A.	Associate Professor	Economics	Marshall
Rand, Sinai	Professor Emeritus	AMES	Revelle
Randel, Fred V.	Associate Professor	Literature	Revelle
Rangan, Venkat P.	Associate Professor	CSE	Revelle
Rao, Bhaskar D.	Professor	ECE	Revelle
Rao, Ramesh	Associate Professor	ECE	Revelle
Rapaport, Samuel I.	Professor Emeritus	Medicine/Pathology	SchMed
Rauch, James E.	Associate Professor	Economics	Marshall
Raut, Lakshmi K.	Assistant Professor	Economics	Warren
Rearden, C. Anne	Professor	Pathology	SchMed
Reid, Joseph L.	Professor Emeritus	SIO	SIO
Reid, Roddey	Associate Professor	Literature	Muir
Reissner, M. Erich	Professor Emeritus	AMES	Revelle
Remmel, Jeffrey D.	Professor	Mathematics	Muir
Renn, Scot R.	Assistant Professor	Physics	Revelle
Reynolds, Edward	Professor	History	Marshall
Reynolds, Roger L.	Professor	Music	Muir
Rhodes, Jane	Assistant Professor	Ethnic Studies	Marshall
Richman, Douglas D.	Professor-in-Residence	Pathology/Medicine	SchMed
Rickett, Barnaby J.	Professor	ECE	Muir
Ricles, James M.	Assistant Professor	AMES	Muir
Ride, Sally K.	Professor	Physics	Marshall
Rincon, Patricia A.	Lecturer (SOE)	Theatre	Roosevelt

Ringgold, Faith	Professor	Visual Arts	Muir
Ringrose, David R.	Professor	History	Revelle
Rinott, Yosef	Professor	Mathematics	Revelle
Roberts, Veronica J.	Assistant Professor	Reproductive Medicine	SchMed
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	Assistant Professor	Sociology	Roosevelt
Rosenblatt, Murray	Professor Emeritus	Mathematics	Muir
Rosenblatt, Richard H.	Professor	SIO	SIO
Rosenbluth, Marshall N.	Professor Emeritus	Physics	Roosevelt
Rosenfeld, Michael G.	Professor	Medicine	SchMed
Ross, Lola R.	Professor	Fam/Prev Medicine	SchMed/Muir
Rotenberg, Manuel	Professor Emeritus	ECE	Muir
Rothenberg, Jerome D.	Professor	Visual Arts/Literature	Roosevelt
Rothschild, Linda P.	Professor	Mathematics	Warren
Roy, Kaustuv	Assistant Professor	Biology	Roosevelt
Rudee, M. Lea	Professor Emeritus	ECE	Warren
Rudnick, Daniel L.	Assistant Professor	SIO	SIO
Rudwick, Martin J.S.	Professor	History	Warren
Ruiz, Ramon E.	Professor Emeritus	History	Muir
Rumsey, Victor H.	Professor Emeritus	ECE	Muir
Russell, Percy J.	Professor Emeritus	Biology	SchMed
Sah, Robert L.-Y.	Assistant Professor	Bioengineering	Muir
Saier, Milton H., Jr.	Professor	Biology	Muir
Sailor, Michael J.	Associate Professor	Chemistry and Biochemistry	Roosevelt
Saito, Leland	Assistant Professor	Ethnic Studies	Marshall
Saitoh, Tsunao	Professor	Neurosciences	SchMed
Salmon, David P.	Associate Professor-in-Residence	Neurosciences	SchMed
Salmon, Richard L.	Professor	SIO	SIO
Saltman, Paul D.	Professor	Biology	Revelle
Sanchez, Marta E.	Associate Professor	Literature	Marshall
Sanchez, Rosaura	Professor	Literature	Marshall
Sandwell, David T.	Professor	SIO	SIO
Sarkar, Sutanu	Associate Professor	AMES	Warren
Saville, Jonathan	Professor Emeritus	Theatre	Revelle
Savitch, Walter J.	Professor	CSE	Muir
Sawrey, Barbara	Lecturer (SOE)	Chemistry and Biochemistry	Revelle
Scanga, Italo	Professor	Visual Arts	Muir
Schaede, Ulrike	Assistant Professor	IRPS	IRPS
Schafer, William	Assistant Professor	Biology	Roosevelt
Schane, Sanford A.	Professor Emeritus	Linguistics	Roosevelt
Scheffler, Immo E.	Professor	Biology	Revelle
Schick, Steven E.	Professor	Music	Muir
Schiller, Daniel T.	Associate Professor	Communication	Muir
Schiller, Herbert I.	Professor Emeritus	Communication	Marshall
Schmid-Schoenbein, Geert W.	Professor	Bioengineering	SchMed
Schmidt, Robert J.	Associate Professor	Biology	Warren
Schneider, Alan M.	Professor Emeritus	AMES	Warren
Schneider, Jerry A.	Professor	Pediatrics	SchMed
Schrauzer, Gerhard N.	Professor	Chemistry and Biochemistry	Revelle

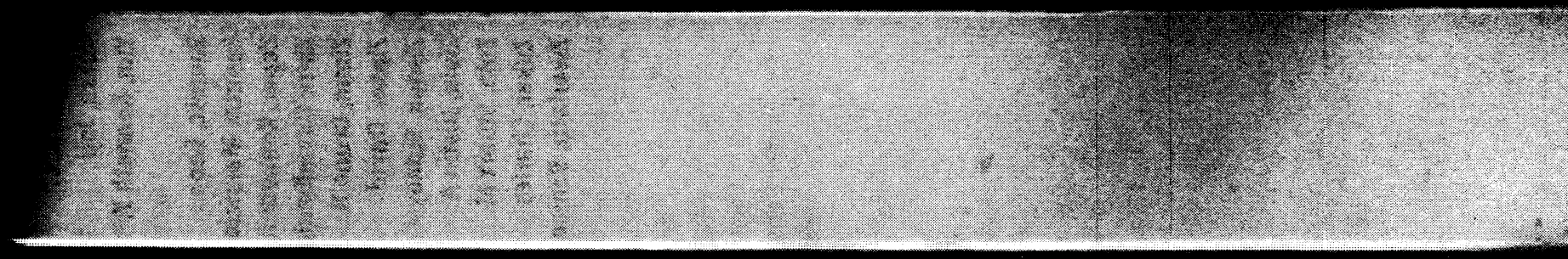
Schreibman, Laura E.	Professor	Psychology	Warren
Schroeder, Julian I.	Associate Professor	Biology	Warren
Schuckit, Marc A.	Professor	Psychiatry	SchMed
Schudson, Michael S.	Professor	Sociology/Communication	Marshall
Schuller, Ivan K.	Professor	Physics	Revelle
Schultz, Sheldon	Professor Emeritus	Physics	Marshall
Schwartz, Theodore	Professor	Anthropology	Muir
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	AMES	Marshall
Seiter, Ellen	Professor	Communication	Roosevelt
Sejnowski, Terrence J.	Professor	Biology	Muir
Selverston, Allen I.	Professor	Biology	Warren
Sereno, Martin I.	Associate Professor	Cognitive Science	Warren
Seshadri, Kalyanasundaram	Professor	AMES	Marshall
Shadwick, Robert E.	Associate Professor	SIO	SIO
Shafir, Gershon	Professor	Sociology	Roosevelt
Sham, Lu Jeu	Professor	Physics	Warren
Shank, Adele E.	Professor	Theatre	Marshall
Shank, Theodore J.	Professor Emeritus	Theatre	Revelle
Shapin, Steven	Professor	Sociology	Revelle
Shapiro, Vitali	Professor	ECE/Physics	Roosevelt
Sharma, Vivek	Assistant Professor	Physics	Muir
Sharpe, Michael J.	Professor	Mathematics	Muir
Shearer, Peter M.	Professor	SIO	SIO
Shenk, Norman A.	Lecturer (SOE)	Mathematics	Revelle
Sher, Gila	Associate Professor	Philosophy	Warren
Shevelow, Kathryn	Associate Professor	Literature	Muir
Shiffman, Gary A.	Assistant Professor	Political Science	Roosevelt
Shirk, Susan L.	Professor	Political Science/IRPS	Roosevelt/IRPS
Shor, George G., Jr.	Professor Emeritus	SIO	SIO
Shugart, Matthew F.	Associate Professor	IRPS	IRPS
Shuler, Kurt E.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Shults, Clifford W.	Associate Professor	Neurosciences	SchMed
Siegel, Jay S.	Associate Professor	Chemistry and Biochemistry	Muir
Siegel, Paul	Professor	ECE	Roosevelt
Silber, John J.	Professor Emeritus	Music	Roosevelt
Silva, Ernest R.	Associate Professor	Visual Arts	Warren
Simon, John D.	Professor	Chemistry and Biochemistry	Revelle
Singer, S. Jonathan	University Professor Emeritus	Biology	Revelle/SchMed
Sinha, Amitabha	Assistant Professor	Chemistry and Biochemistry	Warren
Skalak, Richard	Professor-in-Residence	Bioengineering	SchMed
Small, Lance W.	Professor	Mathematics	Revelle
Smallwood, Dennis E.	Professor Emeritus	Economics	Warren
Smith, Donald R.	Professor	Mathematics	Revelle
Smith, Douglas W.	Professor	Biology	Muir
Smith, Harding E.	Professor	Physics	Revelle
Smith, Peter H.	Professor	Political Science	Marshall
Smith, Susan L.	Associate Professor	Visual Arts	Muir
Sobel, Joel	Professor	Economics	Revelle
Solis, Faustina	Professor Emeritus	Fam/Prev Medicine	Marshall

Sollberger, Harvey	Professor	Music	Muir
Somero, George N.	Professor Emeritus	SIO	SIO
Somerville, Richard C. J.	Professor	SIO	SIO
Sorensen, Harold W.	Professor Emeritus	AMES	Revelle
Souviney, Randall J.	Senior Lecturer (SOE)	TEP	Marshall
Spector, Deborah H.	Professor	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	Biology	Muir
Spooner, Charles E.	Professor Emeritus	Neurosciences	SchMed
Squire, Larry R.	Professor-in-Residence	Psychiatry/Neurosciences	SchMed
Stanton-Salazar, Ricardo D.	Assistant Professor	Sociology	Muir
Stark, Harold M.	Professor	Mathematics	Muir
Starr, Ross M.	Professor	Economics	Warren
Steiger, Rand	Professor	Music	Warren
Steinberg, Daniel	Professor	Medicine	SchMed
Steinmetz, Phel	Associate Professor	Visual Arts	Revelle
Stern, Herbert	Professor Emeritus	Biology	Marshall
Stevens, Jane	Assistant Professor	Music	Revelle
Stewart, John L.	Professor Emeritus	Literature	Muir
Stiles, Joan	Professor	Psychology	Muir
St. John, Mark F.	Assistant Professor	Cognitive Science	Marshall
Storms, Lowell H.	Professor-in-Residence	Psychiatry	SchMed
Streeby, Shelley	Assistant 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	Biology	Warren
Sugihara, George	Associate Professor	SIO	SIO
Suhl, Harry	Professor Emeritus	Physics	Revelle
Sung, Lanping Amy	Associate Professor-in-Residence	Bioengineering	Warren
Surko, Clifford M.	Professor	Physics	Marshall
Swanson, Robert A.	Professor Emeritus	Physics	Revelle
Swartz, Marc J.	Professor	Anthropology	Muir
Swerdlow, Neal R.	Associate Professor	Psychiatry	SchMed
Swinney, David A.	Professor	Psychology	Roosevelt
Sworder, David D.	Professor/Associate Dean	ECE/Graduate Studies & Research	Revelle
Takash, Paule Cruz	Assistant Professor	Ethnic Studies	Marshall
Talbot, Jan B.	Associate Professor	AMES	Muir
Talke, Frank E.	Professor	AMES	Warren
Talley, Lynne D.	Professor	SIO	SIO
Tanaka, Stefan	Associate Professor	History	Roosevelt
Tauxe, Lisa	Professor	SIO	SIO
Tay, William Shu-sam	Professor	Literature	Roosevelt
Taylor, Palmer W.	Professor	Pharmacology	SchMed
Taylor, Susan S.	Professor	Chemistry and Biochemistry	SchMed/Roosevelt
Teilhet-Fisk, Jehanne H.	Professor Emeritus	Visual Arts	Roosevelt
Terras, Audrey A.	Professor	Mathematics	Revelle
Terry, Robert D.	Professor Emeritus	Neurosciences/Pathology	SchMed
Thal, Leon J.	Professor	Neurosciences	SchMed

Theodorakis, Emmanouil	Assistant Professor	Chemistry and Biochemistry	Muir
Thiemens, Mark H.	Professor	Chemistry and Biochemistry	Marshall
Thiess, Frank B.	Sr. Lecturer (SOE) Emeritus	Mathematics	Marshall
Ticho, Harold K.	Professor Emeritus	Physics	Marshall
Timmerman, Allan	Assistant Professor	Economics	Muir
Tohsaku, Yasu-Hiko	Associate Professor	IRPS	IRPS/Roosevelt
Tokuyasu, Kiyoteru	Professor-in-Res Emeritus	Biology	Revelle
Tomlinson, Barbara	Associate Professor	Literature	Muir
Tonkovich, Nicole	Assistant Professor	Literature	Roosevelt
Tor, Yitzhak	Assistant Professor	Chemistry and Biochemistry	Marshall
Trauner, Doris A.	Professor	Neurosciences/Pediatrics	SchMed
Trivedi, Manmohan	Professor	ECE	Warren
Trogler, William C.	Professor	Chemistry and Biochemistry	Revelle
Troupe, Quincy	Professor	Literature	Marshall
Truant, Cynthia M.	Associate Professor	History	Roosevelt
Tschirgi, Robert D.	Professor Emeritus	Neurosciences	SchMed/Muir
Tsien, Roger K.	Professor	Pharmacology/Chem. and Biochemistry	SchMed/Revelle
Tu, Charles W.	Professor	ECE	Marshall
Tukey, Robert H.	Professor-in-Residence	Medicine/Pharmacology	SchMed
Turetzky, Bertram J.	Professor	Music	Muir
Turner, Christena	Associate Professor	Sociology	Roosevelt
Tuzin, Donald F.	Professor	Anthropology	Revelle
Tytler, David R.	Professor	Physics	Muir
Uang, Chia-Ming	Associate Professor	AMES	Warren
Ung, Chinary	Professor	Music	Roosevelt
Vacquier, Victor	Professor Emeritus	SIO	SIO
Vacquier, Victor D.	Professor	SIO	SIO
VanAtta, Charles W.	Professor Emeritus	AMES/SIO	Revelle/SIO
Van Young, Eric	Professor	History	Roosevelt
Varki, Ajit P.	Professor	Medicine	SchMed
Varni, James W.	Professor-in-Residence	Psychiatry	SchMed
Varon, Silvio S.	Professor Emeritus	Biology	SchMed
Vasquez, Olga	Assistant Professor	Communication	Marshall
Vecchio, Kenneth S.	Associate Professor	AMES	Roosevelt
Vehrencamp, Sandra L.	Professor	Biology	Muir
Vendler, Zeno	Professor Emeritus	Philosophy	Muir
Verdicchio, Pasquale	Assistant Professor	Literature	Roosevelt
Vernon, Wayne	Professor Emeritus	Physics	Revelle
Vianu, Victor D.	Professor	CSE	Marshall
Viterbi, Andrew J.	Professor	ECE	Warren
Volcani, Benjamin E.	Professor Emeritus	SIO	SIO
Vold, Regitze R.	Professor	Chemistry and Biochemistry	Revelle
Wadsworth, Adrian R.	Professor	Mathematics	Warren
Wagner, Arthur	Professor Emeritus	Theatre	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
Walter, Barbara	Assistant Professor	IRPS	IRPS

Walter, Gernot F.	Professor	Pathology	SchMed
Walters, Les	Professor	Theatre	Revelle
Wang, Jean Yin Jen	Professor	Biology	SchMed/Roosevelt
Ward, John F.	Professor Emeritus	Radiology	SchMed
Wasserman, Stephen I.	Professor	Medicine	SchMed
Watson, Joel	Assistant 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.	Assistant Professor-in-Residence	Medicine	SchMed
Wei, Wuchang	Assistant Professor	SIO	SIO
Weinger, Matthew B.	Associate Professor	Anesthesiology	SchMed
Weiss, Ray F.	Professor	SIO	SIO
Welchman, John C.	Assistant Professor	Visual Arts	Muir
Wenkert, Ernest	Professor Emeritus	Chemistry and Biochemistry	Revelle
Wenzl, Hans	Professor	Mathematics	Marshall
Werner, Bradley T.	Associate 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
Whitehead, Mark C.	Associate Professor	Surgery	SchMed
Wieder, Harry H.	Professor-in-Residence Emeritus	ECE	Muir
Wiederholt, Wigbert C.	Professor	Neurosciences	SchMed
Wienhausen, Gabriele	Lecturer (SOE)	Biology	Marshall
Williams, Ben A.	Professor	Psychology	Muir
Williams, Forman A.	Professor	AMES	Marshall
Williams, Ruth J.	Professor	Mathematics	Warren
Williams, Sherley A.	Professor	Literature	Marshall
Williamson, S. Gill	Professor	CSE	Roosevelt
Wills, Christopher	Professor	Biology	Warren/SchMed
Wilson, Kent R.	Professor	Chemistry and Biochemistry	Revelle
Winant, Clinton D.	Professor	SIO	SIO
Winker, James R.	Associate Professor	Theatre	Marshall
Winterer, Edward L.	Professor	SIO	SIO
Wiseman, Jacqueline P.	Professor Emeritus	Sociology	Warren
Witzum, Joseph	Professor	Medicine	SchMed
Wixted, John T.	Associate Professor	Psychology	Revelle
Wolf, Jack K.	Professor	ECE	Roosevelt
Wolfe, Arthur M.	Professor	Physics	Warren
Woll, S. Heather	Assistant Professor	CSE	Roosevelt
Wong, David Y.	Professor Emeritus	Physics	Warren
Wong-Staal, Flossie	Professor	Biology/Medicine	Revelle/SchMed
Woodhull, Winifred	Associate Professor	Literature	Warren
Woodruff, Christopher M.	Assistant Professor	IRPS	IRPS
Woodruff, David S.	Professor	Biology	Roosevelt
Woods, Virgil L.	Associate Professor	Medicine	SchMed
Woolard, Kathryn A.	Associate Professor	Sociology	Muir

Wright, Andrew	Professor Emeritus	Literature	Revelle
Wulbert, Daniel E.	Professor	Mathematics	Marshall
Yaffe, Michael P.	Associate Professor	Biology	Marshall
Yaksh, Tony L.	Professor	Anesthesiology	SchMed
Yalowitz, Steven	Assistant Professor	Philosophy	Roosevelt
Yanofsky, Martin F.	Associate Professor	Biology	Warren
Yee, Bennet S.	Assistant Professor	CSE	Muir
Yen, Samuel S.C.	Professor	Reproductive Medicine	SchMed
Yguerabide, Juan	Professor	Biology	Marshall
Yip, Wai-Lim	Professor	Literature	Muir
Yoneyama, Lisa	Assistant Professor	Literature	Roosevelt
York, Herbert F.	Professor Emeritus	Physics	Warren
Young, William R.	Professor	SIO	SIO
Yu, Edward	Assistant Professor	ECE	Marshall
Yu, Paul K. L.	Professor	ECE	Revelle
Yuasa, Joji	Professor Emeritus	Music	Warren
Yun, Kenneth Y.	Assistant Professor	ECE	Revelle
Zamosc, Leon	Associate Professor	Sociology	Roosevelt
Zanetti, Maurizio	Professor-in-Residence	Medicine	SchMed
Zeger, Kenneth A.	Associate Professor	ECE	Roosevelt
Zhiri, Oumelbanine	Assistant Professor	Literature	Roosevelt
Zimm, Bruno H.	Professor Emeritus	Chemistry and Biochemistry	Revelle
Zipser, David	Professor	Cognitive Science	Roosevelt
Zisook, Sidney	Professor	Psychiatry	SchMed
Zivin, Justin A.	Professor	Neurosciences	SchMed
Zola, Stuart M.	Professor-in-Residence	Psychiatry/Neurosciences	SchMed
Zuker, Charles	Professor	Biology/Neurosciences	Revelle/SchMed
Zweifach, Benjamin W.	Professor Emeritus	Bioengineering	Warren/SchMed



Interviews

Interviews

THE DISTINGUISHED FACULTY, EXCELLENT ACADEMIC PROGRAMS, AND HIGH QUALITY OF THE STUDENT BODY, TOGETHER WITH THE SPLENDID PHYSICAL SETTING OF THE UCSD CAMPUS, OFFER AN INCOMPARABLE UNIVERSITY EXPERIENCE. THE FOLLOWING INTERVIEWS PROVIDE INTERESTING INSIGHTS BY FACULTY, STAFF, AND STUDENTS.

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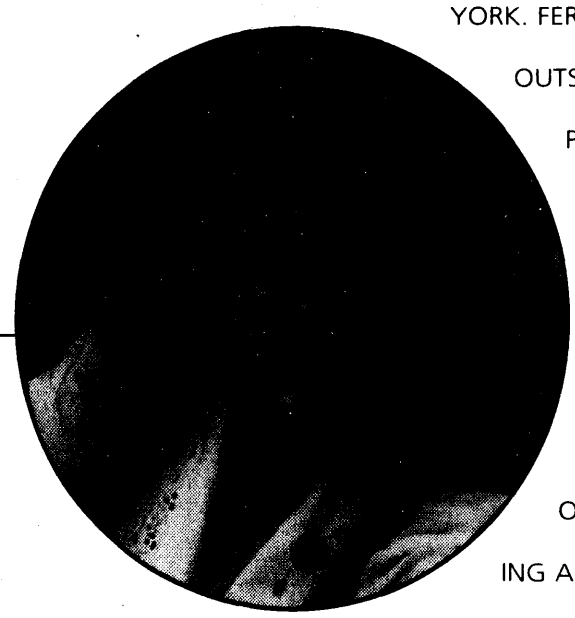
DEPARTMENT

OF COMPUTER

SCIENCE AND

ENGINEERING



JEANNE FERRANTE, PROFESSOR OF COMPUTER SCIENCE AND ENGINEERING, RECENTLY JOINED THE UCSD SCHOOL OF ENGINEERING AFTER SIXTEEN YEARS WITH IBM'S T.J. WATSON RESEARCH CENTER IN NEW YORK. FERRANTE RECEIVED HIGH RECOGNITION AT IBM, INCLUDING THE OUTSTANDING INNOVATION AWARD IN 1992 AND 1988 AND THE BEST PAPER AWARD IN 1989. PRIOR TO WORKING FOR IBM, SHE WAS AN ASSISTANT PROFESSOR OF MATHEMATICS AT TUFTS UNIVERSITY. FERRANTE EARNED A DOCTORATE IN MATHEMATICS FROM M.I.T. IN 1974. IN 1996, SHE WAS ELECTED A FELLOW OF THE ASSOCIATION FOR COMPUTING MACHINERY (ACM). THE ACM IS AN 85,000-MEMBER INTERNATIONAL SCIENTIFIC AND EDUCATIONAL ORGANIZATION. FERRANTE'S RESEARCH INTERESTS INCLUDE OPTIMIZING AND PARELLELIZING COMPILERS, OPTIMIZING DATA MOVEMENT IN MULTIPROCESSOR AND MEMORY HIERARCHY MACHINES, AND AUTOMATIC DETECTION AND EXPLOITATION OF PARALLELISM.

Q. What experiences influenced your career choices?

A. I think an overall theme to my career has been the influence of mentors, particularly women who have been supportive of my career.

I came from a working class background where few people around me even thought of going to college. But I had always been interested in science as a kid, and I thought I would be an elementary or high school teacher.

Later, I enrolled in an experimental undergraduate college within Hofstra

University. The college focused on a small faculty and student body and fostered a strong feeling of community. It was a very encouraging place for me and I learned to reach beyond my original expectations for myself. My mentors there got me interested in mathematics and encouraged me to go on to graduate school.

I went to M.I.T. to pursue a career in mathematical research. While there, I became interested in computer science and was guided by a dynamic adviser who generated a lot of excitement about the field.

After a brief period teaching at Tufts University, I decided instead to work in industry and joined IBM. I really switched from being a theory person to being a much more hands-on person. Again, I was influenced by a wonderful mentor, Fran Allen, who was the first female IBM fellow, and a pioneer in the field of compiling. I got back on track and became much more confident in my career choice.

Q. Why did you decide to join UCSD after sixteen years at IBM?

A. Part of the reason that I came to UCSD was that I felt it was time to give something back—to give support to young people, just as my mentors did throughout my career. It is satisfying to help people develop their skills and be the best they can be.

I also wanted to move away from short-term product development and concentrate more on research.

Q. What trends do you see for women in engineering?

A. The number of women in engineering was continuously increasing up until the early 1990s. Then the numbers dropped off for a while as the job market got tougher. Now, it seems that there is a higher proportion of women entering the field again.

I think we need to do as much as we can to encourage women and keep them in the field. We also need to reach out to girls in elementary and high school so that they will consider the sciences as a major in college.

Q. What advice would you give to undergraduate students who are trying to define their career paths?

A. Search around for a focus you like and let yourself become involved in it. Try taking a summer job in industry or working on a research project with a faculty member. I have an undergraduate student who has joined our research project. She got the position because she came to me and expressed an interest in research, so we made a place for her. Now she is taking an increasing role in our project.

Q. What is your area of research?

A. I work on translating high-level programming languages like C++ into the more detailed and less abstract languages understood by machines. This field is called compiling and it really affects every level of computing. I am particularly involved in helping the machines translate software written in high-level language as quickly and using as little memory as possible. Most of my work has been in translating complicated software programs that have been written by scientists for scientific models or research projects.

I am also involved in parallel machines that may have multiple CPUs which have to work in sync. Today, these machines are being linked together across the information superhighway. The challenge is efficiently to take advantage of all of that computer power. You have to get the right data to the right processor at the right time—which is all the job of the compiler.

Q. How are advances in computer science influencing the curriculum?

A. Computer science is changing incredibly fast and the university is moving with those changes. The global interconnection is revolu-

tionizing how
advances in hardw
changing the way we

We continue to teac
with an updated approach.
have gone from teaching begin
ming in C to teaching C++. Stude
more excited about programming in
guage and it seems to be a real entree
ting jobs.

I think it is important for students to understand early on that technology changes rapidly and that the particular language or hardware they learn in school may be completely different five years after they graduate. I would encourage students to pay attention to the general concepts they are learning and to develop rational thinking about how to solve problems.

An overall theme to my career has been the influence of mentors, particularly women who have been supportive of my career.

Q. How does your work in industry affect your experiences at the university?

A. While I am working on fundamental research, I keep in mind that the ultimate goal is to apply the findings to a product that can benefit society. That hands-on application side is always in my mind.

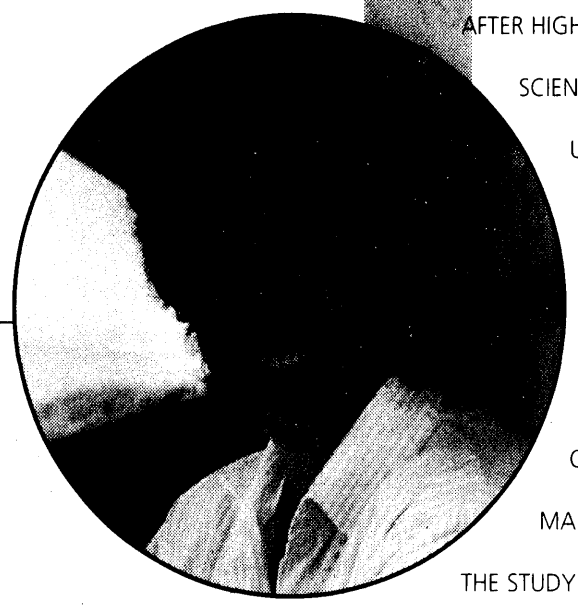
In the classroom, I try to keep students aware of the difference between course work and the real world. For example, we may be building a compiler that works very well in theory. However, we are not taking into consideration problems such as error recovery or sturdiness. These are all things students will deal with in the workplace.

Q. What are your interests outside of work?

A. At a certain point in my life, I decided
needed more balance in life, and I'm
pursue interests unrelated to work
ing and biking, and even got in
kayaking this summer. I also
three years ago while o
husband in Boulder

Margo Haygood

SCRIPPS INSTITUTION *of* OCEANOGRAPHY



ARGO HAYGOOD HAS PARENTS WHO ARE ACADEMICIANS AND WHO, FROM THE BEGINNING, WERE SUPPORTIVE OF HER PARTICULAR METHOD OF INTELLECTUAL PURSUIT. FOR HAYGOOD, THAT MEANT TAKING SOME TIME OFF FROM HIGH SCHOOL FOR PERSONAL EXPLORATION, WHILE LIVING IN CLEVELAND.

AFTER HIGH SCHOOL, HAYGOOD RECEIVED HER BACHELOR OF ARTS DEGREE IN HISTORY OF SCIENCE FROM HARVARD UNIVERSITY. SHE THEN APPLIED AND WAS ACCEPTED TO UCSD'S SCRIPPS INSTITUTION OF OCEANOGRAPHY (SIO) FOR HER SIX-YEAR DOCTORAL PROGRAM. AGAIN, SHE TOOK A MID-WAY BREAK IN STUDIES, THIS TIME TO DO RESEARCH IN JAPAN ON BIOLUMINESCENT SYMBIONTS IN THE PINE CONE FISH. HAYGOOD'S POSTDOCTORAL STUDIES WERE IN MOLECULAR BIOLOGY AT THE UNIVERSITY OF WASHINGTON, SEATTLE, FOLLOWED BY A POSITION AT THE OFFICE OF NAVAL RESEARCH IN ARLINGTON, VIRGINIA, AS A PROGRAM MANAGER FOR MARINE BIOLOGY PROJECTS.

THE STUDY OF BIOLUMINESCENT SYMBIONTS IS AN IMPORTANT AREA OF STUDY FOR HAYGOOD. ONE OF HER PET PROJECTS IS THE STUDY OF A MARINE INVERTEBRATE THAT IS A SOURCE OF A CHEMICAL COMPOUND BEING USED IN CLINICAL RESEARCH TRIALS AS A POSSIBLE CANCER DRUG.

ACCORDING TO HAYGOOD, THERE IS PERSISTENT SPECULATION THAT IT IS ACTUALLY THE MICROBIAL SYMBIONTS ASSOCIATED WITH THE HOST ANIMAL THAT MANUFACTURE THE HIGHLY INTRIGUING CHEMICAL COMPOUND, AND NOT THE ANIMAL ITSELF. IF THAT WERE THE CASE, SHE SAYS, AND IF YOU COULD GROW THE BACTERIA IN A LABORATORY, IT COULD BE GROWN VERY CHEAPLY "INSTEAD OF HAVING TO SCRAPE THIS LITTLE THING OFF THE ROCKS AND USE THOUSANDS OF POUNDS OF THEM JUST TO EXTRACT TINY AMOUNTS OF THE DRUG." IN THIS PROJECT, HER RESEARCH HAS A VERY DIRECT APPLICATION TO CUTTING-EDGE MEDICAL RESEARCH.

Q. What kind of experience was it for you, working for the Office of Naval Research?

A. It was a program dealing with science grants to people in universities; it wasn't with their internal research. It was a very educational experience, learning how the funding of science works in Washington. The job involved interacting with not only one's own agency, but with people in other agencies, to find how initiatives develop in new areas and how they are nurtured—and die—which they eventually do.

Q. Is there much politicizing in grant funding?

A. Certainly, but not directly. There is a strong influence with what is happening politically. The people who run the research programs are scientists first and foremost, but they are under pressure from other sources. So, it was a very valuable learning experience, and I happened to be there at a time when there was a very dynamic group of people there. It was really a great group to work with. At that time, in 1985–86, there was money available to initiate and nurture programs. But, I don't think it would be as much fun now.

Q. For students who might be interested in following a biology or science field that requires laboratory work, what would you suggest to them?

A. The number one priority is to get research experience, independent research experience. I don't mean just taking a lab course. There are a lot of really excellent summer courses that are a good way to explore a field. But it's not the same as going into a laboratory and being responsible for a project of your own, and having to face all the disappointments, frustrations, and organizational challenges of making research work. The specific topic is less important—it doesn't have to be that close to what you end up doing. What's important is that you do it and that you spend enough time at it to really get a sense of what's involved, because the skills and the personality for someone who does research, and I mean for someone who is going to get a doctorate, require a tremendous amount of commitment and patience.

Brains are not enough. They are necessary, but not sufficient. The people who excel in science aren't necessarily the ones who were the straight-A students in college. In fact, the straight-A students who think the natural thing to do is to go to graduate school, but who haven't had any research experience, sometimes get a very rude awakening in that first year or two when they discover they can't stand doing research and that they have no gift for it.

Q. Why might those students who haven't had lab experience find it so difficult?

A. Lab work requires a different set of skills. Being able to absorb information—which is what you do when you are a good student—is very useful, because you then bring that information into your research. But it has nothing to do with the skills of doing research itself. And so, I'm always very concerned when I see a graduate school application from someone who has a lot of talent but who has never had research experience. I ask that person, "How can you commit yourself to five or [illegible] with the idea that [illegible] for the rest of your life [illegible] spent at least several mon[illegible] while you were an undergrad[illegible]

Q. Where would those kinds o[illegible] research opportunities exist for [illegible] graduates?

A. They exist right here on campus. There are several good programs at UCSD that help funnel students into the laboratories. I always have one or two undergraduate students doing research projects in my lab. There are summer programs, both on UCSD's central campus and at Scripps Institution of Oceanography. It's easier now than when I was a student. When I was a student, you went around banging on doors and volunteering, and eventually someone would let you in. Now they actually place students into programs and pay them. It's not a lot of money, but it's far easier now.

Q. When did you start doing research?

A. I started when I was a freshman. I continued, off and on, during the summer and during the school year, pretty much all through college. I felt that was the best possible preparation. I'm sure I was worse than useless in many cases, but people were generous with me. So, I try to give a chance to any people who have any reasonable shot at it.

How can you commit yourself to five or six years of intensive research...without having spent at least several months doing this while you were an undergraduate student?

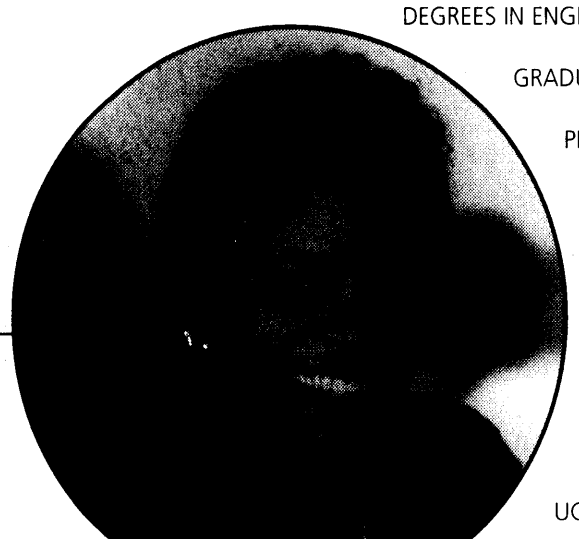
es Davis

ENGINEERING

STUDENT SERVICES

SCHOOL OF

ENGINEERING



LYNDA JONES DAVIS, DIRECTOR OF ENGINEERING STUDENT SERVICES FOR THE SCHOOL OF ENGINEERING, EARNED BACHELOR'S AND MASTER'S DEGREES IN ENGINEERING FROM PURDUE UNIVERSITY, GRADUATING IN 1986. DURING HER UNDERGRADUATE TRAINING, DAVIS SERVED AS AN ASSISTANT IN THE MINORITY ENGINEERING PROGRAM AT PURDUE. LATER, AS A GRADUATE STUDENT, SHE WAS ACTIVE IN OUTREACH TO PROSPECTIVE STUDENTS. SHE WENT ON TO BECOME THE ACADEMIC ADVISER FOR THE DEPARTMENT OF FRESHMAN ENGINEERING AT PURDUE.

IN 1991, DAVIS JOINED THE UCSD SCHOOL OF ENGINEERING TO CONTINUE THE MESA (MATHEMATICS, ENGINEERING, SCIENCE, ACHIEVEMENT) ENGINEERING PROGRAM FOR UNDERREPRESENTED MINORITIES. SINCE ARRIVING AT UCSD, SHE HAS BEEN INSTRUMENTAL IN SECURING SEVERAL GRANTS TO EXPAND THE MESA ENGINEERING PROGRAM, INCLUDING AN NSF-SPONSORED ACTIVITY TO ADDRESS ISSUES OF TRANSITION THAT AFFECT SOPHOMORE ENGINEERING STUDENTS.

Q. How did the Engineering Student Services office get started?

A. It is really an offshoot of the MESA program. MESA has successfully established a supportive community for minority students who have had to leave their own community to come to UCSD. MESA helps students form study groups, sponsors field trips, supports an industry–student mentor program, and serves as a resource to answer questions. We provide students information outside the curriculum—career directions, job opportunities, what it is like to be an engineer. This kind of information and support helps motivate students. It can make the difference between

whether a student stays in engineering or chooses a different major.

Now the Engineering Student Services office provides similar programs to all undergraduate engineering students. We are a resource and a central place where students can come to get answers.

Q. What are some of the programs that have been initiated recently?

A. While we have always helped students find working internships, in 1996 we launched a formal summer program. Companies commit to several well-defined, paid internships in specific areas. Students work for ten weeks at the corporate job site, and complete a report at the end of the experience. In some cases, students continue part-time into the fall. Junior and senior students can then choose to work in areas they are most interested in. We also have special internship opportunities available for women and underrepresented minorities as early as the freshman and sophomore year.

The Engineering Student Council has become quite active. The council organizes job fairs on campus, invites working engineers to give talks and seminars on campus, and disseminates information among the eleven student professional organizations on campus. We've dedicated space and money to the council, and even sent the officers to the National Engineering Student Council conference.

Another program that we are excited about is outreach to young students in elementary and junior high schools. Teams of three or four undergraduate students are matched with a teacher and class for a quarter. Each week, the team gives a hands-on demonstration or project that fits with the teacher's study plan. Our goal is to get children excited about engineering and science so they will take the classes they need in high school to prepare them for college. The engineering students love the experience because they learn about creativity and communication along the way.

Also, ta
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and presentations o
take advantage of field
and the "shadowing" pro
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ing their jobs. This will help you
sions on career directions and tru
commitment to the field. The engin
major is a professional major and stud
need to understand that from the begin
so that they have the heart to succeed.

Finally, learn the beauty of working in teams. Start study groups from day one. Or become involved in one of the student organizations. You'll develop the interpersonal skills so strongly desired by employers today.

Our goal is to get children excited about engineering and science so they will take the classes they need in high school to prepare them for college.

Q. Why did you become involved in undergraduate education?

A. When I finished my master's degree, I had to make a conscious decision: should I go to work in industry or serve in education? Throughout my time in college, I was influenced by stellar people who encouraged me to do what I wanted to do. As I was going through, it occurred to me that many people can make or break a student along the way. How well a student does often depends on the support of people who believe in him or her. I also loved my experiences as a student assistant for Purdue's Freshman Engineering Program. I became captivated by the process and decided to dedicate my career to helping engineering students succeed. My greatest joy is when I can be there at that critical moment when a student needs an encouraging word or just someone to talk with to get him or her through a hard place.

Q. What advice would you give students entering the engineering major?

A. As a freshman, do your best academically in the first few quarters. Many future decisions are based on your academic performance early on.

Q. What is the outlook for students graduating with an engineering degree?

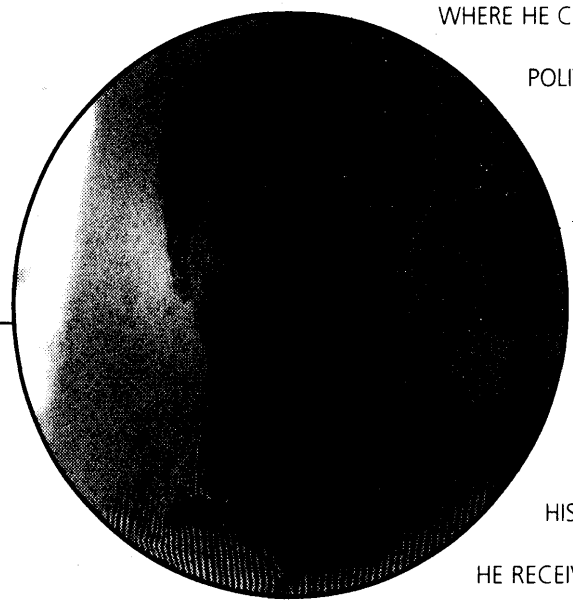
A. While technology and business constantly change, society will always put a premium on people who can think and solve problems. Right now, our students are getting job offers and companies are spending a lot of time recruiting on campus. There is a need for engineers today.

Neuhouser

DEPARTMENT

of

PHILOSOPHY



RED NEUHOUSER, PROFESSOR OF EUROPEAN PHILOSOPHY, JOINED THE UCSD FACULTY DURING THE SPRING OF 1996 AFTER SERVING AS THE JOHN L. LOEB ASSOCIATE PROFESSOR OF HUMANITIES IN THE PHILOSOPHY DEPARTMENT AT HARVARD UNIVERSITY. WHILE AT HARVARD, HE WAS AWARDED A TWO-YEAR FELLOWSHIP TO LIVE AND STUDY IN GERMANY, WHERE HE CONDUCTED RESEARCH ON HIS UPCOMING BOOK, A STUDY OF THE SOCIAL AND POLITICAL THEORIES OF HEGEL AND ROUSSEAU.

BORN AND RAISED ON A SMALL FARM IN INDIANA, NEUHOUSER LEFT HOME AT EIGHTEEN TO ATTEND WABASH COLLEGE, AN ALL-MALE LIBERAL ARTS UNDERGRADUATE COLLEGE. THOUGH A PRE-MED STUDENT, HE WAS EXPOSED TO THE TEACHINGS OF SOME OF THE GREAT EUROPEAN PHILOSOPHERS, SUCH AS PLATO, MARX, HEGEL, KIERKEGAARD, AND NIETZSCHE. BY THE TIME HE GRADUATED WABASH, NEUHOUSER KNEW HE WANTED TO SPEND HIS LIFE TEACHING PHILOSOPHY.

HE RECEIVED HIS MASTER'S DEGREE IN PHILOSOPHY FROM COLUMBIA UNIVERSITY IN 1980 AND A DOCTORATE IN PHILOSOPHY FROM THE SAME SCHOOL IN 1988. ASIDE FROM WRITING NUMEROUS ARTICLES, NEUHOUSER HAS PUBLISHED A BOOK CALLED *FICHTE'S THEORY OF SUBJECTIVITY.*

Q. You started in pre-med as an undergraduate. What made you change your mind?

A. I finished the whole pre-med program and I just decided I was a lot more excited about philosophy and about teaching than being a doctor. I didn't know before I went to college that I'd like philosophy. I'd never had philosophy; I didn't know what it was. But when I was an undergraduate I discovered what I wanted to do. I just took a philosophy course by accident. We had

distribution requirements and this was a course I chose to take. I don't know why I chose philosophy over some other course. Maybe there was a reason for that. But once I got started I just really liked it and I kept taking more until I decided that's what I wanted to major in. Finally, I decided that's what I wanted to teach and do for the rest of my life. Why? I don't know why. I still don't know why.

Q. What is your area of specialty?

A. European philosophy of the nineteenth and twentieth centuries, especially the nineteenth century. The people I'm most interested in are Hegel, Marx, Nietzsche, and Kierkegaard. I'm also interested in Rousseau. I'm interested in some twentieth-century thinkers like Heidegger and the existentialists. In philosophy, I suppose the things that I'm most interested in are social and political philosophy. So you can see my interest in Marx, for example.

Q. Why did you choose to join UCSD?

A. UCSD has a very strong department in philosophy and it's getting stronger all the time. Also, San Diego is unique in that it has been traditionally strong in the area I'm most interested in. For example, Herbert Marcuse, a guiding figure of the student movement of the 1960s, was here for a long time. So there's a kind of tradition here of doing social and political philosophy that's left wing, and rooted in the history of nineteenth- and twentieth-century European philosophy.

Q. How long did you teach at Harvard?

A. I taught there for eight years and I taught half-time at Columbia for four years. But I was still a graduate student for some of those years.

Q. How would you convince an undecided student to consider philosophy as an area of study?

A. I probably wouldn't.

Q. Why not?

A. I don't like having students in my class who don't want to be there. If I've thought somebody was interested in philosophy, and might benefit from it, the one thing I have done is to give them a book, a philosophy book, and tell them to read it. If they respond to it, and are excited about it, then they will be motivated to read more. If it leaves them cold, I don't feel any need to make them interested in it. People get interested in this stuff at different times in their lives, in different ways. The only thing to do to get people to study philosophy is to expose them to it.

Q. What got you really excited about philosophy?

A. I suppose it's because philosophy addresses what I think of as the most basic, most important questions about human existence. When I was a[n] the sorts of course[s] ing. Like, what free wi[ll] be free. I was originally in[terested] tions like, is there a God? Ho[w] there is? Or not know there is? [Do] know that we know anything? The[se] very, very general, very, very fundame[ntal] questions. Also, I've always been really i[n]ested in politics. I'm interested in political philosophy and what the right kind of state and government is.

Q. Are there other areas of study that interest you?

A. I'm interested in psychoanalysis and in Freud. These are not really professional interests, although Freud is to some extent. I teach Freud in some classes. I'm also really interested in film. But that's not from a philosophical point of view, or an academic viewpoint. I just like to go to the movies and read about them. I also love traveling. I like traveling even more than philosophy.

The things that I'm most interested in are social and political philosophy. UCSD has a very strong department in philosophy and it's getting stronger all the time.

gold

DEPARTMENT

of

VISUAL

ARTS

FAITH RINGGOLD, PROFESSOR OF VISUAL ARTS, IS A MASTER STORYTELLER, USING VARIOUS ART MEDIUMS AND THE PRINTED PAGE TO GIVE LIFE TO HER STORIES. MUCH OF RINGGOLD'S STORY MATERIAL IS AUTOBIOGRAPHICAL, WOVEN WITH THREADS OF AN AFRICAN AMERICAN HERITAGE AND SEWN TOGETHER, LIKE HER STORY QUILTS, WITH EXPERIENCES FROM LIFE.

RAISED IN HARLEM, NEW YORK, AND INFLUENCED BY HER STYLISH AND IMAGINATIVE MOTHER, FASHION DESIGNER WILLI POSEY—WHO ENCOURAGED HER DAUGHTER TO "FLY"—RINGGOLD RECEIVED HER BACHELOR'S AND MASTER'S DEGREES IN EDUCATION AND ART FROM CITY COLLEGE OF NEW YORK. SHE TAUGHT IN NEW YORK CITY'S SCHOOL SYSTEM BEFORE FINDING HER NICHE IN THE ART WORLD.

RINGGOLD'S EXHIBITION HISTORY BEGAN IN 1967 AT THE SPECTRUM GALLERY IN NEW YORK CITY, AND NOW INCLUDES INTERNATIONAL VENUES. SHE BEGAN TEACHING AT UCSD IN 1984 AS A FULL PROFESSOR.

WHILE CREATING HER STORY QUILTS, SHE STARTED WRITING DOWN STORIES ABOUT HER CHILDHOOD IN HARLEM. HER FIRST BOOK, CALDECOTT HONOR MEDAL WINNER *TAR BEACH*, WAS WRITTEN FOR HER STORY QUILT OF THE SAME NAME (WHICH IS OWNED BY THE GUGGENHEIM MUSEUM IN NEW YORK). *TAR BEACH* RECREATES A MEMORY OF HER CHILDHOOD, OF LYING ON THE HARLEM ROOFTOP ON HOT, SUMMER NIGHTS, WATCHING THE LIGHTS OF THE GEORGE WASHINGTON BRIDGE AND "FLYING AMONG THE STARS." OTHER BOOKS FOLLOWED, INCLUDING HER RECENT MEMOIR, *WE FLEW OVER THE BRIDGE, THE MEMOIRS OF FAITH RINGGOLD.* THE ARTIST DIVIDES HER TIME BETWEEN LA JOLLA, CALIFORNIA, AND ENGLEWOOD, NEW JERSEY.

Q. What do students heading for the university these days need to think about?

A. We are at the end of a millennium and, historically, a lot of significant events have occurred during this time. I think that young people need to look at our political, social,

and cultural history to see where changes need to be made. The beginning of a century is usually a time when exciting things happen. The end (of the century) is the time when all the pieces are supposed to be falling into place. The young are the ones who are going to cause these pieces to fall into place. They are the ones who are going to inherit this new century.

Q. Do you think young people are prepared to inherit the mantle of leadership in this society?

A. Young people are a part of the equation, of the concepts posed by science, sociology, the study of the mind and the body, the study of the environment and what we will need to be better people, to have a better world. One would hope that these future leaders will be able to take these concepts and make this a better place to live, and to make our life experience better for all of us.

Q. What would you say to students who are on a strict schedule and sometimes find themselves creatively depleted? What would you suggest for young people to do when things get rough for them?

A. I think they should take time out to reflect on what gives them strength and what they believe in. Apart from the books and learning, they need to think about things of a deeper spiritual meaning, such as the cultural connections that bring them closer to their origins and who they are. In times when I have been isolated from my family and under a great deal of pressure to create, but find that I feel depleted, depressed, and unable to function, I have drawn on memories of my childhood.

My mother made us go to church—something in my adult life that I have strayed away from. But, I don't knock it. It takes me back to a time when I felt safe and secure and good. I felt good about myself and knew that the next day was going to be exactly like this one. That is the wonderful security of being a child. That's when your childhood is really good. Nothing happens!

Also, when you get into trouble, you need help. And who helps you? Other people! So, you need to be able to reach out and help somebody, and to know when to reach out and ask for help from somebody. The university has resources for doing that.

Q. What advice would you give students if they were contemplating a career in the visual arts, but their parents might not think it appropriate for a life's work?

A. I have had many students who have done it—made the commitment. That is the day they come in and tell me, 'I told my parents.' Somebody else might say, 'What is that they told their parents? It must be an awful thing.' But it's never that. It's, 'Now I'm an art major! I have changed my concentration from computer science...' (or engineering, or whatever). 'I'm going to major in art. I can't do anything else. I've told my parents.' And then I would ask them how their parents felt and they would say, 'Oh, they are very upset.'

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have been extrem
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and have become suppo
dents have continued their
other disciplines and, once the
degrees, they tell their parents, 'H
degree,' and then create art instead.

But some of these people become
angry and bitter in later years because th
spent precious time studying something they had no interest in. Then, when they are older, they don't have the funds or the energy to follow through in art studies. This can be a bitter experience for a family.

My family once told me: 'Do you think we are going to send you to college to major in art? We know you like art, and we like it too, but you don't have to major in it!' In college I studied art and education. After college I taught art in New York schools and that experience was very meaningful. Teaching art was a practical consideration for me, but I learned from it. I have been teaching for forty-one years. It's a way of sharing that can't be done in any other way and I love it.

The young are the ones who are going to cause these pieces to fall into place. They are the ones who are going to inherit this new century.

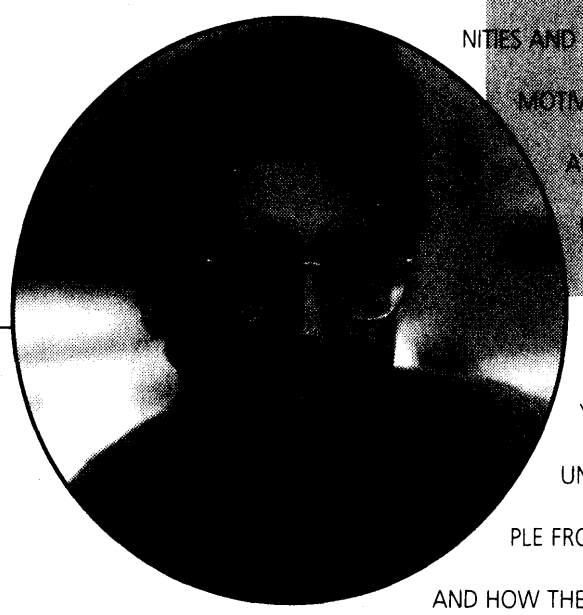
R*on-Salazar*

PROFESSOR,

DEPARTMENT

of

SOCIOLOGY



RICARDO STANTON-SALAZAR, ASSISTANT PROFESSOR OF SOCIOLOGY AT UCSD, IS A SAN DIEGO RESIDENT OF MEXICAN-IRISH DESCENT. HE GREW UP IN THE SOUTHEAST SECTION OF THE CITY, IN WHAT HE DESCRIBES AS A MULTIETHNIC NEIGHBORHOOD. HIS EXPERIENCES OF CRISS-CROSSING CULTURAL SPACES IN THIS COMMUNITY AND OVER THE BORDER TO VISIT RELATIVES IN TIJUANA AND MEXICALI MADE HIM COGNIZANT OF THE DIFFERENCES IN THE CULTURES OF THE NEIGHBORING COMMUNITIES AND COUNTRIES. HIS PARENTS, WHO WERE WORKING CLASS AND SELF-EDUCATED, MOTIVATED HIM TO WORK HARD IN SCHOOL. IN THE 1970S, STANTON-SALAZAR ATTENDED SAN DIEGO HIGH SCHOOL. HE THEN ATTENDED SAN DIEGO CITY COLLEGE. IT WAS ONLY BY CHANCE THAT STANTON-SALAZAR REALIZED THAT THERE MIGHT BE A POSSIBILITY FOR AN EDUCATION THAT MATCHED HIS DREAMS. TODAY, STANTON-SALAZAR SPECIALIZES IN THE STUDY OF ETHNIC MINORITY YOUTH AND FAMILIES SITUATED WITHIN URBAN COMMUNITIES THROUGHOUT THE UNITED STATES. IN HIS RESEARCH, HE ASCERTAINS BY WHICH METHODS YOUNG PEOPLE FROM DIFFERENT CLASS BACKGROUNDS LEARN ABOUT THEIR EDUCATIONAL OPTIONS, AND HOW THEY RESPOND TO OPPORTUNITIES AND BARRIERS. ACCORDING TO STANTON-SALAZAR, THE OPTIONS THAT EMERGED IN HIS LIFE WERE OFTEN UNEXPECTED.

Q. What kinds of information do you recommend young people seek out when they choose to attend college?

A. Seek guidance. Develop an early network that will give you not just moral support, but real information. When I was at San Diego City College, there were no programs similar to the ones we have today. There were no guaranteed transfer programs. You transferred on your own if you knew how to figure it out. Most of my friends didn't know how to figure it out. A friend whom I knew from church was a student at UCSD while I was at City College. He knew I wanted to continue my education and took it

upon himself to help me. I met some of his friends, other people of Mexican descent, from all over the state and the southwest. It was through those associations that I was introduced to the proper channels. One of those channels was Bill Stiles in UCSD's Early Outreach Program.

Q. So you would recommend that students who are uncertain about going on to college should seek solid academic guidance to help them make good choices?

A. It plays a significant role in distinguishing people who prosper within our school system from those who find it extraordinarily difficult to continue. When I began to study sociology, I made natural connections between my own experience and that of many of my peers in my neighborhood. Those people were bright enough, but they weren't embedded in the right kinds of networks that provided the guidance, the so-called human bridges, into different institutions. If I hadn't had that one friend, I don't know what would have happened—he made all the difference in the world.

Q. Do you think there is a better institutional support system in place now?

A. Yes. There is more support for students who are at the community colleges, including Early Outreach, guaranteed transfer, and other mechanisms. Also, it's not just about receiving guidance from people behind the desk. It is about having enough knowledge to be able to determine what is good information, and whether it's appropriate and timely. You need the kind of person who can assist you in evaluating that information. Sometimes well-meaning people attempt to make key career decisions for us, and that may not be what is best.

Q. Did that happen to you?

A. Well, my experience was more that of benign neglect. My parents, like so many other Mexican parents, encouraged me, stood behind me, and said they would support me in whatever I wanted to do. They tried to tap into my larger family network, to people who they felt had some knowledge. There's a concept and a term in Spanish called 'confianza.' You tap into people you have confidence in. It's not simply a matter of 'I know somebody who could help my son,' but it's who is out there in the social network whom the family can trust to do the best for the child. The problem, of course, is that working-class kin networks are not brimming with college-experienced people.

Success is predicated upon a strong connection to supportive and information-rich networks. 'Making it on your own' is self-delusional.

Q. You graduated from UCSD in 1979 with a degree in sociology. Why did you decide to major in sociology?

A. I started as a psychology major. At first I wanted to be a counseling psychologist. I was well into my major when I realized that I wasn't really studying the issues that were important to me.

Now I have students coming to me who are psych majors, and so on, who want to change their areas of concentration. Some are looking for a major which speaks to their interest in social and cultural issues. They discover there are a number of disciplines that deal with these issues, such as sociology, anthropology, ethnic studies, and urban studies and planning.

Q. Did you go to graduate school right from UCSD?

A. No, not right away. In my senior year I worked with some other Latino students who were in the program. We were finishing our majors and took off for a quarter to do our teaching internships. We all were geared to becoming bilingual elementary school teachers. Various school districts were courting us, even before we had graduated. After I graduated from UCSD, I had a definite sense that I was prepared for my new career. Most of my colleagues received con-

tracts and beg
However, I decide
year. When I returned
at an elementary school
south of San Diego.

**Q. When did you decide you w
get a graduate degree?**

A. A very good friend of mine—a forme
classmate at UCSD—was teaching in San Ysidro. She made the bold leap to continue her studies at Harvard, and she encouraged me to consider graduate school. Her influence was an important factor in my decision process—another example of how good connections have been important in my life. We were both going to meet up at Stanford. I applied and was accepted for graduate studies, and remained for the doctoral program.

Q. When did you come to UCSD?

A. In 1990, I received a UC President's Fellowship and negotiated to have the first two years in San Diego as a fellowship position. Many colleagues of mine had been criss-crossing the country looking for employment, and I was fortunate to be offered a teaching position at UCSD. My vision upon arriving at UCSD was to be able to go back to southeast San Diego to incorporate the community and its culture as a part of my research—to begin to make sense of it in a sociologically meaningful way.

Q. What would be the most valuable bit of information you could offer high school students at this time?

A. Students should learn as much as possible
about our educational system and learn abo
how people like themselves have become
cessful within the schools in their com
Success is predicated upon a strong
tion to supportive and informati
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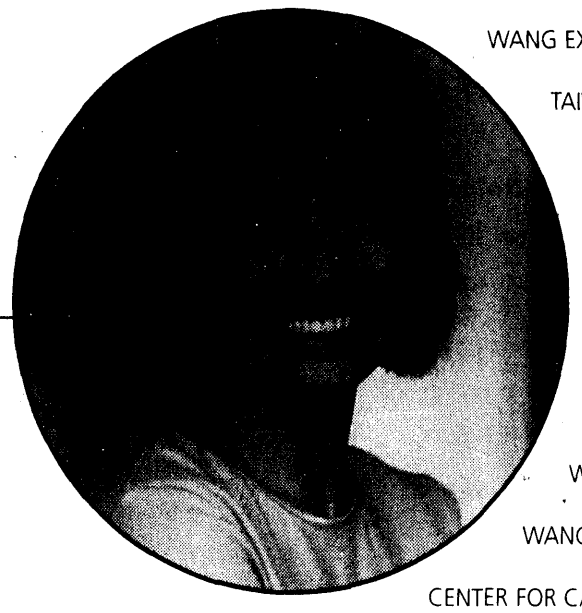
DEPARTMENT

of

BIOLOGY



EAN Y.J. WANG IS A PROFESSOR OF BIOLOGY AT UCSD WHO TEACHES MOLECULAR BIOLOGY TO SENIORS. MUCH OF WANG'S WORK HAS BEEN IN RESEARCHING THE ACTION OF CANCER-CAUSING GENES AND TUMOR GROWTH REGULATION.

GROWING UP IN TAIWAN, WHERE CONSIDERABLE EMPHASIS WAS PLACED ON EDUCATION, WANG EXCELLED IN HER STUDIES BOTH IN HIGH SCHOOL AND COLLEGE. SHE REMAINED IN TAIWAN TO FINISH HER COLLEGE STUDIES, REMAINING BEHIND AFTER HER FAMILY EMIGRATED TO SAN FRANCISCO. AFTER SHE GRADUATED WITH HIGH HONORS FROM NATIONAL TAIWAN UNIVERSITY WITH A BACHELOR OF SCIENCE DEGREE IN PLANT PHYSIOLOGY AND BIOCHEMISTRY, WANG JOINED HER FAMILY IN CALIFORNIA. SHE EVENTUALLY FOUND A POSITION IN A RESEARCH LABORATORY AT UC BERKELEY AND, WHILE ASSISTING IN THE LABORATORY, SHE WORKED FOR HER DOCTORATE, WHICH SHE EARNED FROM UC BERKELEY IN 1980.

WANG'S PRIOR RESEARCH EXPERIENCE INCLUDES A POSTDOCTORAL FELLOWSHIP AT THE CENTER FOR CANCER RESEARCH, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (M.I.T.), IN THE LABORATORY OF NOBEL LAUREATE AND CANCER RESEARCHER DAVID BALTIMORE, AND A LABORATORY POSITION IN THE DEPARTMENT OF BIOCHEMISTRY, UC BERKELEY.

HER WORK HAS EARNED HER A STRING OF HONORS, INCLUDING SEARLE SCHOLAR (1984); CHAIR, GORDON RESEARCH CONFERENCE ON CANCER (1995); AND THE BURROUGHS WELLCOME VISITING PROFESSORSHIP IN THE BASIC MEDICAL SCIENCES (1995–96). IN 1994, UCSD'S WARREN COLLEGE AWARDED WANG ITS ANNUAL OUTSTANDING TEACHER AWARD.

Q. What reasons did you have to pursue your education to the point that you have done?

A. I did very well in school, for one thing. It was very easy for me. I grew up in a Chinese society which values education, and I came from a family that had a tradi-

tion of education. My mother's parents both were educated at Oxford University, England. My grandfather was a lawyer and an economist who worked for the Chinese government. But he was jailed during the Sino-Japanese War during World War II, and the family was scattered. My mother escaped the war and fled to Taiwan. She was alone. She had lost her family and everything else. Then in Taiwan she met my father and, at an early age, she had me.

Q. What were your educational experiences while living in Taiwan?

A. I never had to worry about the heavy competition among students. In Taiwan, entrance exams are given every three years, and I always sailed through them. When I was in junior high, I had the top scores in the city. The newspapers came and interviewed me for that. I did well in all of my exams, all through school, which enabled me to attend the top girls' high school. Because of my scores I received a Chinese Ministry of Education Fellowship for National Taiwan University, which is considered to be the best university in Taiwan.

Q. When did you know that you wanted to be a biologist?

A. When I was thirteen, in Taiwan, I would take a magnifying glass and look at all the plants and molds. It's very humid there, so the climate supports many molds and plant growth. I could see all kinds of things under the magnifying lens. I was very curious about what I saw, and it remained very interesting to me. I just knew that that was what I wanted to study.

Q. After joining your family in the United States in 1974, what events led you to obtain a research position at UC Berkeley?

A. There were not too many research options in Taiwan, and I really wanted to be with my family in San Francisco. My mother was working in a hospital at the time. It was she who helped me to find work there as a medical technician. I liked the lab, and I wanted to try research. Then, I got lucky. A faculty member at UC Berkeley, who had been on sabbatical in Taiwan, hired me as a laboratory assistant. I loved the research and published two papers within eight months. I was accepted into the UC Berkeley Ph.D. program in biochemistry. At first, I found the work to be tough because I had to compete with some very good students.

Q. After you received your doctorate, what were your plans?

A. I was awarded a Jane Coffin Childs postdoctoral fellowship for biomedical research, and I was accepted into the research laboratory of Dr. Baltimore, where I worked for three years on cancer biology at the Center for Cancer Research. I heard very good things about UCSD and applied for a position. In 1983, I

professor. At that t

for newly appointed fa

through the Camille and

Foundation.

Q. If you could give one kerne

advice to students, what would

A. Follow your passion. Find out what it

that you want and stick to it. Don't let any-

one discourage you from reaching your goals.

Find good mentors. I didn't always do that and I tended to be independent. But looking back I think developing mentorships was something I could have worked harder at. Also, it's very important to ask your teachers questions. Don't struggle on your own.

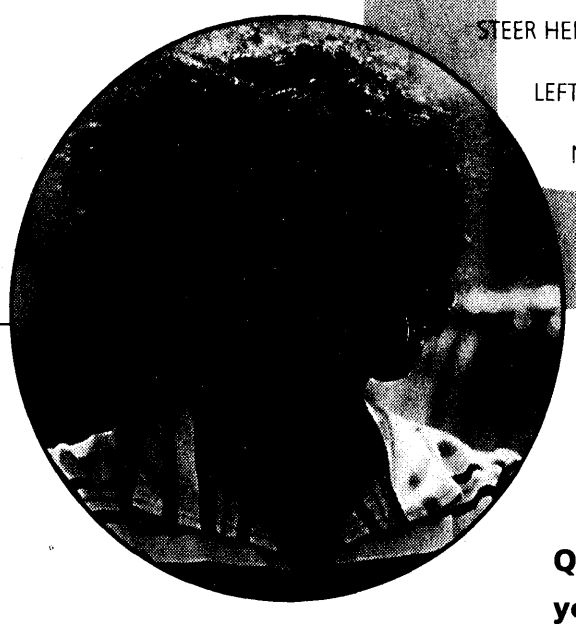
Follow your passion. Find out what it is that you want and stick to it. Don't let anyone discourage you from reaching your goals. Find good mentors.

Mata

WARREN

COLLEGE

FRESHMAN



ABRIELA MATA'S LOVE FOR HER DOG, LUCKY, HELPED STEER HER TOWARD PRE-VETERINARY COURSES AT UCSD. GABRIELA'S FAMILY LEFT PANAMA IN 1989 TO IMPROVE THE CHILDREN'S EDUCATIONAL OPPORTUNITIES. HOWEVER, WHEN HER MOTHER STAYED BEHIND TO SELL THEIR HOUSE, SHE AND LUCKY WERE DELAYED BY THE AMERICAN MILITARY OPERATION IN DECEMBER OF THAT YEAR. THE FAMILY FINALLY REUNITED AND SETTLED IN DOWNEY, CALIFORNIA. GABRIELA HAS A DOUBLE MAJOR IN ANIMAL PHYSIOLOGY AND SPANISH LITERATURE.

Q. Spanish is your first language. Has your acquisition of English gone smoothly?

A. Learning English has been my primary focus since moving to the United States. It was very challenging for me when I first arrived at UCSD. I had to pass the *Subject A* language proficiency and writing test. I took a class and was so stressed.

OASIS (Academic Support and Instructional Services) and my tutor Cecilia Ubilla, coordinator of its Language Program, helped me successfully pass the exam. My roommate has also been very supportive in correcting my grammar. I tend to get my Bs and Vs mixed up, so I'll say 'biew' when I mean 'view.' But, we decided that every Wednesday is 'Spanish Day,' so I get her back.

Q. You originally targeted marine biology as a major. Why did you change your mind?

A. I was interested in marine biology and also wanted to be close to Panama so I applied to the four best marine biology schools. I got accepted at the University of Miami, Florida Tech, UC Santa Barbara, and UCSD. I love animals and I'm also very interested in the writers of the Spanish-speaking countries. Those two loves led me to a double major in animal physiology and Spanish literature. I volunteer at a local veterinary hospital and I plan on going to veterinary school.

Q. You chose Earl Warren College. What advantages do you find in UCSD's residential college system?

A. The campus is big. UCSD's five-college system makes it seem smaller and gives you a personal identity. I chose Earl Warren College because of its flexible general-education requirements. This school has a variety of classes, and you can change majors easily at Warren. And there are lots of programs like dances, barbecues, and volleyball games—even an Internet user's group.

I think it's important to live on campus, at least for the first year. There's a lot to do here, and you have to find out about the campus. The residence halls are nicer than I

ties for walkin
that's totally quiet.
San Diego. You see pe
on bicycles, skateboards,
They take those hills like they

Q. What would you advise ne students to help them adjust to college life?

A. Visit professors during their office hour study ahead of time, and take part in campus life. When I was in high school, my teachers would say, 'college is so hard.' So, I've been surprised by how helpful the UCSD faculty are. The professors post their office hours; they want you to see them.

Don't just stay in your room studying or you'll burn yourself out. Take advantage of everything here; there are so many things to do, all kinds of clubs and sports.

Q. How did you prepare for college?

A. I took advanced placement classes in high school, and those have really paid off. When I was in high school, I would say 'I'm doing all this extra work,' but now I realize that it really was worth it. I also had good grades, I belonged to lots of clubs, and I ran track in high school.

I was fortunate that, since my family moved from one country to another, coming to UCSD wasn't such a big transition for me. My parents are both college graduates, so going to college was never a question. It was the plan.

Q. What advice would you give prospective students?

A. High school students should have faith in themselves and they should not say, 'I could never make it.' Speaking with your high school counselor and counselors at UCSD is a great help. Also, I highly recommend taking a UCSD campus tour.

thought they would be. I was a bit apprehensive about getting a roommate, but that's been nice.

I'm planning to stay on campus through my sophomore year. Then I hope to spend my junior year studying abroad.

Q. When you're not studying, do you get involved in campus activities?

A. I like to run track and cross country. Also, because I participated in UCSD's Summer Bridge Program, I belong to the Bridge Alumni. We spent a month together, and now it feels like we'll be friends forever.

I'm still in search of the right club to join and I advise others to try them all to see what's right for you. I've looked into several ethnic organizations on campus, and am considering getting involved with UCSD's Habitat for Humanity group.

Q. How would you describe the UCSD campus?

A. There are lots of trees. I like to walk, and the UCSD campus offers so many opportuni-

And you can actually reach them. The teaching assistants (TAs) are great. They'll explain all the homework. You don't have to be afraid to go to the TAs or directly to the professors for assistance.

Try to do homework assignments as soon as possible—don't wait until the day before they're due. I study on weekend mornings while most people are asleep. I also read my class notes and highlight things to make them clear. I keep an agenda and highlight what I've done. I try to be organized (my mom would argue with that). I write everything down—you never know when you'll need it—like office hours. And don't lose the class syllabus. There's a reason it's provided.

Don't just stay in your room studying or you'll burn yourself out. Take advantage of everything here; there are so many things to do, all kinds of clubs and sports. Read t student newspaper, the *Guardian*, cut o coupons, get an e-mail account and messages to your friends. Find yo and do what you do best.

rfin

COLLEGE

SENIOR

HILLIP GARFIN, TWENTY-TWO, WON A FELLOWSHIP WHEN HIS NAME WAS DRAWN OUT OF A HAT. ONLY THEN DID HE DECIDE TO RETURN TO THE SCIENCES WITH HIS SIGHTS ON BECOMING A DOCTOR. WITH A DOUBLE MAJOR IN ANIMAL PHYSIOLOGY AND GENERAL LITERATURE, HE IS ALSO INTERESTED IN CLASSICAL STUDIES. UPON GRADUATION, PHILLIP PLANS TO PURSUE AN M.D./PH.D., WHICH HE HOPES WILL LEAD TO A FACULTY POST COMBINING ACADEMICS AND RESEARCH. HE CURRENTLY HAS A REGENTS SCHOLARSHIP AND A NATIONAL MERIT SCHOLARSHIP. THROUGH HIS FELLOWSHIP WITH THE HOWARD HUGHES UNDERGRADUATE SCIENCE ENRICHMENT PROGRAMS, PHILLIP WORKS IN A LAB AT UCSD'S SCHOOL OF MEDICINE.

Q. How would you describe your academic experiences at UCSD?

A. UCSD is very different from my high school in Oakland, although it was a private college prep school that prepared me well. Here, you have to learn how to be self-motivated. There is no one watching over your shoulder. You have one midterm and a final exam. There's no check point.

I classify myself as a nerd—I like the process of learning. But, I'm computer illiterate—I can play a couple of computer games.

I applied here as a physics major, then switched to biophysics. Then I got into the humanities writing sequences and liked the classics. I like ancient languages like Greek and Latin, so I switched to classical studies. I eventually chose general literature as my

other major because I could still do classical studies. It gives me a lot of freedom.

Q. Aside from academics, what opportunities does UCSD offer for campus involvement?

A. I have vast and varied interests. UCSD has so many people doing so many incredible things. There are lots of opportunities to get involved—athletic, academic, out in the community, and in your college. I love any and all kinds of athletics. I play intramural basketball, volleyball, soccer, and softball. We play a game called Hawaiian football where you can pass both ways at any time. Last year my team won the Single A Division within UCSD. I also just bought a new surfboard and I've been out once on it. I think 80 percent of UCSD students are athletes and the other 20 percent try. People don't feel pressured to compete, though.

I volunteer with a student group called Food for Thought. We collect food and feed the homeless in Balboa Park. We take no community money, and we pick up all the garbage before we leave.

Q. Most of your activities revolve around Revelle College. This year you live off campus, and last year you served as a resident adviser. What have been your experiences with the residential college system at UCSD?

A. UCSD has done a great job of making a big school into a small school. It's friendlier and more personable. There's a focus on the students. I can go into the provost's office and the staff know who I am—they treat me like I matter. The college staff and advisers are all very helpful. I like Revelle's curriculum and the focus on a well-rounded education. You have to take classes in science and math, social sciences, and humanities—all three groups. You're encouraged to study what you want. My roommate created his own major.

Activities are planned by the resident advisers, the dean's office, and the provost's office. Many activities are academic with a social setting, like 'meet a professor' or 'meet the provost.'

I belong to a student club called Revelle's Community Outreach Committee. We have fun doing community service, like beach clean-ups or working in a soup kitchen. We hold an annual Turkey Bowl, a fund-raiser where you actually bowl with frozen turkeys. We grease a forty-foot board with lard, and put bowling pins at the end.

Revelle's residences are large, very nice, and high quality. They're open around a communal space, which makes them extremely social. It's easy to meet people in your college. You start out in a suite of ten people; then you meet everyone on your floor. You meet people in your classes, the dining hall, or playing basketball.

Q. What advice can you offer incoming students?

A. Students should think about what they like doing rather than what they think they should do to make money later. I encourage other students to take every opportunity to seek guidance and support. The faculty is accessible, and UCSD has excellent student support facilities.

It's important to prepare mentally for college classes. The first quarter, classes are a real challenge if you're not ready.

I spent a summer studying in Italy. It really enhanced my college education. Studying abroad is different from traveling abroad as a tou
local lifestyle.

**Q. What is your idea o
experience?**

A. UCSD offers plenty of social lif
like those movies that portray colleg
twenty-four-hour party, where you can
star of the football team and the valedict
an. Mostly there are smaller groups of people hanging out and going to smaller parties. If you put in the effort to make friends, there's always something to do—free concerts, the Sun God Festival, campus activities and intercollegiate activities.

When I leave UCSD, I want to have a good education with a love of learning; I want to have made some friends that I'll keep. I want to say that UCSD has given me the ability to study, learn, think, and communicate. You can do a lot more if you can talk to people than you can with the most advanced degree.

The 'college experience' is learning how to relate to people, and how they relate to you. It's probably more important than the degree on your wall. You learn to think of each person as worthy of respect and attention.

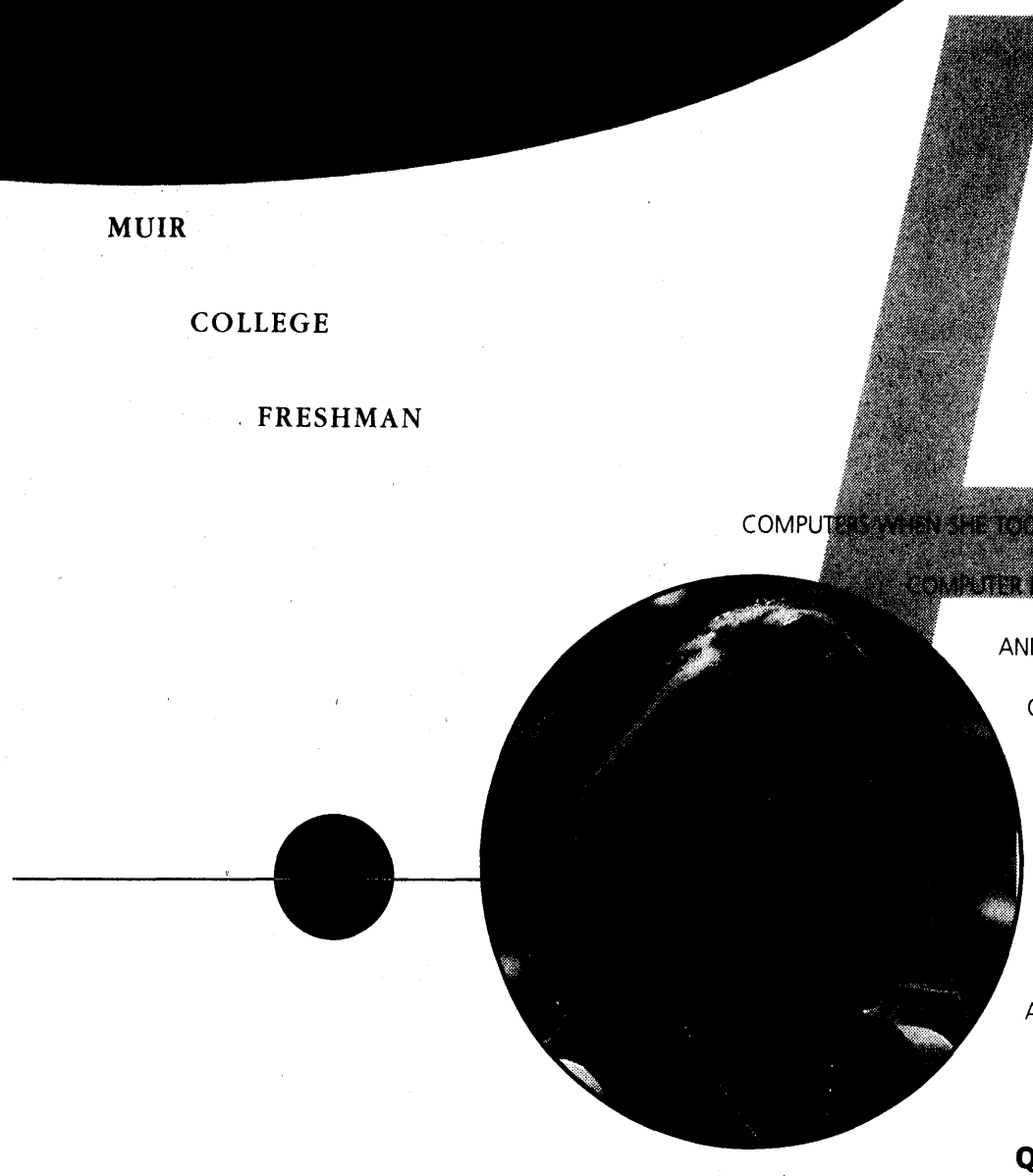
UCSD has done a great job of making a big school into a small school. It's friendlier and more personable. There's a focus on the students.

ith

MUIR

COLLEGE

FRESHMAN



MBER SMITH DIDN'T KNOW THE FIRST THING ABOUT COMPUTERS WHEN SHE TOOK HER FIRST COMPUTER CLASS. THROUGH CLASSES IN HER MAJOR, COMPUTER ENGINEERING, SHE'S LEARNED THE COMPUTER LANGUAGES, FORTRAN AND C++, AND NOW THOROUGHLY ENJOYS WRITING COMPUTER PROGRAMS. AMBER HASN'T SETTLED ON A CAREER YET, BUT KNOWS THE COMPUTER FIELD WILL OFFER LUCRATIVE REWARDS WHEN SHE GRADUATES. WITH THE PREVALENCE OF COMPUTERS IN VIRTUALLY EVERY FIELD, SHE IS ENCOURAGED BY REPORTS FROM CAREER FAIRS THAT COMPUTER PROGRAMMERS ARE OFFERED, ON AVERAGE, MORE JOBS AT HIGHER SALARIES THAN OTHER CAREERS.

Q. You were accepted at several universities. Why did you select UCSD?

A. After graduating from a small private high school, I didn't want to go to a private college. I'm from San Luis Obispo, California. I was so ready for college. I wanted a change and I was ready for a bigger city, but I wanted to stay near the beach. In my residence hall, I have an ocean view from my window.

I love exploring San Diego. I like the freeway system; it's so easy to get around. I also love the campus, especially at night when the fog comes in—all the yellow lights.

My high school was very small, with only 250 students. It didn't offer the classes that a big school would, so I missed out on a lot of the electives. I felt the purpose of high

school was to get me to college. I had high grades and my SAT scores weren't great, but they were good enough.

I was a cheerleader and a class officer for three years. I did a lot of community service. And I was vice president of the California Scholastic Federation.

Q. In what way has John Muir College been the right choice for you?

A. I love the environment, so the name really appealed to me.

The college system makes the campus a lot smaller. All the faces get familiar, and it's easier to meet people. Tioga residence hall is divided into houses, and there's a lounge between the suites. Men and women live there, and our house has been camping and rock climbing in Joshua Tree and up to the snow at Big Bear. Everyone studies a lot, but we're all close friends. On birthdays we go out to dinner together.

I like living on campus. It's so convenient, and I don't have to worry about parking every day. I can even go to a campus lab late at night if I need to.

My roommate is great. She's easy-going. We have very different interests and I've learned a lot about other people from her.

Q. Can you give new students a few study tips?

A. I found my niche and study before anyone else gets up. I also recommend a bean bag chair. I study in my bean bag.

Also, the fact that a college education is such a big financial investment is motivational.

It's important to keep up with the reading. Pretending you know the answers does you no good when you take a test.

Sometimes, I enjoy studying in the evening at a coffee house near the campus. People bring their laptop computers and study until one or two in the morning.

Q. You're carrying a heavy course load. How are you handling academic life?

A. UCSD is a very academic school, and everyone is serious about their grades, but there's always something going on. I recommend having a lighter load so you can do other things, like getting involved in campus activities or exploring off campus.

Last quarter I took seventeen units; this quarter I'm taking sixteen, and I'll go to summer school. I usually take classes till noon, then in the afternoon I may have a lab until 6:00 p.m. I have no free time and it's rough, but I'm doing it in order to get the engineering sequences done. It gets stressful, but I just do what I can.

Q. Do you find the UCSD faculty to be approachable and willing to help you?

A. I didn't expect the teachers to be on such a personal level with the students. They're really helpful and open to listening to you. They want you to visit during office hours. Professor Uang, of AMES [Department of Applied Mechanics and Engineering Sciences] is the greatest. He kept me interested the whole time, and he's one of the reasons I changed my major.

My Spar
me personally to r
event. I'm planning o
summer to finish my lang
ments.

**Q. Would you pass along a fe
your secrets for success?**

A. I run four miles each morning. It's im
tant to get exercise. It keeps me awake th
rest of the day. I've also played inner-tube water polo. There's always something athletic going on. And RIMAC [UCSD's state-of-the-art Recreational and Intramural Athletic Complex] is such a beautiful facility.

I also make sure to find time for myself. Last quarter I was always studying, and I needed time to be alone. Now I'm a lot happier. If you have a lot of different interests, colleges are more likely to accept you.

I like a lot of diversity in my life. I'm not a one-track-mind sort of person. Some people can spend hours and hours at their computer, then look up and say, 'what happened?' I want to be able to say I've developed as a person at UCSD, that I've gained more knowledge of other cultures and learned more about the world.

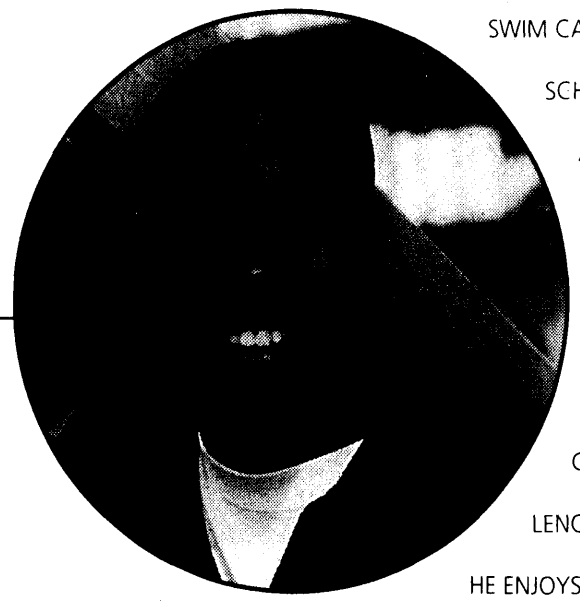
I want to be able to say I've developed as a person at UCSD, that I've gained more knowledge of other cultures and learned more about the world.

Lee Martin

ROOSEVELT

COLLEGE

FRESHMAN



LEE MARTIN, EIGHTEEN, HAS SO MANY INTERESTS THAT HE'S MAJORING IN ECONOMICS WITH TRIPLE MINORS IN LAW AND SOCIETY, ETHNIC CULTURES IN AMERICA, AND MUSIC. IN HIGH SCHOOL HE WAS A VERSATILE ATHLETE, THE VARSITY SWIM CAPTAIN, AND A MEMBER OF SEVERAL MUSIC BANDS. HE REPRESENTED HIS SCHOOL ON THE COMMITTEE FOR THE WESTERN ACCREDITATION OF SCHOOLS AND COLLEGES. LEE HAS SEVERAL PART-TIME JOBS, INCLUDING PLAYING PIANO AND DRUMS EVERY OTHER WEEKEND AT HIS CHURCH IN SANTA ANA. ON CAMPUS, HE WILL SOON BE WORKING FOR THE UCSD TELEPHONE OUTREACH PROGRAM, SOLICITING SUPPORT FOR UNIVERSITY PROGRAMS. IN ADDITION, HE WILL BE AN ORIENTATION LEADER FOR ELEANOR ROOSEVELT COLLEGE. LEE WAS ATTRACTED TO UCSD BECAUSE OF ITS ACADEMIC EXCELLENCE, THE BEAUTY OF ITS CAMPUS, AND THE DIVERSITY OF THE STUDENT BODY. HE ENJOYS THE FACT THAT STUDENTS COME TO UCSD FROM AS CLOSE AS A COUPLE OF MILES AWAY, AND FROM AS FAR AWAY AS KUWAIT.

Q. What have been your impressions in your first year at UCSD?

A. UCSD is teaching me how to become independent, how to study, and how to interpret facts. It will be the perfect preparation for law school. Academically, it's rigorous enough to prepare me for any graduate school in the world.

Q. Why did you choose Eleanor Roosevelt College?

A. I really like the five-college system at UCSD. It gives me a sense of belonging. I

can talk with my academic adviser or my dean, and there's no waiting in line.

Eleanor Roosevelt College encourages students to become citizens of the world. For instance, we take a course called The Making of the Modern World, which takes us through pre-history all the way up to today's newspaper—in six quarters. It shows us the cultures of the world, and their thoughts and ideologies. I want to study abroad, possibly Spain. We also get to know each other by playing cultural games such as 'Bafa Bafa' and 'Barnga.'

I like Roosevelt because it's the newest of the five UCSD colleges, and it's still growing. The staff is always open to student suggestions.

And living on campus makes it extremely easy to meet people.

Q. After taking five advanced placement classes at UC Riverside as a high school senior, you are in the enviable position—as a first-year student—of becoming a sophomore in the winter quarter. What tips would you offer high school students to help them prepare for college?

A. Those advanced placement classes introduced me to college life. It's not easy to learn about a college by just looking at pictures of it. It's important to visit the campus, sit in on classes, talk with the faculty and staff. People shouldn't be afraid to stop a student on the campus and say, 'I'm visiting the college. Can you tell me more about it?'

And apply early for financial aid!

My high school years in Corona [Riverside County, California] were a lot like my experience has been of UCSD. It was a big new high school, so everyone was new. There were no cliques, and it was easy to get involved.

I had a good grade-point average and decent SAT scores, but I think my involvement in high school activities made the difference in my being admitted to UCSD.

Q. What are your impressions of the staff and faculty?

A. I really enjoy the contact the college system offers. Staff and faculty are nice and accessible. I know my resident advisers, the faculty, the resident dean, the provost, and the dean of student affairs. I feel comfortable walking into a dean's office and asking questions.

Q. Which other campus activities do you participate in?

A. I sing in the UCSD Gospel Choir, I'm on the student council at Eleanor Roosevelt College, and I'm a member of my residence hall association. Also, I play intramural soccer and basketball.

For people like me who want to take part in everything, it's important to be cognizant of your
every activity. My
events and so does m
council puts on events; th
tural events, and clubs to joi

And San Diego has the be
days a week. I know a lot of peopl
every morning.

Q. Can you offer a few words of wisdom for new freshmen?

A. It's good to schedule your day. I try to organize and write everything down. UCSD is not like high school where teachers go back and review material. Here, something new is introduced in every class.

Students should get to know the campus. Of course, it's important to have a good time, but we need to remember why we're here—to get an education.

Most of all, you have to be your own person and major in what you enjoy.

I know my resident advisers, the faculty, the resident dean, the provost, and the dean of student affairs. I feel comfortable walking into a dean's office and asking questions.

on

MARSHALL

COLLEGE

SOPHOMORE

ANGIE POON, A TWENTY-YEAR-OLD THURGOOD MARSHALL COLLEGE SOPHOMORE, STRESSES THE NEED FOR BALANCE AS A STUDENT. IT'S IMPORTANT, SHE FEELS, TO FOCUS ON WORK, BUT STILL LEAVE TIME FOR FUN. ANGIE IS THE FIRST MEMBER OF HER FAMILY TO GO TO COLLEGE. SHE WAS BROUGHT UP WITH THE FEELING THAT SCHOOL IS FUN. HER COUNSELORS RECOMMENDED UCSD FOR ITS QUALITY OF EDUCATION, FACULTY ACCESSIBILITY, AND BEAUTIFUL CAMPUS. AS A BIOENGINEERING MAJOR, ANGIE HOPES TO BE A RESEARCH PHYSICIAN.

Q. UCSD is said to have a fast academic pace. How have you adjusted?

A. You can call me a nerd, I guess, but I really enjoy the concept of science, especially biology. When I learned that UCSD ranks extremely high nationally in bioengineering, I was, at first, concerned that I had gotten in over my head. I thought, 'Oh no, what have I done?' But then I told myself, 'I can do this.'

Time is the biggest factor. If you're not organized, you're not going to get through college easily. I assign days to studying, like 'this is math day' and 'this is physics day.' The quarter system means you have to always be on the ball. You blink and you

have a midterm; blink again and the quarter's over.

Q. How would you describe UCSD to prospective students?

A. At first glance, the UCSD campus appeared so big that I was a bit overwhelmed. I even brought my Mom with me. The campus is very nice, though. I like the sunshine. It's a calm atmosphere where you can focus on what you need to do. I thought college would be really rowdy, but, at UCSD, it isn't. I try to stay balanced. During the week I say, 'Let's go to the library,' and on Friday night I say, 'Let's go to a party.'

I recommend living on campus. All your friends are there. You can get information from other people that you'd never learn in a book. You have access to so many libraries and computers. Every night, there's something going on—you just have to walk outside. And the gym is two minutes from my residence hall.

Q. You mentioned diversity. Has the campus met your expectations in that way?

A. My high school was diverse, but not like UCSD. The first day I sat in a lecture hall with 300 people for the DOC (Dimensions of Culture) class, I looked around the room and said, 'wow, it looks like the United Nations.'

The class covers the areas of diversity, justice, and imagination. I had heard about it and I thought, 'I'm not a good writer,' but I got so much out of that class. We talked about life itself. It really opened my mind to other cultures, and I realized how ignorant or open-minded we are capable of being. We discussed issues like homosexuality, and the class teaches you not to be homophobic.

Q. You were very active in high school. Has that carried over to UCSD?

A. I was a majorette for eight years, and I've held ASB offices since the seventh grade. I like being involved in school. It gives me something to do besides 'veging' out at home. I played basketball and volleyball. I picked up tennis and ended up playing varsity tennis for three years and winning championships.

I actually kept up my grades in high school—my parents were shocked. I didn't have very good SAT scores, but I showed with my activiti[illegible] the effort, and all [illegible] for it.

I played flute until my [illegible] picked up the trumpet. And l[illegible] played in the symphonic band.

I think I had too much fun in [illegible] school, so when I came to UCSD, my [illegible] thought was, 'this is the time I need to study.' But I like all the opportunities to be involved in campus life. There are student organizations, conferences, group meetings. And the whole school puts on plays and festivals, where everybody can get involved and show they're a part of UCSD.

It really opened my mind to other cultures, and I realized how ignorant or open-minded we are capable of being.

I know UCSD looks for people who are well-rounded. Why would you want someone who's always stuck in a book? UCSD selects students who can get along with others, people who don't isolate from the world.

There's so much to do here. It's way better than high school. The people are so friendly and willing to have fun. You get to live on your own and take your own initiative. UCSD is more than I expected.

Q. What has been your experience at Thurgood Marshall College?

A. Thurgood Marshall College is like a small, very friendly community. We are more involved in our own little campus. After one year, you'll know practically everyone. We act as one big family; we look out for each other.

I like Marshall College's philosophy on diversity and culture. We put on an annual cultural celebration in the spring with games and entertainers.

I'm an active member of the Leadership Board. They accepted me as a freshman, which was unusual, and I was very honored. And this summer I'm going to be an orientation leader.

Q. Have you found any unusual student services at UCSD that make college life easier for you?

A. 534-EDNA is really cool. It's a telephone information line run by students. They can answer anything about the campus or the neighborhood. You can obtain a student's or a professor's phone number and you can even find out where to go bowling. I needed the name of a movie theater in San Diego, and they gave it to me. Say you forget where your class meets—they can tell you. As you can probably tell, I call them all the time.

Q. What do you want to take with you from your years at UCSD?

A. When I graduate I want to look back and say, 'I came out a well-rounded person.' I don't have to be extremely smart, but I want to say I tried my best, I made a contribution toward making UCSD what it is. I made a difference.

Key to course listings

Courses numbered 1 through 99 are lower-division courses and are normally open to freshmen and sophomores.

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

THE PROGRAM

The Academic Internship Program (AIP) offers qualified juniors and seniors, in any college at UCSD, the opportunity to gain experience related to their major field of study while working full- or part-time in an off-campus placement. Placements are designed to correlate with students' career goals.

Internships are available in a wide variety of settings: TV and radio stations, law firms, medical research labs and clinics, government agencies, high-tech companies, engineering other fields. Students can also work with the internship office to set up their own

Although most placements are in San Diego County, the AIP provides internships in Washington, D.C. with congressional and government offices, consumer interest sored housing is available in Washington, D.C.

In an internship, students can work from ten to forty hours a week for one or more quarters. They can earn a maximum of sixteen units of credit which may be taken in increments of four, eight, or twelve units per quarter. Students may also choose a zero-unit option. Internships are available in the summer as well as during the academic year.

A faculty adviser oversees the academic component of the four-, eight-, or twelve-unit internship, which consists of writing a research paper/project. The faculty adviser may also choose to assign relevant readings. Zero-unit internships do not require a faculty adviser.

The Academic Internship Program is a valuable form of professional training which provides students the opportunity to test their career interest in an off-campus setting.

Students planning an academic internship should apply to AIP at least one quarter before they wish to be enrolled in the program, or two quarters prior to a Washington, D.C., internship. Students planning to set up their own internships out of town are encouraged to apply to AIP two quarters in advance. Students have the option of undertaking one or more academic internships during their junior or senior year. Students must have completed ninety units, including at least two upper-division courses related to the internship field, and have at least a 2.5 GPA at the date of application.

197. Academic Internship Program (0-12)
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.

Advanced Manufacturing Program

See Engineering, School of.

African Studies Minor

OFFICE: 3071 Humanities and Social Sciences Building, Muir College (CAESAR office)

PARTICIPATING FACULTY

Professors

Bennetta Jules-Rosette, Ph. D., *Sociology, Coordinator*
Rae Blumberg, Ph. D., *Sociology*
Robert Cancel, Ph. D., *Literature, Acting-Coordinator*
Ivan Evans, Ph. D., *Sociology*
Robert Horwitz, Ph. D., *Communications*
Thomas E. Levy, Ph. D., *Anthropology*
Edward Reynolds, Ph. D., *History*
Kathryn L. Green, Ph. D., *History*
Marc J. Swartz, Ph. D., *Anthropology*
Quincy Troupe, B.A., *Literature*

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 Arts, 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, 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. universitites. A number of African languages are available through the UCSD De-

partment 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 six 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 Pre-Modern 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, societies, culture, and politics. Please contact Professor Robert Cancel in the Department of Literature, Literature Building, Rm. 3428, (619) 534-3986 or the Third World Studies Program, (619) 534-3276 or (619) 822-0377 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 Pre-modern Africa

ANRG 104. Traditional African Societies and Cultures (4)

ANRG 105. Ethnoarchaeology (4)

ANGN 168. Nature and Nurture: Race Gender, and Culture (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 101. Chiefdoms, States and the Emergence of Civilizations (4)

ANGR 203. Classics in African Ethnographies (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 181. Colonialism and Culture 181 (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 (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
North Campus

Professors

F. G. Bailey, Ph.D., *Professor Emeritus, Academic Senate Career Distinguished Teaching Award*
Roy G. D'Andrade, Ph.D.
David K. Jordan, Ph.D., *Provost, Warren College*
Thomas E. Levy, Ph.D.
Michael E. Meeker, Ph.D.
Theodore Schwartz, Ph.D.
Melford E. Spiro, Ph.D., *Professor Emeritus*
Shirley C. Strum, Ph.D.
Marc J. Swartz, Ph.D.
Donald Tuzin, Ph.D., *Chair*

Associate Professors

Guillermo Algaze, Ph.D.
James Holston, Ph.D.
Tanya M. Luhrmann, Ph.D.
Jim Moore, Ph.D.
Fitz John P. Poole, Ph.D.

Assistant Professors

Suzanne A. Brenner, Ph.D.

Adjunct Faculty

Robert McC. Adams, Ph.D., *Adjunct Professor, Anthropology*
Brian F. Byrd, Ph.D., *Adjunct Assistant Professor, Anthropology*
Nancylee Friedlander, Ph.D., *Adjunct Assistant Professor, Anthropology*

Associated Faculty

Edwin L. Hutchins, Ph.D., *Professor, Cognitive Science*
Martha Lampland, Ph.D., *Associate Professor, Sociology*
Paula F. Levin, Ph.D., *Lecturer, S.O.E., Teacher Education Program*
Lawrence A. Palinkas, Ph.D., *Associate Professor, Family and Preventive Medicine*
Lola Romanucci-Ross, Ph.D., *Professor, Family and Preventive Medicine, UCSD School of Medicine*
Christena Turner, Ph.D., *Associate Professor, Sociology*
Kathryn A. Woolard, Ph.D., *Associate Professor, Sociology*
Lisa Yoneyama, Ph.D., *Assistant 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 do-

mestic 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.

The Undergraduate Program

Lower-Division

Lower-division offerings in anthropology are concentrated mainly in two series of courses, ANLD 10, 11, 12 and ANLD 22, 23, and 24. Collectively, any three of the courses offered in the same year in the same series 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. The colleges differ as to which combinations constitute a "sequence" for purposes of filling college requirements. Consult your provost's office for the rules that currently apply to your college.

Students who intend to major or minor in archaeological anthropology are advised to take ANLD 11.

Students who intend to major or minor in biological anthropology must take ANLD 10 (or equivalent), which is prerequisite to all upper-division biological anthropology courses.

Students who have already completed ANPR 105, 106, and 107 may not receive academic credit for ANLD 22.

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 six anthropology courses. At least three courses must be upper-division; at least three 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, or Eleanor Roosevelt 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. Social Science 60 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 100, 101, 145.
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.

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. A handout listing these courses is available from the department's undergraduate coordinator.
3. Four four-unit courses in the Department of Biology. 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 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.

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, or (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.

The Graduate Program

The Department of Anthropology offers graduate training in social, cultural, and psychological anthropology. The graduate program is designed to provide the theoretical background and the methodological skills necessary for advanced research in the study of society and culture, for a career in 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, save by special waiver.

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 the full faculty.

Evaluation

In the spring of each year, the faculty evaluate each student's overall performance in course work and in research. 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.

Teaching

In order to acquire teaching experience, each student in the graduate program is required to participate as an assistant in the teaching activities designated by the department during one quarter in each of the student's first three years of residence. This obligation is discharged under the auspices of the course entitled "ANGR 500: Apprentice Teaching."

Course Requirements

Only one 290-level course may be taken in any one quarter until a student attains Ph.D. candidacy.

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 master's degree, but they are required by the department to complete the requirements for the master's degree.

Requirements for Master's Degree

Required Courses:

230A	Departmental Colloquium (4 quarters, 1 unit each)
280A-B-C	Core Seminars (4 units each)
281A-B	Introductory Seminars (1 unit each)
283A	Fieldwork Seminar (4 units)
295	Master's Thesis Preparation (1-12 units)
500	Apprentice Teaching (2 quarters, 4 units each)

Elective Courses

Four elective anthropology courses are required, to be taken for letter grades from at least three different instructors. Required courses may not be counted as elective courses.

Master's Thesis

A master's thesis is required. The thesis is to be written during winter quarter of the student's second year and turned in at the beginning of spring quarter. The thesis is super-

vised by a thesis committee, appointed in the winter quarter, whose approval of the thesis must be unanimous.

The Doctoral Degree

Admission to the doctoral portion of the program is open 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 addition to the courses required in the master's program, students are required to complete three additional letter-grade elective courses. One quarter of ANGR 500: Apprentice Teaching completes the required one quarter per year three-year obligation.

2. Quantitative Methods

Students are required to demonstrate competency in quantitative methods by examination.

3. Foreign Language

Knowledge of one foreign language is required for a doctoral degree. A student planning fieldwork in English-speaking areas is required to pass a departmental examination in a foreign language. The language submitted for examination must receive prior approval by the student's departmental committee. The exam is administered by a member of our faculty appointed by the department chair and consists of an oral translation of part of an anthropology article into English. A student wishing to use a non-English fieldwork language to satisfy this degree requirement must submit a written plan describing (1) the linguistic affiliations of the language(s) to be used in fieldwork, (2) the training necessary to attain a level of proficiency adequate for fieldwork in the language(s), and (3) the student's present proficiency. If the student's proficiency is less than that needed, the plan should also describe (4) reasonably available facilities for studying the language(s), and (5) procedures which the student has followed or will follow to attain the necessary proficiency. The written plan is a requirement for Ph.D. candidacy, but proficiency itself is a requirement for the Ph.D. degree. Successful completion of a dissertation based on fieldwork using the language of the plan is accepted as evidence of successful mastery of the language.

4. Formation of the Doctoral Committee

Students are expected to select the chair of their doctoral committee before registration for the winter quarter of the third year. The chair of the doctoral committee serves as the student's adviser for the remainder of the student's program. In consultation with the chair of the doctoral committee, two more departmental committee members are selected, and two additional faculty members from outside the department. The final composition of the committee must be approved by the Office of Graduate Studies and Research.

5. Prefield Qualifying Examination

After completion of the above requirements, the student stands for the doctoral qualifying examination, 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 (see below). Successful completion of this examination marks the student's advancement to doctoral candidacy.

6. The Fieldwork Proposal

After admission to the doctoral portion of the program, each student prepares a dissertation research proposal to serve as the basis of the prefield oral qualifying examination. The dissertation research proposal sets forth a specific plan of research, normally involving intensive fieldwork. ANGR 296A, B provide an opportunity for the development of such a proposal. Students typically begin these courses in the fall of their third year to allow the fieldwork proposal to be developed in connection with the deadlines of external fieldwork funding agencies.

When the proposal is informally judged by committee members to be ready to be defended, the oral qualifying examination is scheduled. It is administered by the student's full doctoral committee. At least two weeks must elapse between the appointment of the doctoral committee and the qualifying examination.

A copy of the student's field research proposal must be in the hands of all doctoral committee members ten days before the oral qualifying examination and a one-page abstract distributed to all members of the faculty.

7. 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. 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 hearing. It is understood that the edition of the dissertation given to committee members will not be the final typing, and that the committee members may suggest changes in the text at the defense. This examination may not be conducted earlier than three quarters after the date of advancement to doctoral candidacy. 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.

8. Time Limits

Pre-candidacy status is limited to four years. Candidates for the doctorate remain eligible for university support for eight years. The doctoral dissertation must be submitted and defended within nine years. This is in accordance with university policy.

Introduction to Required Courses

ANGR 280A-B-C. Core Seminars in Anthropology. This sequence of seminars constitutes the foundation of the first year of graduate study. These seminars are concerned with both contemporary and historical problems in cultural, social, and psychological anthropology. Each seminar will focus upon a series of significant debates concerning anthropological theory and data.

ANGR 281A-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.

ANGR 283A. Fieldwork Seminar. A seminar given in the first year to acquaint students with the techniques and problems of fieldwork. Students carry out ethnographic field research in a local community group under faculty supervision.

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.

COURSES

NOTE: For specific course offerings, check the Schedule of Classes issued fall 1996, winter 1997, and spring 1997.

ANTHROPOLOGY: LOWER-DIVISION

ANLD 10. Human Origins: Human Evolution (4)
An introduction to human evolution from the perspective of physical anthropology, including evolutionary theory and the evolution of the primates, hominids, and modern man. Emphasis is placed on evidence from fossil remains and behavioral studies of living primates. *(Prerequisite for upper-division biological anthropology courses.)*

ANLD 11. Human Origins: 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 12. Human Origins: Evolution of Society (4)
An introduction to theories of sociocultural evolution, with emphasis on the differences in human experience in the transition from hunting and gathering societies through tribal societies to the world of the modern state.

ANLD 22. Cultural Anthropology: Introduction (4)
An introduction to the anthropological approach to understanding human behavior, with an examination of data from a selection of societies and cultures.

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 24. Cultural Anthropology: Symbols (4)
This course focuses on symbolic representations and their significance in daily life. Topics include ritual and religious symbolism, body symbolism, the symbolism of sex and gender, and the manipulation of symbols to establish and transgress social boundaries.

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 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 194. Archaeological Field School (4-8)
This course takes place on UCSD archaeological expeditions in Israel, Turkey, and the eastern Mediterranean lands. It is an introduction to the design of research projects, the techniques of data collection, and the methods of excavation. *Prerequisite: none.*

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. In Search of Ourselves (4)
An approach to understanding human behavior through the investigation of the social behavior of living monkeys and apes. Historical review of primate studies with emphasis on changes in interpretation of social patterns. *Prerequisites: ANLD 10 and upper-division standing.*

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: ANLD 10, one other course in biological anthropology, and consent of instructor. Department approval required. Upper-division standing.*

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. *Prerequisites: upper-division standing. ANLD 10 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 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 and 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: any one of the following: ANLD 10, 42, BILD 3, or consent of instructor. Upper-division standing.*

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. *Prerequisites: ANLD 10 and upper-division standing.*

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. *Prerequisites: upper-division standing. ANLD 10 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. *Prerequisites: ANLD 10 or equivalent. Upper-division standing.*

ANBI 180. Anthropology of Aging (4)
This course examines aging from an anthropological perspective. Course material includes evolutionary theories regarding life span and senescence, overviews of biological and social aspects of aging in humans, and studies of aging in other societies from biological and cultural perspectives. *Prerequisites: upper-division standing.*

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 analyses of skeletal remains. Research paper required. *Prerequisites: ANLD 10 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 10 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. 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: upper-division standing. ANLD 11 is recommended.*

ANGN 101. 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: upper-division standing. ANLD 11 is recommended.*

ANGN 102. Early Urbanism (4)
The origins of the earliest cities in the Old (Mesopotamia) and the New World (Mesoamerica and the Andes) are investigated. Cross-cultural similarities and differences are highlighted in both the form and nature of early cities in these contrasting areas. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

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 ethnoarchaeological sources for understanding such topics as prehistoric hunter-gatherer adaptation, culture change, social organization, and intergroup interaction. *Prerequisite: upper-division standing. ANLD 11 is 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. *Prerequisites: upper-division standing. Permission of instructor. Anthropology majors only.*

ANGN 105. Ethnoarchaeology (4)
Ethnoarchaeology is a recently developed field where archaeologists live and work among contemporary societies like ethnographers, with the aim of understanding how such communities use material culture. Course examines the impact of ethnoarchaeology with case studies from the Middle East and Africa. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

ANGN 108. Peasant Organization and Conflict (4)
A study of peasant social and political movements, with emphasis on the effects of village organization and the relations between village and urban society. *Prerequisite: upper-division standing.*

ANGN 110. The Study of Society (4)
Readings and discussion of selected books addressing different problems in modern society and culture: the state, colonialism, underclass, democracy, nationalism, and capitalism. Examples of authors are Hobsbawn, B. Anderson, Foucault, Said, Rogin, de Tocqueville, Jencks, A. Hirschman. *Prerequisite: major in anthropology or consent of instructor.*

ANGN 113. Theories of Modern Subjectivity (4)
The course will examine selected writings that have influenced anthropological theories of modern subjectivity. Topics will include capitalism, religion, and nationalism. Readings will include excerpts from the work of major theories of society as well as ethnographic studies. *Prerequisite: upper-division standing.*

ANGN 115. Marriage and Family Life in Cultural Perspective (4)
Sources of power, relationships, and means for spouses and family members to strive for their goals are examined emphasizing shared beliefs and values. Family relations in different societies are considered as well as the consequences for the individual, family, and society. *Prerequisite: upper-division standing or consent of instructor.*

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 123. National Character (4)
The course surveys work done on the national character of a selection of modern nations, including the United States. A variety of types of data will be examined, including movies and novels. Theoretical and methodological issues will be discussed. *Prerequisite: ANLD 22 or consent of instructor.*

ANGN 124. Sex, Love, and Culture (4)
Cultural and psychological factors in sexual behavior and sex-related roles both within and beyond the social context of the family explored. Evolutionary and cross-cultural perspective. Symbolic elaboration of sex and replacement of "arranged" with "love" relationships also examined. *Prerequisite: upper-division standing.*

ANGN 126. Craft Specialization and Production (4)
Craft specialization and production are major forces in promoting culture and change. By studying these activities in archaeological and ethnohistorical contexts, many of the processes responsible for change in subsistence, social organization, and economy can be elucidated. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

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, and distributed wealth. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

ANGN 133. Advanced Topics in Psychological Anthropology (4)
Several topics will be selected for in-depth study at a graduate-equivalent level. Includes theoretical models of culture in relation to normal and abnormal behavior. *Prerequisite: ANPR 107 or consent of instructor based on advanced standing in a related field.*

ANGN 134. Paleolithic Cultures of the World (4)
Examines the archaeological background to human evolution and the foundation of regional prehistoric cultures in the Old World and the peopling of the Americas. *Prerequisite: upper-division standing. ANLD 10 and ANLD 11 are recommended.*

ANGN 138. Archaeological Perspectives on Exchange (4)
Cross-cultural exchange is a powerful motor in the evolution of social complexity. This course examines archaeological evidence from the Old and New Worlds for the role of exchange in the diffusion of early technologies and the emergence of early state societies. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

ANGN 139. Religious Cults and Social Movements (4)
Religious cults and social movements are studied, particularly as they enter into rapid cultural and social change. Relations between cults and movements in form and process are examined in a variety of specific cases. *Prerequisite: upper-division standing.*

ANGN 140. Anthropology and History (4)
Course explores long-standing debates concerning the character of sociocultural anthropology as historical inquiry, the nature of historiography in anthropology, and analyses of non-Western "people without history." It attends to history, myth, and time in ethnographies conceived as historical constructions. *Prerequisite: upper-division standing.*

ANGN 141. Religion and Society (4)
A comparative study of religion as a cultural system. The analysis will focus on the relationship between religion and its social and psychological determinants as well as its social and psychological functions. Materials are drawn from Western and non-Western, primitive and high religions. *Prerequisite: upper-division standing.*

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 11 is recommended.*

ANGN 145. 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: upper-division standing. ANLD 11 is recommended.*

ANGN 147. Ritual and Symbolism (4)
An examination of the place of symbols in the ritual systems of small-scale societies, and a critical evaluation of theoretical models commonly applied to their analysis and interpretation. *Prerequisite: upper-division standing.*

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. *Prerequisite: upper-division standing.*

ANGN 151. Political Anthropology (4)
An examination of the political processes at the local level, with emphasis on examination of supports for various aspects of the processes considered (e.g., leadership, factionalism, etc.). *Prerequisite: upper-division standing.*

ANGN 153. History of Anthropology (4)
An overview of the development of anthropology, with particular emphasis on developments centering around the concepts of "culture," "society," and "personality." *Prerequisite: upper-division standing.*

ANGN 156. Kinship and Descent (4)
This course reviews the approaches of British, French, and American anthropology to the subjects of kinship and descent, while also incorporating the relevant findings of behavioral biology and an historical perspective. *Prerequisite: upper-division standing.*

ANGN 158. Psychoanalytic Anthropology (4)
A critical examination of the anthropological works of Freud and of selected Freudian anthropologists and an assessment of their influence on anthropological theory. *Prerequisite: upper-division standing.*

ANGN 163. Technological Revolutions and Evolution (4)
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. *Prerequisite: upper-division standing.*

ANGN 168. Nature and Nurture: Race, Gender, and Culture (4)
The course examines concepts and controversies regarding the relationship of race, gender, and other variables to intelligence, cognition, and behavior in their biological, psychological, social, and cultural contexts. *Prerequisite: upper-division standing.*

ANGN 171. Culture and Identity: Cultural Constructions of Person, Self, and Individual, and Their Social and Personal Significance (4)
This course will explore the interconnections of various facets of cultural understandings of identity and the social and psychological significance and force they come to have in community life and for individuals. The focus will be ethnographic and cross-cultural. *Prerequisite: upper-division standing.*

ANGN 175. The Archaeology of Death (4)
By examining new studies on the disposal of the dead, this course critically examines different theories concerning social organization and culture change. The relationship between status, diet, disease, mortality, and different burial practices is also discussed. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

ANGN 176. Cultural Evolution (4)
Beginning with the relationship of biological and cultural evolution, this course will survey the history, theories, and possible application of theories concerning the evolution of culture, examining the state of present world culture and its future in this context. *Prerequisite: upper-division standing.*

ANGN 180. The Culture of Children (4)
This course explores the interrelationships of cultural, psychological, and social aspects of socialization and enculturation with respect to contemporary views of child development in psychological anthropology. Emphasis is given to examining the cultural world of children's experience. *Prerequisite: upper-division standing.*

ANGN 191. Seminar in Medical Anthropology (4)
(Same as Contemporary Issues 181.) Advanced medical seminar examines theory and method in the analysis of studies and research projects through surveying the literature and clinical situations (medical anthropology writings, medical grand rounds, epidemiology). *Prerequisites: upper-division standing. Department approval required.*

ANGN 193. Witchcraft, Shamanism, and Psychiatry (4)
Witchcraft accusation and practice in premodern and modern societies, shamanic practice, and psychiatry discussed. Underlying question is, how does therapy work, and what are the underlying commonalities of these three different therapeutic and explanatory discourses? *Prerequisite: upper-division standing.*

ANTHROPOLOGY: REGIONAL

ANRG 101. Near Eastern Prehistory (4)
The earliest agricultural villages and complex civilizations in the world arose in the Near East. This course will review archaeological evidence for these processes and the varying theoretical models that have been proposed to explain them. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

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 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 117. Gender across Cultures (4)
This course explores gender, as a principle of social and symbolic differentiation, cross-culturally. Using case studies from Asia, Africa, the Middle East, Oceania and the Americas, we examine relationships among gender, kinship, economics, politics, and social change. *Prerequisite: upper-division standing.*

ANRG 119. Modern and Postmodern Urbanism (4)
(Same as USP 159) This course critically examines theories of modern and postmodern urbanism in the context of Southern California, with reference to urbanization elsewhere. Topics include peripheral development, public space, urban experience, antiurbanism, multicultural citizenship, social and spatial polarization, interactive architecture, and "third-worldization." *Prerequisite: upper-division standing.*

ANRG 120. American Values (4)
This course examines the current social science theories and data concerning American values, including ethnographic and survey materials. Students will be expected to critique current work and to undertake research on special topics involving American values. *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 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 126. The Rise of New World Civilizations: Mesoamerica and the Andes (4)
This course is a comparative introduction to the prehistory of the great ancient civilizations of Central and South America. It will focus on the development of complex societies in Central Mexico, the Mayan areas, and the Andes. *Prerequisite: upper-division standing. ANLD 11 is recommended.*

ANRG 133. Politics and Modernity: Urban Cultures in Latin America (4)
Course explores four interrelated themes of urban culture in Brazil, Argentina, and Chile: social inequalities, violence and everyday life, political culture and citizenship, and new social movements in relation to democracy and legal pluralism. Comparative, historical, and anthropological readings emphasized. *Prerequisite: upper-division standing.*

ANRG 134. The Cultures of Mexico (4)
(Same as Cult. Trad. 134.) Various aspects of the multiple cultures of Mexico from the anthropological perspective will include field studies by anthropologists, focusing on changing emphases in investigative style and analyses, peasant communities, ejidos, studies of elites, indigenous "Indian" cultures, and culture change. *Prerequisite: upper-division standing or consent of instructor.*

ANRG 135. Indian Society (4)
A study of the social structure of India, with particular reference to caste and political organization. *Prerequisite: upper-division standing.*

ANRG 137. Societies and Cultures of Melanesia (4)
Consideration of the history and development of Melanesia and of selected societies within that area of the Pacific, with particular reference to the cultures and social structures which have developed there. *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 11 is recommended.*

ANRG 162. Peoples of the Middle East (4)
An introduction to the social and political traditions of the tribal and peasant peoples of the Middle East. Some attention will be devoted to an interpretation of the oral literature of these peoples as a means for understanding these traditions. *Prerequisite: upper-division standing.*

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. (This introductory course is a prerequisite to other upper-division anthropology courses on China.) *Prerequisite: upper-division standing, or consent of instructor. (Formerly AN 144.)*

ANRG 171. Chinese Familism (4)
This course explores the ethnography of family life in traditional China and the theoretical issues raised by Chinese familism for our understanding of family life in general and for other aspects of Chinese culture. *Prerequisite: ANRG 170 (formerly AN 144) or consent of instructor. (Formerly AN 109.)*

ANRG 172. Culture and Personality in China (4)
Chinese personality formation and value orientations as seen in recent studies of personality and culture of Chinese population. Stress is on noncommunist Chinese. *Prerequisite: ANRG 170 (formerly AN 144) or consent of instructor. (Formerly AN 136.)*

ANRG 173. Chinese Popular Religion (4)
The religious world of ordinary Chinese of precommunist times, with some reference to major Chinese religious traditions. Particular emphasis on the relation between popular religion and other aspects of Chinese personality or culture. *Prerequisite: ANRG 170 (formerly AN 144) or consent of instructor. (Formerly AN 103.)*

ANRG 173-L. Chinese Popular Religion: Language Maintenance Annex Course (2)
Anthropology discussion section intended as a Chinese language maintenance course for returning EAP students, *not* for native speakers of Chinese. This section, conducted mostly in Mandarin, discusses Chinese texts of varying difficulty linked to ANRG 173. *Prerequisite: co-registration in ANRG 173.*

ANGR 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. The Evolution of Mind in Culture (4)
Course provides a current synthesis of the line of thought that places the human mind or intellect, and more broadly, human personality, in the constitutive context of cultural evolution. Reference is made to current cognitive and cultural evolutionary theory. *Prerequisite: graduate standing or consent of instructor.*

ANGR 202. Cultural Belief Systems: Rationality and Relativism (4)
This course explores selected problems in anthropology, cognitive psychology, and philosophy that converge in analytic assessments of the "logic" of cultural belief systems as theoretical constructions. *Prerequisite: graduate standing in anthropology.*

ANGR 203. Classics in African Ethnographies (4)
Classics in African ethnography are the core here with emphasis on both their descriptive and theoretical contributions. Students will be asked to write a short set of weekly reading notes and a final synthetic and comparative paper. *Prerequisite: graduate standing in anthropology or consent of instructor.*

ANGR 205. Research Seminar on New Age Religion (4)
Direct research on organized and unorganized forms of "New Age Religion," its core beliefs, expressions, and practices, its meaning and place in the histories of individuals and groups. *Prerequisite: graduate standing.*

ANGR 207. Taiwan (4)
History and ethnography of Chinese society in Taiwan. This seminar includes discussions of a shared reading list and papers by seminar participants on specialized topics relating to Taiwan. *Prerequisite: graduate standing or consent of instructor.*

ANGR 208. Person, Self, and Individual: The Sociocultural Shapes of Identity and Their Psychological Force (4)
This seminar will explore contemporary debates in anthropology concerning the confluence of the cultural construction of ideas of identity, their social significance in community life, and their psychological salience and force for individuals. Readings will be drawn from anthropology, philosophy, and psychology. *Prerequisite: graduate standing.*

ANGR 210. Social Conflict and Democracy in Brazil (4)
This course examines the processes and dilemmas of democratization in Brazil. Focusing on both social practice and political institutions, it analyzes four historically related issues: Social inequality, violence, citizenship, and new social movements. *Prerequisite: graduate standing or consent of instructor.*

ANGR 211. Human Nature (4)
This seminar will examine the anthropological and related literatures with respect to theories and data about human nature. Biological, psychological, and cultural facets of the controversy about the nature of human nature will be reviewed. *Prerequisite: graduate standing or consent of instructor.*

ANGR 212. Character and Institutions (4)
This seminar will examine the literature concerning the effects of sociocultural institutions on the formation of character. The emphasis will be on data from complex societies. Problems concerning character assessment under field conditions will be considered. *Prerequisite: graduate standing.*

ANGR 213. Anthropological Understanding and Philosophy of Social Science (4)
The seminar focuses on current anthropological debates concerning interpretation and explanation, relativism, rationality, agency and personhood, and related concerns from perspectives of philosophy of social science. Readings are drawn from works of Gellner, Hempel, Popper, Putnam, Taylor, Winch, and others. *Prerequisite: graduate standing in anthropology (or other graduate standing with the explicit permission of the instructor).*

ANGR 214. Writing Proposals for Dissertation Research (2)
This seminar is intended to guide graduate students in writing dissertation research proposals. Students will learn how to write proposals that are theoretically, ethnographically, and methodologically sound. The processes of preparing for and conducting fieldwork will also be discussed. (S/U grades only.) *Prerequisite: graduate standing in anthropology.*

ANGR 215. Exchange Theory (4)
This course will examine recent work on exchange theory in linguistics, economics, and psychoanalysis, beginning with an introduction to the topic through the works of Simmel, De Saussure, and Mauss. *Prerequisite: graduate standing.*

ANGR 216. Law and Society (4)
This course emphasizes the importance of social conflict and cultural values in constituting legal systems. It also examines the role of law in defining forms of rule and processes of change, especially in the context of democratization. *Prerequisites: graduate standing. Undergraduates with permission of instructor.*

ANGR 218. Cognitive Anthropology (4)
This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethnoscience, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

ANGR 219. Seminar in Political Anthropology (4)
The focus here is "politics," broadly construed, in various societies. Analysis is from the perspective of the resources deployed by all involved, including but not limited to power, with emphasis on the role of culture and social structure. *Prerequisite: graduate standing.*

ANGR 220. Theoretical Issues Concerning Cultural Evolution (4)
Course deals with "cultural evolution," objections, responses, and current formulations, considering both Darwinian and non-Darwinian models. It goes beyond the socio-technological to consider the participation of aesthetics, morality, and "mind" in the evolution of culture. *Prerequisite: graduate standing.*

ANGR 221. Community and Morality: Modernist Subjectivities and the Problem of Affiliation (4)
The course will explore the organization of community, with attention to the institutional, social, psychological, and moral analysis of group behavior. *Prerequisite: graduate standing.*

ANGR 222A-B-C. Anthropology in Melanesia (4-4-4)
Explores selected aspects of Melanesian ethnography with special attention to the interrelationship of theory, ethnographic region, and single-society studies. Individual research required. *Prerequisite: completion of first year of graduate study in anthropology or consent of coordinator. (S/U grades only.)*

ANGR 223. Intensive Interviewing in Anthropology (4)
The course teaches techniques of long-term, intensive interviewing in fieldwork settings, with an emphasis on psychodynamic inference and its usefullness 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 225. Rhetorical Tradition and Social Experience (4)
The course reviews ethnographies of rhetorical traditions which explore the connection of rhetoric with social institutions and experiences. *Prerequisite: graduate standing.*

ANGR 227. Contemporary Social Theory (4)
This course discusses contemporary social theory, focusing on basic suppositions about the constitution of modern society and the logic of social explanation. It evaluates the importance of developing new social theory in anthropology. *Prerequisite: graduate standing.*

ANGR 230A. Department Colloquium (1)
Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-M.A. level. (S/U grades only.)*

ANGR 230B. Department Colloquium (1)
Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-fieldwork level (Ph.D. candidacy). (S/U grades only.)*

ANGR 230C. Department Colloquium (1)
Forum for presentation of papers by students, faculty, and guests. Course will be offered quarterly. *Prerequisite: graduate standing in anthropology at post-fieldwork level (dissertation write-up level). (S/U grades only.)*

ANGR 232. Current Research Topics in Psychological Anthropology (2)
Discussion of current work in psychological anthropology. Topics will include research by faculty and students as well as work reported in conferences and recent publications. *Prerequisite: graduate standing. (S/U grades only.)*

ANGR 234. Dynamics of Culture (4)
Examination of the actual operation of culture with attention to the importance of cultural products and social structure. Course goal is to develop skill in understanding the influence, direct and indirect, of culture on behavior. *Prerequisite: 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 236. Images of History in Anthropology (4)
This seminar explores long-standing and recent debates in anthropology on the nature of history and historiography in the constitution of theories of culture and society. Complementarily, it also examines how sociocultural theory has been appropriated in historical studies. *Prerequisite: graduate standing.*

ANGR 238. The Construction of Modern Societies: 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 243. Voice and Text in the Practice of Authority (4)
A claim to social or political legitimacy is founded on presuppositions about the relationship of voice and text. The seminar will explore this proposition by considering recent ethnographic and theoretical works on oral and written media in different societies. *Prerequisite: graduate standing.*

ANGR 245. Culture and Economy (4)
This seminar explores the social and cultural dimensions of economic production, exchange, consumption, and value. Through studies of non-Western and Western societies, we consider how economic practices are linked to gender, hierarchy, power, and other aspects of social life. *Prerequisites: graduate standing, and open to qualified upper-division undergraduates with consent of instructor.*

ANGR 246. Humans in Evolutionary Perspective (4)
Human behavior and culture are the result of 60 million years of primate evolutionary history. This seminar will examine the important events in that history, with an emphasis on evolutionary processes and adaptive aspects of behavior. *Prerequisite: graduate standing in anthropology.*

ANGR 248. Research Practicum in the Assessment of Personality in Cross-Cultural Context (4)
This practicum will be devoted to developing the techniques and skills needed for personality assessment in anthropological field work. A variety of assessment models will be used and problems of reliability and validity stressed. *Prerequisites: graduate standing in anthropology. Completion of ANGR 280C.*

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 255. Political Culture and Market Institutions (4)
The course considers the way in which social relations are affected by the evolution of market institutions and associated political traditions, with a special emphasis on the United States. Readings will include selections from Polanyi, de Tocqueville, Hartz, Rogin, and Simmel. *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 276. Anthropology and Language (4)
This course is designed to provide graduate students in anthropology (1) with an overview of linguistic concepts of possible relevance to ethnographic fieldwork, and (2) with an introduction to conceptions of language that have informed the development of anthropological theory.

ANGR 280A-B-C. Core Seminar in Anthropology (4-4-4)
The core seminar is taken by all first-year graduate students. The first quarter focuses on individual action and social institutions; the second on personal consciousness and cultural experiences; and the third on motives, values, cognition, and qualities of personal experience. *Prerequisite: first-year graduate student in anthropology.*

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 in the first year 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: first-year graduate student in anthropology. Offered in the winter quarter of the first year.*

ANGR 283C. Theoretical Foundations of Fieldwork (4)
This course will examine the theoretical and philosophical foundations of field research, including classic and current debates and positions. *Prerequisite: graduate standing in anthropology.*

ANGR 294. Informant Work (1-4)
When available, students will receive training, practice, and experience in working with a member of another culture. Students will elicit and analyze linguistic and cultural information in anticipation of field research in other cultures. *Prerequisite: graduate standing or consent of instructor. (S/U grades only.)*

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 normally be taken in the winter of 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 (1-4)
Anthropology graduate students participate in the undergraduate teaching program for one quarter per year for the first three years. Equivalent to duties expected of a 50 percent teaching assistant. Enrollment for four units documents the Ph.D. requirement. *Prerequisite: graduate standing in anthropology.*

Applied Mechanics and Engineering Sciences (AMES)

See Engineering, School of.

Applied Ocean Science

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

ASSOCIATED FACULTY

Professors

Michael J. Buckingham, Ph.D., *SIO; MPL*
LeRoy M. Dorman, Ph.D., *SIO; GRD*
Carl H. Gibson, Ph.D., *AMES; SIO*
Robert T. Guza, Ph.D., *SIO; CCS*
John A. Hildebrand, Ph.D., *SIO; GRD; MPL*
William S. Hodgkiss, Ph.D., *SIO; MPL*
William A. Kuperman, Ph.D., *SIO; MPL*
W. Kendall Melville, Ph.D., *SIO; MPL*
Robert Pinkel, Ph.D., *SIO; MPL*
Richard C.J. Somerville, Ph.D., *SIO; CRD*
Clinton D. Winant, Ph.D., *SIO; CCS*

Professors Emeritus

Hugh Bradner, Ph.D., *AMES; IGPP*
Douglas L. Inman, Ph.D., *SIO; CCS*
George G. Shor, Jr., Ph.D., *SIO; MPL*
Fred N. Spiess, Ph.D., *SIO; MPL*
Charles W. Van Atta, Ph.D., *AMES; SIO*
Kenneth M. Watson, Ph.D., *SIO; MPL*

Associate Professor

Bradley T. Werner, Ph.D., *SIO; IGPP*

Lecturers

Jules S. Jaffe, Ph.D., *SIO; MPL*
John L. Largier, Ph.D., *SIO; CCS*
Richard J. Seymour, Ph.D., *SIO; CCS*
Spahr C. Webb, Ph.D., *SIO; MPL*

Associated Research Staff

Christian P. de Moustier, Ph.D., *SIO; MPL*

Associated Research Groups

Marine Physical Laboratory, *MPL*
Institute of Geophysics and Planetary Physics, *IGPP*
Marine Research Division, *MRD*
Geological Research Division, *GRD*
Center for Coastal Studies, *CCS*
Climate Research Division, *CRD*

The Graduate Program

Applied Ocean Science (AOS) is an interdepartmental Ph.D. program concerned with humans' purposeful and useful intervention in the sea. 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 Applied Mechanics and Engineering Sciences (AMES), 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. The necessary undergraduate preparation for admission will be that required by the department to which the student applies.

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)

AMES 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.

Since the first year's course work is almost entirely devoted to the AOS core courses, that time provides an excellent opportunity 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.

Biochemistry

Students wishing to major in biochemistry should refer to programs offered by the Department of Biology, 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 Department of Biology and the Department of Chemistry and Biochemistry offer graduate programs with specialization in biochemistry. Those programs are described in the biology and chemistry and biochemistry sections of this catalog.

Bioengineering

See Engineering, School of.

Biology

STUDENT AFFAIRS OFFICE
1128 Pacific Hall
(619) 534-2786 (undergraduate)
(619) 534-3835 (graduate)

FINANCIAL AND ADMINISTRATIVE OFFICES
1610 Urey Hall, Revelle College

Professors

Darwin K. Berg, Ph.D.
Jack W. Bradbury, Ph.D.
Stuart Brody, Ph.D.
Ted J. Case, Ph.D.
Maarten J. Chrispeels, Ph.D.
Russell F. Doolittle, Ph.D., *Research Professor*
Richard W. Dutton, Ph.D.
Richard A. Firtel, Ph.D.
Douglass J. Forbes, Ph.D.
Morris E. Friedkin, Ph.D., *Emeritus*
E. Peter Geiduschek, Ph.D., *Research Professor*
Michael E. Gilpin, Ph.D.
Melvin H. Green, Ph.D.
Clifford Grobstein, Ph.D., *Emeritus*
William A. Harris, Ph.D.
Masaki Hayashi, Ph.D., *Emeritus*
Stephen M. Hedrick, Ph.D., *Chair*
Donald R. Helinski, Ph.D., *Research Professor*
John J. Holland, Ph.D., *Research Professor*
James T. Kadonaga, Ph.D.
William B. Kristan, Jr., Ph.D.
Dan L. Lindsley, Ph.D., *Research Professor*
William F. Loomis, Jr., Ph.D.
William D. McElroy, Ph.D., *Emeritus*
William J. McGinnis, Ph.D.
Stanley E. Mills, Ph.D., *Emeritus*
Maurice Montal, M.D., Ph.D.
John W. Newport, Ph.D.
Xuong Nguyen-Huu, Ph.D.
James W. Posakony, Ph.D.
Mu-Ming Poo, Ph.D.
Paul A. Price, Ph.D.
Milton H. Saier, Ph.D.
Paul D. Saltman, Ph.D., *Academic Senate Career Distinguished Teaching Award*
Immo Scheffler, Ph.D.
Terrence J. Sejnowski, Ph.D.
Allen I. Selverston, Ph.D.
S. Jonathan Singer, Ph.D., *Research Professor*
Douglas W. Smith, Ph.D.
Deborah H. Spector, Ph.D.
Nicholas C. Spitzer, Ph.D.
Herbert Stern, Ph.D., *Emeritus*
Kiyoteru Tokuyasu, Ph.D., *Emeritus*
Silvio S. Varon, M.D., *Research Professor*
Sandra L. Vehrencamp, Ph.D.
Jean Y. J. Wang, Ph.D.
Christopher J. Wills, Ph.D.
Flossie Wong-Staal, Ph.D.
David S. Woodruff, Ph.D.
Juan Yguerabide, Ph.D.
Charles G. Zuker, Ph.D.

Associate Professors

Willie C. Brown, Ph.D., *Emeritus*
Nigel M. Crawford, Ph.D.
P.A.G. Fortes, M.D., Ph.D.
Vivek Malhotra, Ph.D.
Cornelis Murre, Ph.D.
Muriel N. Nesbitt, Ph.D.
Ramon Piñon, Ph.D., *Emeritus*
Trevor D. Price, Ph.D.
Percy J. Russell, Ph.D., *Emeritus*
Robert J. Schmidt, Ph.D.
Julian I. Schroeder, Ph.D.
Michael P. Yaffe, Ph.D.
Martin F. Yanofsky, Ph.D.

Lecturer (LSOE)

Gabriele K. Wienhausen, Ph.D., *Academic Senate Distinguished Teaching Award*

Assistant Professors

Ethan Bier, Ph.D.
Randolph Y. Hampton, Ph.D.
Christine E. Holt, Ph.D.
Randall S. Johnson, Ph.D.
Joshua R. Kohn, Ph.D.
Kaustuv Roy, Ph.D.
William R. Schafer, Ph.D.

Adjunct Faculty

Suzanne Bourgeois, Ph.D.
Beverly Emerson, Ph.D.
Ronald M. Evans, Ph.D.
Meredith Gould, Ph.D.

Douglas R. Green, Ph.D.
Michael Gribskov, Ph.D.
Martin Haas, Ph.D.
Yasuo Hotta, Ph.D., *Research Biologist–Emeritus*
Anthony R. Hunter, Ph.D.
Kathy Jones, Ph.D.
Chris Kintner, Ph.D.
Norman R. Klinman, Ph.D.
Christopher J. Lamb, Ph.D.
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Marc R. Montiminy, M.D., Ph.D.
Dennis D.M. O'Leary, Ph.D.
Oliver A. Ryder, Ph.D.
Bartholomew M. Sefton, Ph.D.
Jonathan Sprent, Ph.D.
Ian S. Trowbridge, Ph.D.
Wylie W. Vale, Ph.D.
Inder Verma, Ph.D.
Geoffrey M. Wahl, Ph.D.
William O. Weigle, Ph.D.
David J. Western, Ph.D.

Major Programs in Biology

The UCSD Department of Biology is structured around the different levels of biological organization–biochemical, cellular, physiological, and ecological. The research and teaching of the department 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 Department of Biology 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 department offers six different major programs, each of which provides an excellent background for future graduate or professional study. They are (1) general biology, (2) animal physiology and neuroscience, (3) biochemistry and cell biology, (4) molecular biology, (5) microbiology, and (6) ecology, behavior, and evolution. 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 department'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 five colleges. For complete details regarding policies and procedures pertaining to the biology programs, please contact Biology Student Affairs.

Admission to the Majors

Any student who has been accepted to the University of California, San Diego is eligible for admission to one of the six biology majors. It is important that students try to begin fulfilling major requirements as soon as possible. Note that biology courses are in great demand and there may be enrollment limits on some courses. The Department of Biology has responded to this demand by offering certain critical courses several times a year. This solution only works if student enrollments are spread evenly over the offerings; waiting until spring quarter to finish a requirement that was offered in both the fall and winter quarters is not advisable as students may not be admitted to a crowded spring offering.

To officially declare one of the six biology majors, submit a completed Change of Major form to the Biology Student Affairs Office (1128 Pacific Hall) or at the Registrar's Office.

Department of Biology Residency Requirement

To receive a bachelor of science degree in biology from UCSD, **all students must complete at least nine upper-division biology courses (four-units each) in the Department of Biology while officially enrolled at UCSD.** (Students participating in the Education Abroad Program (EAP), UCSD Opportunites Abroad Program (OAP), courses at other UC campuses, and certain courses at other U.S. institutions 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.

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 Department of Biology's 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 and any additional upper-division UCSD Department of Biology courses taken. (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 six majors, must be taken for a letter grade with the exception of BISP 195, 196, or 199.**

Students with Transfer Credit

All courses (including prerequisites) taken at other institutions must be reviewed by the Department of Biology 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.

Submitting Petitions to the Department of Biology

There are many reasons you may feel the need to submit a petition. Regardless of the request, it is important that you seek the counsel of a biology undergraduate adviser in order that your petition can be reviewed for appropriateness and completeness. Petitions usually take a week to ten days to process through the Department of Biology. Some requests may

require additional time. After petitions are signed by the Department of Biology chair, they are forwarded to the academic advising office of the student's college for additional signatures. The student's copy can be obtained from that office. For details concerning petitions, please contact the Student Affairs Office (1128 Pacific Hall).

UCEAP Courses (Education Abroad Program)

It is very important that students who plan to participate in the U.C. 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 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

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 a T.A. should have received a strong grade in the course which they want to teach, have an overall GPA of 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 are available at the Biology Student Affairs Office.

BISP 199

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 Department of Biology. 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

Because the undergraduate research conducted through the Academic Internship Program is generally done at a site not affiliated with the UCSD Department of Biology, 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 or 199) can be used toward the major.

General Biology Major

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

This program allows the most diversified exposure to biology of any of the majors offered by the Department of Biology. 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 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. BILD 1, 2, and/or 3 (or equivalents) are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 1A, B, C or 20A, B, C
Chemistry 6A, B, C, **and** one lab
Physics 1A, B, C 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)
2. Either Structural Biochemistry (BIBC 100) or Metabolic Biochemistry (BIBC 102) is required. Both are recommended.
3. Genetics (BICD 100)
4. One upper-division biology lab to be chosen from the following: BIBC 103, BICD 101, 111, 123, 131, BIEB 121, 165, 167, 179, BIMM 101, 103, 121, BIPN 105, or 145. Independent Research (BISP 196, 199) is encouraged, but may not replace one of the formal laboratory courses listed above.
5. Nine additional upper-division courses (each course must be at least four units) taken through the UCSD Department of Biology are required. Only one quarter of BISP 195 and one quarter of either BISP 196 or 199 may be applied toward this requirement. (Subsequent quarters of 195, 196, 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.

Animal Physiology and Neuroscience Major

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology 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, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. BILD 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 1A, B, C, or 20A, B, C
Chemistry 6A, B, C, **and** one lab
Physics 1A, B, C 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 5 and 6 constitute the core of the animal physiology and neuroscience major. By choosing four optional four-unit upper-division biology courses (requirement 7), a program geared to the needs of the individual student can be formulated.

1. Organic Chemistry (Chemistry 140A, 140B, and 143A)
2. Either Structural Biochemistry (BIBC 100) or Metabolic Biochemistry (BIBC 102) is required. Both are recommended.
3. Molecular Biology (BIMM 100)
4. Genetics (BICD 100)
5. Four from the following six courses:
   a. Mammalian Physiology I (BIPN 100)
   b. Mammalian Physiology II (BIPN 102)
   c. Comparative Physiology (BIPN 106)
   d. Cellular Neurobiology (BIPN 140)
   e. Systems Neurobiology (BIPN 142)
   f. Developmental Neurobiology (BIPN 144)
6. One of three Physiology Laboratories (BIPN 105, BICD 131, or BIPN 145). BISP 196 or 199 or an AIP 197 may substitute for a laboratory upon approval by the faculty adviser.
7. Four additional upper-division courses (each course must be at least four units) taken through the UCSD Department of Biology are required and may include the above (number 5–6). These may include no more than one quarter of BISP 195 and one quarter of either BISP 196 or 199 (AIP 197 may be used in place of BISP 196 or 199 upon approval by the faculty adviser). (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.)

Biochemistry and Cell Biology Major

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology 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, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. BILD 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 1A, B, C, or 20A, B, C
Chemistry 6A, B, C, **and** one lab
Physics 1A, B, C or 2A, B, C, **and** one lab
(Mathematics 20A, B, C, and Physics 2A, B, C are recommended)

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140AB)
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. Molecular Biology (BIMM 100)
7. Cell Biology (BICD 110)
8. Genetics (BICD 100)
9. One upper-division biology lab to be chosen from the following: Eukaryotic Genetics (BICD 123), Cell Biology (BICD 111), Plant

Molecular Genetics and Biotechnology (BICD 123), Embryology (BICD 131), Recombinant DNA Techniques (BIMM 101), Advanced Techniques in Molecular Genetics (BIMM 103), Microbiology (BIMM 121), Animal Physiology Lab (BIPN 105), Neurobiology Lab (BIPN 145), or Organic Chemistry (Chemistry 143C). A BISP 199 research project may satisfy this upper-division lab requirement.

10. Five additional upper-division courses (each course must be at least four units) taken through the UCSD Department of Biology are required. Only one quarter of BISP 195 and one of BISP 196 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, or 199 may be applied toward college and university requirements.)

Molecular Biology Major

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology 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, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. BILD 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 20A, B, C
Chemistry 6A, B, C, **and** lab
Physics 1A, B, C **and** one lab or 2A, B, C, and one lab. The two sequence is recommended.

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A and B)
2. Organic Chemistry Laboratory (Chemistry 143A) or Physical Chemistry Laboratory (Chemistry 105A)
3. Genetics (BICD 100)
4. Structural Biochemistry (BIBC 100)
5. Metabolic Biochemistry (BIBC 102)
6. Molecular Biology (BIMM 100)
7. Cell Biology (BICD 110)
8. Microbial Genetics (BIMM 122)
9. Regulation of Gene Activity in Eukaryotic Cells (BIMM 112)
10. Biochemical Techniques (BIBC 103)
11. Recombinant DNA Techniques (BIMM 101).
12. Four additional upper-division courses (each course must be at least four units) taken through the UCSD Department of Biology are required. Attention is drawn to BICD 120, BICD 122, BICD 140, BIMM 110, and BIMM 114. Only one quarter of BISP 199 or 196 and one of BISP 195 may be used to fulfill this requirement. (Subsequent quarters of BISP 195, 196, or 199 may be applied toward college and university requirements.)

Microbiology Major

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology 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, 2, and 3 are not strictly required courses for any of the biology majors. However, it is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. BILD 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites.

Mathematics 1A, B, C, or 20A, B, C
Chemistry 6A, B, C, **and** one lab
Physics 1A, B, C, or 2A, B, C **and** one lab

Upper-Division Requirements

1. Organic Chemistry (Chemistry 140A-B)
2. Organic Chemistry Laboratory (Chemistry 143A)
3. Either Structural Biochemistry (BIBC 100) or Metabolic Biochemistry (BIBC 102) is required. Both are recommended.
4. Biochemical Techniques (BIBC 103)
5. Molecular Biology (BIMM 100)
6. Immunology (BICD 140)
7. Genetics (BICD 100)
8. Bacteriology (BIMM 120)
9. Laboratory in Microbiology (BIMM 121)
10. Virology (BIMM 114)
11. Medical Microbiology (BIMM 124)
12. Three additional upper-division courses (each course must be at least four units) taken through the UCSD Department of Biology are required. These may include no more than one quarter of BISP 195 and one quarter of BISP 196 or 199. (Subsequent quarters of 195, 196, 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)

Ecology, Behavior, and Evolution Major

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology 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 are not strictly required courses for any of the biology majors, but an understanding of BILD 3 is assumed in BIEB courses. It is STRONGLY RECOMMENDED that students complete at least two of these three courses in preparation for upper-division biology course work. BILD 1, 2, and/or 3 are prerequisites for many required upper-division biology courses, and enrollment preference may be given to students meeting these prerequisites. (NOTE: BILD 3 may be taken before BILD 1 if the student has an adequate advanced high-school biology background. It is preferred that BILD 3 be completed during the first year at UCSD.)

Mathematics: Three quarters of calculus are required. Mathematics 20A, 20B, and 20C are strongly recommended, but Mathematics 1A, 1B, and 1C are acceptable.

Chemistry: Chemistry 6A, 6B, and 6C. Laboratories in chemistry are not required.

Physics: Physics 1A, 1B, and 1C OR Physics 2A, 2B, and 2C. Laboratories in physics are not required.

Upper-Division Requirements

1. Genetics (BICD 100). This course should be taken at the end of the second year.
2. Biometry (BIEB 100). This course is a prerequisite for the laboratory courses in ecology, behavior, and conservation, and should be taken in the fall of the second or third year.
3. Either Structural Biochemistry (BIBC 100) or Metabolic Biochemistry (BIBC 102) is required. Please note that organic chemistry (Chemistry 140A and 140B) is a prerequisite for biochemistry. These prerequisite courses may be applied as elective courses under requirement number five listed below.
4. Ecology, Behavior, and Evolution. Seven courses to be chosen from BIEB 120–179 are required. At least two of these courses must be laboratory or field courses (BIEB 121, 165, 167, and/or 169). BIEB 120, 126, 130, 140, 150, 164, 166, and 178 are designed to be taken by third-year students; BIEB 121, 154, 156, 165, 167, 176, and 179 are designed to be taken by more advanced students. Laboratory courses may be taken either concurrently with the prerequisite lecture course *if Biometry (BIEB 100) has been taken,* or during the subsequent academic year. Note that some of the laboratory 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.
5. Four additional upper-division courses (each course must be at least four units) in biology, chemistry, mathematics, or related sciences are required. Courses to be completed outside of the UCSD Department of Biology **must be petitioned** (prior to commencement of the course) to satisfy this requirement. Transfer courses are considered to be outside of the department. Students participating in the Education Abroad Program should refer to the biology section of that topic or contact the undergraduate adviser. Courses outside the Department of Biology that are particularly appropriate and that have been approved in the past include: Chemistry 122, 140A-B, and 149A, Mathematics 111A-B-C, 180A-B-C, and 181A-B-C; Biological Anthropology (most courses); and Earth Sciences (most courses); Economics 131; Scripps Institute of Oceanography (consent of instructor required). Only one quarter of BISP 196 or 199 and one quarter of BISP 195 may be used to fulfill this requirement. (Subsequent quarters of 195, 196, or 199 may be applied toward college and university requirements.) Certain intensive spring and summer session courses offered at various universities and field stations throughout the country may be used to help satisfy this requirement if prior approval is obtained from the faculty adviser of the major by petition. A good example are the field courses in tropical biology offered in Costa Rica each spring and fall quarter. Prerequisites for the Costa Rica program are: BIEB 100, 120 and familiarity with Spanish; some type of field research experience, such as BIEB 121, 165 and/or 167, a field oriented BISP 199, or participation in a field research project, is strongly recommended. Biology courses taken through the Costa Rica program will be counted toward the major as one core course, one laboratory/field course, and one elective. These courses must be petitioned upon completion. Consult the Education Abroad Program Office at the UCSD International Center for details.

Honors Thesis in Biology

Students in any one of the six 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 Department of Biology *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 the honors thesis adviser. 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 Department of Biology 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 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 first quarter. 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. Entry into the third quarter will also require a report and interview of the student. 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.

Minor in Biology

To receive a minor from the Department of Biology, a student must complete at least six four-unit biology courses, including at least three four-unit upper-division biology courses (for a total of at least twenty-four units of course work). (The student's college grade policy is enforced.) Students may apply transferable biology courses from another institution toward the lower-division requirement, after obtaining approval from both the UCSD Department of Biology *and* the student's college. No courses taken outside of the Department of Biology 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 two of the three lower-division biology courses for the department. Students with AP credit must provide the Department of Biology with a copy of the AP score at the time the minor petition is submitted.

For more information regarding a minor in biology contact the Biology Student Affairs Office.

Secondary School Biology Teaching

UCSD's biology department 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 120, 150, BIPN 106, SIO 275B (or BILD 82). 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 Department of Biology at UCSD. Before the last quarter of their junior year (during the fourth quarter **prior** to the receipt of the B.S. degree), students interested in obtaining the M.S. degree within one year following receipt of the B.S. degree may apply to the department for admission to the program. (Contact the Department of Biology Student Affairs Office for precise residency requirements and application dates. Petitions for late (senior year) admission to the program are considered only when the candidate has established a record in academic research equivalent to that of students enrolled as juniors.)

The program is open only to UCSD undergraduates. The Department of Biology 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 a GPA of at least 3.0 in both the major and overall UC. It is the responsibility of the prospective B.S./M.S. student to select a faculty member (from the Department of Biology) 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 as described below. The twelve units of research (BGGN 271), 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 twelve units will count toward the requirements for the master's degree only and must be taken

for a S/U grade only. 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. The student will also arrange (with the adviser's guidance) 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, 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, will be cause for the student to be dropped from the program.

Application due dates are as follows:

Expected Date of Receipt of B.S.	**Application Due Date**
Fall 1997	November 1996
Winter 1998	January 1997
Spring 1998	August 1997

Students who have been approved (by both the Department of Biology **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. During the eighth week of the quarter in which BGGN 271 will be taken, the student needs to pick up an Add/Drop card at Biology Student Affairs Office (1128 Pacific Hall). At that time, the student's GPA will be verified and the appropriate course code assigned.

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 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 senior undergraduate year and the graduate year. The course of study must be approved by the faculty adviser and must include the following:
   a. Completion of four units of research (BGGN 271) during each of the final three quarters of the senior year. NOTE: It is mandatory that students complete three complete, separate, and consecutive academic quarters (with four units of research [BGGN 271] during each of the final three quarters), TO COMMENCE THE QUARTER IMMEDIATELY FOLLOWING THE QUARTER IN WHICH THE STUDENT HAS RECEIVED OFFICIAL ACCEPTANCE INTO THE PROGRAM and prior to the receipt of the B.S. degree.
   b. Completion of at least four units of research (BGGN 271) during each of the three quarters of the subsequent graduate year.
   c. Completion of four units of teaching (BGGN 500) during the graduate year.
   d. Completion of at least eight additional units of graduate-level course work in biology or related disciplines, approved by faculty adviser. (BGGN 297 MAY NOT be used to satisfy this requirement. B.S./M.S. students may not enroll in BGGN 297, but may audit with consent of the instructor.)
2. 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.
3. Completion of a thesis, with an oral presentation to, and approval of, a three-member committee from the Department of Biology (the faculty adviser and two other faculty members).
4. 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.)
5. 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. Also, students are expected to contact the biology graduate coordinator prior to each quarter of the graduate year to verify that appropriate forms have been completed. The completed Application for Candidacy for the Thesis is to be submitted to the biology graduate coordinator during the quarter preceding the final quarter of the graduate year. Students must pay fees and be officially enrolled at UCSD during the quarter that the master's degree is to be awarded. Students must *personally* hand carry all of the necessary official graduation paperwork to the various campus offices. Friends/relatives are not allowed to do this. The thesis draft should be submitted to the Office of Graduate Studies and Research for review before the final copy is officially submitted.

Non-Degree Program

The Department of Biology 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 minimum.

Students who wish to apply to the UCSD biology 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 Department of Biology in association 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 Department of Biology 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 department. 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. The only other general course requirement for the Ph.D. is 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 Department of Biology 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 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 Clinic and Research Foundation, and with the Salk Institute for Biological Studies.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed seven years.

Joint Doctoral Program with San Diego State University

The Department of Biology 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. Applicants to the UCSD Department of Biology graduate program who check the square marked "joint doctoral program" as well as the one marked "doctorate" will be considered for admission to both programs.

COURSES

NOTE: The department 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 department's Student Affairs Office (1128 Pacific Hall, (619) 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 1996–97 only. It should not be assumed that the same schedule will continue after this academic year.

Prerequisites are enforced when adding all lab courses. Students who have satisfied the prerequisites for labs at another college or by AP credit need to be pre-authorized to T-Reg the lab. Please come to the Biology Student Affairs Office before your T-Reg time to be authorized. If the class is full on T-Reg please place your name on the waitlist via T-Reg 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 DEPARTMENT 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. *Prerequisite: BILD 1.* (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: a full year of high school biology or BILD 1.* **NOTE: E.B.E. majors should complete this course during their first year at UCSD.** (F,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. (Students may not receive credit for BILD 10 after receiving credit for BILD 1.) (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-divison requirement for any biology major. *Prerequisite: BILD 1, 2, 3, 10, 24, 26, 30, 32, or any equivalent.* (W)

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. (W)

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. *Prerequisite: BILD 1, 10, or equivalent.* (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 having completed 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. *Prerequisite: BILD 10.* (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. *Prerequisite: BILD 10 or equivalent.* (W)

BILD 30. Biomedicine/Microbes (4)
General principles of microbiology with emphasis on the cell biology of microorganisms and of the cells with which they interact in causing diseases of man and animals. A discussion of infection by bacteria fungi and viruses, and host responses to infection. 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 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. (S)

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. (F)

BILD 60. Classic Experiments in Modern Biology (2)
Experiments from outstanding research papers and fundamental procedures in areas of modern biology, including biochemistry, cell and molecular biology, and cellular differentiation, will be discussed in lecture. Students will be expected to read a text and journal articles related to lecture. Two hours of lecture. **This course will not satisfy any requirements for the biology major, biology minor, or college general-education purposes.** *Prerequisite: BILD 1.* (Not offered in 1996–97.)

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.** (F,W,S)

BILD 95. Undergraduate Workshops (1)
The workshops will be restricted to lower-division undergraduentific 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. (F,W,S)

BILD 99. Horticulture and Animal Husbandry (4)
The practical and theoretical aspects of plant and animal propagation, maintenance, and behavior in a typical Southern California farm community. Animals to be studied include bees, rabbits, sheep, goats, pigs, horses, chickens, ducks, geese, and turkeys. Behavioral and social aspects are emphasized. Plants to be studied include a variety of fruit trees, bushes, and vegetables. Emphasis is on propagation and culture conditions. Each student chooses a principal project and area of study. One hour of lecture and fourteen hours of farm work, research and/or study per week. Oral reports and final paper required. (S)

UPPER-DIVISION

Biochemistry

BIBC 100. Structural Biochemistry (4)
The structure and function of biomolecules. Includes proteins conformation, dynamics, and function; enzymatic catalysis 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. Three hours' lecture and one hour recitation. *Prerequisites: two quarters of organic chemistry (second quarter may be taken concurrently). BIBC 100 is strongly recommended, but not required.* (Note: Students may not receive credit for both BIBC 102 and Chem. 114B.) (F,W,S)

BIBC 103. Biochemical Techniques (6)
A laboratory-lecture course in the application of biochemical methods to biological problems. Three 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. *Prerequisite: BIBC 100 or 102 (may be taken concurrently).* (NOTE: Students may not receive credit for both BIBC 103 and Chem. 112A.) (F,W,S) 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 at the Registrar's Office.

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 FORTRAN 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. *Prerequisites: Math. 2A, B, C.* (NOTE: Students may not receive credit for both BIBC 115 and Chem. 134.) (F)

BIBC 116. Protein Evolution (4)
Protein structure and function. Topics include: the domain structure of proteins and the evolution of new protein activities; proteases and the regulation of biological processes such as blood coagulation; extracellular matrix proteins, including collagens, elastin, proteoglycans, fibronectin, and laminin; antibodies and the immunoglobulin superfamily; hormones and the mechanisms of hormone action. Continuation of Biochemistry 1. *Prerequisite: BIBC 102.* (Not offered in 1996–97.)

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 100 or 102.* (F,S)

BIBC 130. Marine Biochemistry (4)
This course examines the adaptations of marine animals on different and changing environments. The effects of deep-sea pressures, water temperature, availability of oxygen, salinity, and hydrothermal vent environments are discussed. Three hours of lecture and one hour of discussion. *Prerequisite: BIBC 100 or 102 or Chem. 114B or consent of instructor.* (F)

BIBC 153. Topics in Biophysics/Photobiology (4)
(Same as Chemistry 153 and Physics 153.)
Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. *Prerequisite: upper-division standing in biology, chemistry or physics, or consent of instructor.* (S)

BIBC 180. Topics in Biochemistry (4)
An advanced course which covers in depth a specialized topic in biochemistry. Three hours of lecture. *Prerequisite: BIBC 100 or 102.* (Not offered in 1996–97.)

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 (may not be taken concurrently).* (Not offered in 1996–97.) 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 at the Registrar's Office.

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: BILD 1, BIBC 100, and BICD 100.* (F,W,S)

BICD 111. Cell Biology Laboratory (4)
A laboratory course in the application of cellular techniques to biological problems. Ten hours of laboratory. *Prerequisites: consent of instructor and 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 at the Registrar's Office.

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 genetics engineering, plant disease and stress, medicinal plants, plants and the environment, and sustainable agriculture. *Prerequisites: BILD 1 and 2.* (F)

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. *Prerequisites: BIBC 102 required, BICD 120 recommended.* (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: BIBC 103 and BICD 120 strongly recommended.* (S) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped form the course roster. It is the student's responsibility to officially drop the course at the Registrar's Office.

BICD 130. Embryology (4)
Explores the biology of early animal development at the tissue, cellular, and molecular levels. Basic processes of embryogenesis in a variety of organisms are considered, with emphasis on vertebrate/mammalian development. Aims at a clear understanding of fundamental principles of developmental biology. Three hours of lecture and one hour of recitation. *Prerequisite: BILD 1.* (W)

BICD 131. Embryology Laboratory (6)
Descriptive and experimental embryology of marine organisms 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: upper-division standing, BILD 1 and 2 or BIPN 100 or the equivalent, and consent of the instructor. BICD 110 and/or BICD 130 recommended.* (F,S) 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.

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. *Prerequisite: BIMM 100.* (Not offered in 1996–97.)

BICD 134. Human Reproduction and Development (4)
This course is addressed to the development of the human sexual system, including gametogenesis, fertilization, 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: BIBC 100 or BIBC 102, and BICD 100.* (F)

BICD 140. Immunology (4)
This course covers both cellular and humoral aspects of the immune response. Topics include antibody structure, function, and gene regulation, T cell regulation of antibody production, T cell responses including transplantation reactions, antigen recognition, antigen presentation, immune dysfunctions leading to disease, and immune tolerance. Three hours of lecture. *Prerequisites: BIBC 100 or BIBC 102, BIMM 100, upper-division standing.* (F)

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.* (Not offered in 1996–97.)

BICD 150. Endocrinology (4)
Topics are hormone biosynthesis, metabolism and mechanisms of action, neuroendocrinology, regulation of intermediary metabolism and body size, water and electrolyte, calcium and phosphate homeostasis. This course is restricted to upper-division students. Three hours of lecture and one hour of discussion. *Prerequisite: BIBC 102 (may be taken concurrently).* (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. *Prerequisite: BICD 100 (may not be taken concurrently);* BIMM 100 is strongly recommended. (F)

Ecology, Behavior, and Evolution

BIEB 100. Biometry (4)
This course provides an introduction to the use of statistics in biological problems. Topics include parametric statistics (t-tests, correlation, regression, ANOVA), non-parametric statistics, and experimental design. Students are introduced to statistical software on the Macintosh computer. Three hours of lecture and two hours of section. *Prerequisite: BILD 3.* (F,W)

BIEB 120. General Ecology (4)
A study of the factors affecting species' distributions and abundances, with a special emphasis on population dynamics. Three hours of lecture and one hour of section. *Prerequisite: BIEB 100 (may be taken concurrently).* (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 and 120 (may be taken concurrently).* (F,W,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.* (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.* (F)

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 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.* (F)

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.* (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 recommended.* (F)

BIEB 164. Sociobiology (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.* (F)

BIEB 165. Sociobiology 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.* (F)

BIEB 166. Animal Communication (4)
An integrated approach to animal communication, including the physics and physiology of signals, optimal strategies for signalling and receiving, and the ecological and social contexts of signal evolution. Three hours of lecture and one hour of section. *Prerequisite: BILD 3.* (W)

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.)* (W)

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: BILD 3 or consent of instructor.* (S)

BIEB 178. Principles of Conservation Biology (4)
Modern conservation biology integrates three levels of population biology knowledge—population genetics, population dynamics, and community ecology—to provide management guidance for the preservation of endangered species. This course introduces the subject in the context of case studies. Three hours of lecture and two hours of discussion. *Prerequisites: BIEB 100 and (BIEB 120 or BIEB 156).* (S)

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, (may be taken concurrently).* (S)

Molecular Biology, Microbiology

BIMM 100. Molecular Biology (4)
Molecular analysis of gene action: DNA structure, replication, transcription, protein synthesis. Regulation of gene activity. Recombination, mutation, and introduction to genetic engineering. Emphasis on procaryotes, but with discussion of eucaryotes. Three hours of lecture and one hour of recitation. *Prerequisites: BIBC 100 or 102 and 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. *Prerequisites: BIMM 122 and consent of instructor.* (S) 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 at the Registrar's Office.

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. *Prerequisite: BIBC 103.* (W) 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 at the Registrar's Office.

BIMM 110. Molecular Basis of 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: BIMM 100 and BICD 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.* (W)

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)

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 and consent of instructor.* (W) 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.

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, and 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; recommended: BICD 140.* (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 and BIMM 120.* (Summer Session only)

BIMM 132. 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. *Prerequisite: BIMM 100 or equivalent.* (S)

BIMM 140. Computer Analysis of Genome Information (4)
Lecture and lab are three hours. Information on genome projects via computer analysis of genome information, emphasizing DNA, RNA, and protein sequence analysis. Use of DNASYSTEM and GCG programs and databases on VAX computers; analysis of program algorithms and statistical criteria. *Prerequisites: BIBC 100 or 102, BIMM 100, and BICD 100. (BIMM 100 may be taken concurrently.)* (W)

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, 2, and BIBC 100 or 102.* (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 then 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: BIPN 100.* (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. *Prerequisites: BILD 1, 2, and BIBC 100 or 102. BIPN 100, 102, or 106 may be taken concurrently.* (Students who have received credit for Biol. 152 or 154 may not receive credit for BIPN 105.) 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. (W,S) 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 at the Registrar's Office.

BIPN 106. Comparative Physiology (4)
Adaptation and evolution of the structure and function of physiological systems of animals. Three hours of lecture and one hour of section. *Prerequisites: BILD 1, 2 (BILD 3 recommended), and Chem. 6A-B-C.* (W)

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, and BIBC 100 or 102.* (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)
We will examine the 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.* (S)

BIPN 145. Neurobiology Laboratory (6)
Current electrophysiological techniques used to study nervous systems are taught through exercises and individual projects. One hour of lecture and nine hours of laboratory each week. In addition to the formal lab hours, there will be at least eleven hours in which students will be required to work in the class laboratory to complete experiments and prepare for presentations. *Prerequisite: BIPN 140, 142, or 144 (may be taken concurrently).* (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 at the Registrar's Office.

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.* (S)

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 Biology 195 are to be submitted to, and approved by, the Department of Biology prior to the eighth 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.**

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 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 department chair.* (NOTE: Applications for a BISP 199 must be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the Biology 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. (W)

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.) (Not offered in 1996–97)

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 214. Workshop in Behavioral Ecology (3)
Hands-on experience in the analysis, modeling, and testing of hypothesis in behavioral ecology. Weekly group discussions and out-of-class projects will focus on a different theme (e.g., sexual selection, quantitative genetics, game theory, etc.) each year. *Prerequisite: open to qualified undergraduates and graduate students with consent of instructor.* (S/U grades only.) (Quarter offered varies and course is not offered every year.)

BGGN 220. Advanced 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. Advanced Protein Biochemistry (3)
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. Advanced 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. Advanced 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. Advanced Neurobiology (3)
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.) (W)

BGGN 225. Advanced Immunology (3)
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.) (W)

BGGN 226. Advanced Animal Virology (3)
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. Advanced Topics in Plant Biology (3)
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.) (S)

BGGN 228. Advanced Developmental Biology (3)
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. Advanced Oncogenes (3)
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 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. Molecular 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 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. Systems Neurophysiology (3)
Ways in which neurons are assembled into circuits to achieve perception and patterned movement. (S/U grades only.) (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) (Not offered in 1996–97.)

BGGN 255. Clinical Correlates (2)
Clinical correlates stresss the close ties between clinical medicine and basic science and the two-way interactions among practicing doctors and research scientists. Most sessions start with the presentation of a clinical case by an attending practitioner and an analysis by the clinician of the basic principles demonstrated by each case. There will follow an extended period of open discussion between basic scientists, clinicians, and students. *Prerequisites: graduate students only, BGGN 251, 252, 253, 254 to be taken simultaneously.* (S/U grades only.) This course is cross-listed with Chemistry 277. (F)

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 department chair.* (letter grades only.) (F,W,S) (NOTE: Applications for a BGGN 271 are to be submitted to, and approved by, the Department of Biology prior to the eighth week of the quarter preceding the quarter in which the BGGN 271 will be completed. No BGGN 271 application form will be accepted after that date.)

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)
(Letter grades only) (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)

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. Undergraduates 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. Undergraduates 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. Undergraduates 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. Undergraduates 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. Undergraduates 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. Undergraduates 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. Undergraduates 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. Undergraduates 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. Undergraduates must be seniors or enrolled in BISP 199.* (S/U grades only.)

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)

Biomedical Sciences

OFFICE: 5008 Basic Science Building, School of Medicine

Professors

Roland C. Blantz, M.D., *Medicine*
Colin M. Bloor, M.D., *Pathology*
Gerry R. Boss, M.D., *Medicine*
Robert A. Brace, Ph.D., *Reproductive Medicine*
Joan Heller Brown, Ph.D., *Pharmacology*
Dennis A. Carson, M.D., *Medicine*
Webster K. Cavenee, Ph.D., *Medicine*
Pojen Chen, Ph.D., *Medicine (In-Residence)*
Kenneth R. Chien, M.D., Ph.D., *Medicine*
Shu Chien, M.D., Ph.D., *Bioengineering and Medicine*
Don Cleveland, Ph.D., *Medicine*
James W. Covell, M.D., *Medicine and Bioengineering*
Edward Dennis, Ph.D., *Chemistry*
Wolfgang H. Dillmann, M.D., *Medicine*
Mark H. Ellisman, Ph.D., *Neurosciences*
Scott Emr, Ph.D., *Medicine*
Gregory F. Erickson, Ph.D., *Reproductive Medicine*
Ronald M. Evans, Ph.D., *Adjunct/Mathematics*
Darrell D. Fanestil, M.D., *Medicine*
Marilyn Farquhar, Ph.D., *Pathology*
James R. Feramisco, Ph.D., *Pharmacology and Medicine*
Theodore Friedmann, M.D., *Pediatrics*
Gordon N. Gill, M.D., *Medicine*
Lawrence S. B. Goldstein, Ph.D., *Pharmacology*
Philip Groves, Ph.D., *Psychiatry*
A. F. Hofmann, M.D., Ph.D., *Medicine (Emeritus)*
Stephen B. Howell, M.D., *Medicine*
Paul A. Insel, M.D., *Pharmacology*
Martin F. Kagnoff, M.D., *Medicine*
Michael Karin, Ph.D., *Pharmacology*
Thomas J. Kipps, M.D., Ph.D., *Medicine*
Ronald Kuczenski, Ph.D., *Psychiatry (In-Residence)*
Hyam L. Leffert, M.D., *Pharmacology*
Richard Lieber, Ph.D., *Orthopedics*
Carol MacLeod, Ph.D., *Medicine*
James Andrew McCammon, Ph.D., *Pharmacology/Chemistry/Biochemistry*
Odile Mathieu-Costello, Ph.D., *Medicine (In-Residence)*
Pamela Mellon, Ph.D., *Medicine*
Daniel T. O'Connor, M.D., *Medicine (In-Residence)*
Jerrold M. Olefsky, M.D., *Medicine*
George Palade, Ph.D., *Medicine*
Morton P. Printz, Ph.D., *Pharmacology*
Douglas D. Richman, M.D., *Medicine/Pathology (In-Residence)*
Michael Rosenfeld, M.D., *Medicine*
Geert Schmid-Schoenbein, Ph.D., *Bioengineering*
David S. Segal, Ph.D., *Psychiatry*
Stephen A. Spector, M.D., *Pediatrics*
Daniel Steinberg, M.D., Ph.D., *Medicine*

Charles F. Stevens, Ph.D., *Adjunct/ Pharmacology*
Palmer W. Taylor, Ph.D., *Pharmacology*
Roger Y. Tsien, Ph.D., *Pharmacology*
Robert H. Tukey, Ph.D., *Medicine and Pharmacology*
Wylie W. Vale, Ph.D., *Adjunct/Medicine*
Ajit P. Varki, M.D., *Medicine*
Peter D. Wagner, M.D., *Medicine*
John F. Ward, Ph.D., *Radiology (Emeritus)*
Stephen I. Wasserman, M.D., *Medicine*
John B. West, M.D., Ph.D., *Medicine and Physiology*
Joseph Witzum, M.D., *Medicine*
Flossie Wong-Staal, Ph.D., *Medicine and Biology*
Tony L. Yaksh, Ph.D., *Anesthesiology and Pharmacology*
Maurizio Zanetti, M.D., *Medicine (In-Residence)*

Associate Professors

Kim E. Barrett, Ph.D., *Medicine (In-Residence)*
Sue Bodine-Fowler, Ph.D., *Orthopedics (In-Residence)*
Laurence L. Brunton, Ph.D., *Medicine/ Pharmacology*
Mario Chojkier, M.D., *Medicine*
Christopher Glass, M.D., Ph.D., *Medicine*
Connie Holm, Ph.D., *Medicine (In-Residence)*
Vivian Hook, Ph.D., *Adjunct/ Medicine*
Carolyn J. Kelly, M.D., *Medicine-Nephrology (In-Residence)*
John C. Khoo, Ph.D., *Adjunct Professor, Medicine*
Diana L. Marquardt, M.D., *Medicine (In-Residence)*
James D. Marth, Ph.D., *Medicine*
Alexandra Newton, Ph.D., *Pharmacology*
Frank L. Powell, Ph.D., *Medicine*
Alexis Traynor-Kaplan, Ph.D., *Adjunct/Medicine*
Virgil L. Woods, Jr., M.D., *Medicine*

Assistant Professors

Tristram Bahnson, *Assistant Adjunct Professor, Medicine/Pharmacology*
Jerold J. M. Chun, M.D., Ph.D., *Pharmacology*
Xiang-Dong Fu, Ph.D., *Medicine*
Elizabeth A. Komives, Ph.D., *Chemistry*
Fred Levine, M.D., Ph.D., *Pediatrics/ Molecular Genetics (In-Residence)*
Oswald Quehenberger, Ph.D., *Assistant Adjunct Professor, Medicine*
Veronica Roberts, Ph.D., *Assistant Professor, Reproductive Medicine*
Francisco Villarreal, M.D., Ph.D., *Assistant Adjunct Professor, Medicine*
Nicholas J. G. Webster, Ph.D., *Medicine (In-Residence)*

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, the Cancer Center, and the Division of Cellular and Molecular Medicine. 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 membrance 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, 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 a pertinent research prob-

lem 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 between the spring of the third year and the beginning of the fourth 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

206. Organ Physiology (9)
Building on the student's basic knowledge of cellular biology and biochemistry, this course develops fundamental concepts of organ physiology. Major areas include autonomic, cardiovascular, gastrointestinal, renal, and respiratory physiology. Clinical correlation sessions relate physiological principles to clinical situations. *Prerequisites: BMS 210, 211, 212, 213 or equivalent background in biology and chemistry. For students not in the School of Medicine, consent of instructor.* (W)

206L. Organ Physiology and Pharmacology, Laboratory Course (3)
Selected laboratory exercises demonstrating basic principles of pharmacology and organ physiology. Subjects covered include electrocardiography, hemodynamics, myocardial control mechanisms, pulmonary function, dose-response relationships in pharmacology, autonomic mechanisms, and other aspects of physiology and pharmacology. *Prerequisites: cell biology and biochemistry or equivalent, and consent of instructor.* (W)

208A-B. Topics in Medical Therapeutics (1-2)
Students attend pharmacology (medical therapeutics) lectures given in conjunction with those presented in core courses. Correlation with pathophysiology of diseases will be stressed including organ malfunction as causes of drug toxicity. Other topics will include chemotherapeutic agents and cardiovascular drugs. (W,S)

210. Cellular Biology (6)
The course focuses on fundamentals of the biology of eukaryotic cells. Topics include: Cell structure and cytoskeleton, biosynthesis of macromolecules, transport across cell membranes, receptors and signal transduction, regulation of the cell growth cycle, early development and differentiation. (F)

211. Molecular Biology (6)
The course covers concepts and techniques of molecular biology. Topics include: DNA and chromosome structuring, the eukaryotic genome, gene transcription units and their regulation, RNA processing, RNA and DNA viruses, development and methodologies of molecular biology. (W)

212. Cellular and Molecular Pharmacology (6)
Topics include: Analysis of ligand-macromolecule interactions, biochemistry and pharmacology of chemical transmission and signal transduction, cellular responses to environmental stress (cyto P-450, P-glycoprotein, etc.), and bases of selective toxicity (viruses, bacteria, insects, mammalian tumor cells). Emphasis is on basic principles, on analysis of recent experimental data, and on integration in mammalian systems. (W)

213. Systemic Physiology (6)
General principles of organ physiology including mass transport, tissue and fluid mechanics, membrane transport, energetics, structure-function relations, and homeostasis applied to cardiovascular, gastrointestinal, muscle, renal, and respiratory systems. Emphasis on integrative properties of cells in organs and organismic responses. (F)

220A-B. Principles of Pharmacology (2-3)
Building on the student's knowledge in cell biology and biochemistry, this course examines the principles of pharmacology and therapeutics and relates them to clinical practice. The portion of the course given in the winter quarter is closely integrated with the organ physiology course. *Prerequisites: same as 206.* (W,S)

222. Molecular Glycobiology (2)
Molecular Glycobiology encompasses studies of the structure, biosynthesis, and biological roles of oligosaccharide units on glycoconjugates. The course will provide an overview of this rapidly evolving field with an emphasis on the glycoconjugates of eukaryotic organisms in the animal kingdom. (S)

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)

225. Physiological Aspects of the Ovary (3)
This course deals with recent concepts concerning structure-function relationships in the mammalian ovaries. Contents include: history, development, cytology, steroid biosynthesis and function, hormone receptor interactions, oogenesis, folliculogenesis, ovulation, corpus luteum formation/regression, menstrual cycle, menopause, pathophysiology. (W)

226. Frontiers in Endocrinology and Metabolism (3)
The course covers recent advances of research in lipid, lipoprotein metabolism, carbohydrate metabolism, reproductive medicine, diabetes mellitus, and atherosclerosis. (F)

227. Neuroendocrinology (4)
This course will examine the role of the CNS in controlling reproductive functions, stress, growth, biological rhythm, and behavior. Materials to be covered include: the evolution of neuroendocrine hormones; development and maturation of the neuroendocrine system; neuroendocrine techniques; neuroanatomy; physiological actions of neuropeptides; the nature of aminergic and peptidergic neurotransmission in the brain in modulating the output of hormones of the pituitary; cellular and molecular mechanisms of neuroendocrine function. (S)

228. Basic Science Research Seminar (1)
The objective is to provide an opportunity for cardiology research fellows, postgraduate students and undergraduate students to intereact with faculty in the Division of Cardiology in a faculty-sponsored basic research seminar. This will take place once a month for ten sessions at a faculty member's home. It will be in the format of a journal club where a faculty member or a faculty-sponsored individual will present and discuss one recent article deemed to have considerable scientific importance. The content of the course will be determined by the faculty member who is assigned the session. *Prerequisite: bachelor's degree in a science discipline.* (F,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)

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 Biology, BIMM 100, BICD 100, BIBC 100, BIBC 102.*

236. Maternal and Placental Physiology (2)
This course provides a broad based coverage of the physiology of maternal changes during pregnancy as well as physiology of the placenta. Included are endocrine, cardiovascular, respiratory, fluid balance, metabolism, nutrition, lactation, immune and postpartum aspects as well as problems of pregnancy. *Prerequisites: Med. 206 (OPP) and Med. 209 (ERM), or equivalent.* (F)

237. Fetal Physiology (2)
This course provides a broad based coverage of the physiology of the fetus, including growth and development, metabolism, neurologic and endocrine development, regulation of the cardiovascular, endocrine, renal, and gastrointestinal systems, development of the lungs, immune system, abnormal development genetic problems, and diseases. *Prerequisites: same as 236.* (W)

239. Practical Design and Evaluation of Biomedical Research (2)
Strategy, tactics, and critical analysis of biomedical research including 1) how to evaluate whether an idea for an experiment is worth pursuing, 2) fundamentals of experimental design, 3) experimental analysis, and most importantly, 4) how to read and critically evaluate biomedical research reports. *Prerequisite: SOM 203, equivalent, or consent of instructor.* (W)

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.

241. Neuroreflex Control of Cardiovascular and Respiratory Systems (3)
Topics covered in this course include experimental techniques, CNS respiratory and cardiovascular mechanisms, reflex modulation of breathing, arterial, visceral and somatic cardiovascular reflexes, pathophysiology, cardiorespiratory interactions, control systems theory. The course emphasizes the experimental basis of our knowledge and general principles applicable to other physiological systems. (S)

244. Development of Ideas in Physiology and Pharmacology (2)
Course will cover aspects of the development of ideas in physiology and pharmacology. (W)

262. Neurophysiology (4)
An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. (W)

271. 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 BE 231A, or consent of instructor.*

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

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

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

B.S. in physics with specialization in biophysics-premedical

C.Phil. in physics (biophysics)

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.

See "Physics" for more information.

The Undergraduate Program

Physics Major with Specialization in Biophysics

The upper-division program for physics majors with specialization in biophysics is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for advanced work in biophysics. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent re-arrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics.

a. 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-CL.
3. BILD 1.*
4. Mathematics 20C, 20D, 20E, 20F, or 21C, 21D, 20E, 20F.†

†Effective fall 1994, the Department of Mathematics replaced the Math 2 sequence with a new Math 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

b. Upper-division:

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153.
2. Chemistry 127 or 131, 140A-B, 143A.
3. BIBC 100, BIBC 103, BIMM 100, BICD 110, BICD 100.*
4. Mathematics 110.

c. Suggested schedule is:

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 120A	Phys. 120B
Phys. 110A	Chem. 140B	Phys. 130A
Chem. 140A		Chem. 143A
SENIOR YEAR		
Phys. 130B	BIBC 103	Phys. 153
BIBC 100	Chem. 127	BIMM 100
BICD 100		BICD 110

*The Department of Biology renumbered all biology courses effective fall quarter 1993. See "Biology" for conversion of old course numbers to new course numbers.

Physics Major with Specialization in Biophysics-Premedical

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the

program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent arrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics-premedical:

a. 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 Chemistry 6BL-CL.
3. BILD 1.*
4. Mathematics 20C, 20D, 20E, 20F, or 21C, 21D, 20E, 20F.†

† Effective fall 1994, the Department of Mathematics replaced the Math 2 sequence with a new Math 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

b. Upper-division:

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153.
2. Chemistry 127 or 131, 140A-B, 143A.
3. BIBC 100, BIMM 100, BICD 110, BICD 100.*
4. Mathematics 110.
5. Restricted elective: one biology course (BICD 130, BICD 134, or BIMM 112).*

*The Department of Biology renumbered all biology courses effective fall quarter 1993. See "Biology" for conversion of old course numbers to new course numbers.

c. Suggested schedule:

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 120A	Phys. 120B
Phys. 110A	Chem. 140B	Phys. 130A
Chem. 140A	Math. 110	Chem. 143A
SENIOR YEAR		
BIBC 100	Chem. 127	Phys. 153
BICD 100	Restr. Elec.	BICD 110
		BIMM 100

The Graduate Program

Research in biophysics is being actively pursued in several departments (e.g., physics, chemistry, biology), which also offer courses in or relevant to biophysics.

Graduate students specializing in the area of biophysics within the Department of Physics receive the Ph.D. 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 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, an oral topic examination, a qualifying examination, 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.

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. Oral Topic Examination

Biophysics students are required to take an oral topic examination no later than the spring of the third year of graduate work. Three topics of current interest in physics or biophysics are announced two weeks prior to the examination week, and a list of relevant references is supplied. Students select one of the topics and present a 30–45 minutes talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour of ques-

tioning generally related to the topic. This examination is offered twice a year, at the beginning of the fall and spring quarters, and may be repeated once, the next time it is offered.

4. 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.

5. Instruction in Physics Teaching

All graduate students are required to participate in "Instruction in Physics Teaching" under the supervision of a professor as part of their training for future careers. Students will participate in teaching recitation sections, problem sessions, or laboratory sections. Students are required to take a total of two units of Physics 500.

6. 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
(619) 534-3575

Undergraduate Student Programs,
4010 York Hall
(619) 534-4856
Graduate Student Programs,
4010 York Hall
(619) 534-6870
Revelle College

Professors

William S. Allison, Ph.D.
James R. Arnold, Ph.D., *Professor Emeritus*
Marjorie C. Caserio, Ph.D., *Professor Emeritus*
Leigh B. Clark, Ph.D., *Professor Emeritus*
Edward A. Dennis, Ph.D.
Daniel J. Donoghue, Ph.D.
Russell F. Doolittle, Ph.D., *Professor Emeritus*
Robert C. Fahey, Ph.D., *Professor Emeritus*
Murray Goodman, Ph.D.
Elvin Harper, Ph.D., *Professor Emeritus*
David N. Hendrickson, Ph.D.
Martin D. Kamen, Ph.D., *Professor Emeritus*
David R. Kearns, Ph.D., *Professor Emeritus*
Joseph Kraut, Ph.D., *Professor Emeritus*
Jack Kyte, Ph.D.
Katja Lindenberg, Ph.D.
Douglas Magde, Ph.D.
Kurt Marti, Ph.D.
J. Andrew McCammon, Ph.D.
Trevor C. McMorris, Ph.D.
Stanley L. Miller, Ph.D., *Professor Emeritus*
W. E. Moerner, Ph.D.
Xuong Nguyen-Huu, Ph.D.
K.C. Nicolaou, Ph.D.
Hans Oesterreicher, Ph.D.
Charles L. Perrin, Ph.D., *Academic Senate Distinguished Teaching Award*
Gerhard N. Schrauzer, Ph.D., *Professor Emeritus*
Kurt E. Shuler, Ph.D., *Professor Emeritus*
John D. Simon, Ph.D.
Susan Taylor, Ph.D.
Mark Thiemens, Ph.D., *Chair*
William C. Trogler, Ph.D.
Roger Y. Tsien, Ph.D.
Regitze R. Vold, Ph.D.
Joseph W. Watson, Ph.D., *Vice Chancellor, Student Affairs*
John H. Weare, Ph.D.
Ernest Wenkert, Ph.D., *Professor Emeritus*
John C. Wheeler, Ph.D.
Kent R. Wilson, Ph.D.
Bruno H. Zimm, Ph.D., *Professor Emeritus*

Associate Professors

F. Thomas Bond, Ph.D., *Provost, Revelle College*
John E. Crowell, Ph.D.
Daniel F. Harvey, Ph.D.
Andrew C. Kummel, Ph.D.
Joseph O'Connor, Ph.D.
Michael J. Sailor, Ph.D.
Jay Siegel, Ph.D.

Lecturer (LSOE)

Barbara A. Sawrey, Ph.D.

Assistant Professors

Robert E. Continetti, Ph.D.
Gourisankar Ghosh, Ph.D.
Patricia A. Jennings, Ph.D.
Timothy B. Karpishin, Ph.D.
Elizabeth A. Komives, Ph.D.
Amitabha Sinha, Ph.D.
Emmanuel A. Theodorakis, Ph.D.
Yitzhak Tor, Ph.D.

Adjunct Professors

Leslie E. Orgel, Ph.D.
Peter R. Taylor, Ph.D.

Assistant Adjunct Professors

Seunghyon Choe, Ph.D.
Joseph 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

Chemistry

B.A. Environmental Chemistry
B.S. Chemistry
B.S. Chemical Physics
B.S. Chemistry/Earth Sciences
B.S. Chemical Education
B.S. Pharmacological Chemistry
M.S. Chemistry
Ph.D. Chemistry

(The department does not accept students who desire a terminal M.S. degree.)

Chemistry–Premedical Majors

Either a biochemistry/chemistry major or a chemistry major with appropriate choice of electives provide a strong background for students intending to pursue careers in the medical sciences. Premedical students are encouraged to complete the three-quarter 140 organic sequence in their sophomore year. Most medical schools require a full year of organic chemistry. Biology BILD 1 is strongly recommended, along with certain upper-division biology courses, which can be counted toward the major requirements in chemistry.

General Chemistry

Chem. 11, 12, 13 is a terminal sequence for non-science/non-engineering majors. Chem. 15 and 16 are one-quarter survey courses suitable for non-science majors (students should check with their college adviser to determine applicability toward degree requirements). The Chem. 6 sequence (6A-6B-6C) 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. A student intending to major in chemistry can thus begin with 4 or 6A, 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.

Undergraduate Major Programs

Lower-Division Requirements

The following courses must be taken for a letter grade:

1. General chemistry (Chem. 6A-B-C) including laboratory (Chem. 6BL-CL or equivalent).
2. Phys. 2A-B and D or C (Phys. 1A-B-C is acceptable only by petition). Two units of physics laboratory. Phys. 2CL is recommended. (Phys. 2BL and 2DL are acceptable.) Phys. 2CL is accessible without Phys. 2C.
3. Calculus through Math. 20D (differential equations), either Math. 20A-20D or Math. 1A, 1B, 1C, 20C (two units), 20D.
4. Chemical Physics, Chemical Education, Environmental Chemistry and Pharmacological Chemistry have different lower-division requirements. See below.
5. Recommended, but not currently required: Math. 20F and a course in computer programming.

Upper-Division Requirements

The minimum passing grade is a D, and a minimum of a 2.0 average in the major is required for the degree. Except for independent research (Chem. 199) and chemistry instruction (Chem. 195), majors may not take chemistry courses on a P/NP basis. Chem. 195 and Chem. 199 must be taken on a P/NP basis.

Transfer students must pass at least twenty-four units of upper-division courses required for the major while officially enrolled at UCSD.

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.

Biochemistry

The following program is designed for biochemistry and premedical students desiring a strong background in chemistry. The core biochemistry offering is a sequence of three quarters of lecture plus one laboratory in the junior year. This is followed by three advanced biochemistry courses in the senior year. These three latter courses may be substituted by certain courses in biology and chemistry and biochemistry.

The complete upper-division requirements are:

1. Two quarters of physical chemistry (Chem. 126, 127 recommended; 131, 132 acceptable).
2. Three quarters of organic chemistry (Chem. 140A-B-C).
3. One quarter of inorganic chemistry (Chem. 120A).
4. Three quarters of biochemistry (Chem. 114A-B-C).
5. Five laboratory courses (Chem. 143AM or 143A, 143B, 105A, either 112A or 112B and one additional lab).
6. Two elective courses from the following list: Chem. 112B, 113, 116, 117, 118, 121, 122, 147, 167.
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: 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:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
	Math. 20B	Chem. 6BL
Math. 20A	Phys. 2A	Math. 20C
SOPHOMORE YEAR		
Chem. 140A	Chem. 140B	Chem. 140C
Chem. 6CL	Chem. 143AM	BILD 1*
Math. 20D	Phys. 2B	Chem. 143B
JUNIOR YEAR		
Chem. 114A	Chem. 114B	Chem. 114C
Chem. 126	Chem. 127	Chem. 105A
Phys. 2D***	Phys. 2CL	
SENIOR YEAR		
Chem. 120A	Elective Lab	Elective Lab
Elective	Elective	Elective

* Recommended, but not required.

[redacted]

The upper-division requirements for the chemistry major are:

1. One year of physical chemistry (131, 132, 133)
2. One year of organic chemistry (140A-B-C).
3. Two quarters of inorganic chemistry (120A, 120B).
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, or 143C).
6. Three additional four-unit upper-division or graduate courses in chemistry and biochemistry or related areas. At least two of these courses must be other than 195 or 199.

Suggested Program for Chemistry B.S. Major:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6BL
		Chem. 6C
Math. 20A	Math. 20B	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. 131	Chem. 132	Chem. 133
Chem. 120A	Chem. 120B	Chem. 105A
Phys. 2D	Phys. 2CL	
SENIOR YEAR		
Chem. 114A	Elective Lab	Elective
Elective Lab	Elective	Elective

[redacted]

Chemical physics 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. It requires completion of Phys. 2A-2D, Chem. 6A-6C, and the Math. 20 sequence through 20F by the end of the sophomore year, along with the lower-division labs Chem. 6BL, 6CL, and Phys. 2CL or equivalent. The upper-division requirements are the same as for the chemistry B.S. major, except: Chem. 140C is not required. Chem. 114A is not required, but can substitute for Chem. 120B. The five upper-division chemistry labs are: Chem. 105A, 106, 143AM or 143A, 143C and one of the following: 105B, 112A, 112B, 123, or 143B. Chem. 135 or 136, Math. 110, Phys. 110A and 110B, or 100A and 100B are required, plus one additional course in physical chemistry or related areas as approved by an adviser. This course may be Chem. 199.

Suggested Program for Chemical Physics B.S. Major:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6BL
Math. 20A	Math. 20B	Chem. 6C
	Phys. 2A	Math. 20C
		Phys. 2B
SOPHOMORE YEAR		
Chem. 6CL	Chem. 143AM	Math. 20F
Chem. 140A	Chem. 140B	Phys. 2CL
Math. 20D	Math. 20E	Phys. 2D
	Phys. 2C	
JUNIOR YEAR		
Chem. 131	Chem. 132	Chem. 133
Chem. 143C	Chem. 105A	
Phys. 110A	Phys. 110B	Math. 110
or Phys. 100A	or Phys. 100B	
or Chem. 120A	or Chem. 120B	
SENIOR YEAR		
Chem. 120A	Chem. 120B*	Chem. 135
or Phys. 110A	or Phys. 100A	
or Phys. 110B	or Phys. 100B	
Elective Lab	Chem. 106	Elective

*Chem. 114A (fall quarter) may be substituted.

[redacted]

A chemistry major with specialization in earth sciences is also available for undergraduates.

The required upper-division chemistry courses are: Chem. 140A, 140B; Chem. 131, 132, 133; Chem. 120A; Chem. 114A or Chem. 120B. The five upper-division labs are: 105A, 106, 143AM or 143A, ES 162L and one of the following: 105B, 112A, 112B, 123, 143B, or 143C. The specifically required earth sciences courses are: ES 101, Introduction to Earth Sciences; ES 103, Introduction to Geophysics; ES 102, Introduction to Geochemistry; ES 120, Mineralogy; and ES 162A, Field Geology. At least two other courses from the following list are required: SIO 244, 245A, 245B, 253, Chem. 170, 171, 173. Petrology (SIO 253) is essential for geology students. SIO 253 and 245A 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:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
		Chem. 6BL
Math. 20A	Math. 20B	Math. 20C
SOPHOMORE YEAR		
Chem. 6CL	Chem. 140B	
Chem. 140A	Phys. 2A	Phys. 2B
Math. 20D	Chem. 143AM	Phys. 2CL
JUNIOR YEAR		
Earth. Sci. 101	Earth. Sci. 102	Earth. Sci. 103
Chem. 131	Chem. 132	Chem. 133
Phys. 2D*	Chem. 105A	
SENIOR YEAR		
Chem. 114A*	Earth. Sci. 120	Elective
Chem. 120A	Earth. Sci. 162	Elective Lab
Elective	Earth. Sci. 162L	
	Chem. 106	

*Chem. 120B (winter quarter) may be substituted.

This program offers an excellent preparation for teaching physical science in secondary schools, including chemistry, physics, earth science, biology, and mathematics. The chemical education program has American Chemical Society accreditation.

The chemical education program is sufficiently intensive that students with this degree should be admissible as graduate students to most universities.

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.

Lower-Division Requirements for Chemical Education B.S. Major

The following courses must be taken for a letter grade:

1. General chemistry (Chem. 6A-B-C) including laboratory (Chem. 6BL-CL or equivalent).
2. Phys. 2A-B-D (2C can substitute for 2D). Two units of physics laboratory. Phys. 2CL is recommended. (Phys. 2BL and 2DL are acceptable.) Phys. 2CL is accessible without Phys. 2C.
3. Math. 20A-20C.
4. Biol. BILD1.
5. A course in computer programming is recommended.

Upper-Division Requirements

1. Two quarters of physical chemistry (Chem. 126-127 recommended; 131-132 acceptable).
2. Three quarters of organic chemistry (Chem. 140A-B-C).
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, or 143C).
6. One chemistry elective course.
7. Two earth science courses, ES 101 and ES 102 or 103. (Other biology or chemistry courses may be arranged by petition.)
8. Chem. 195.
9. Chem. 199 or Chem. 196.
10. TEP 129A-B-C.

Suggested Program for Chemical Education B.S. Major:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
	Biol. BILD 1	Chem. 6BL
Math. 20A	Math. 20B	Math. 20C
SOPHOMORE YEAR		
Chem. 140A	Chem. 140B	Chem. 140C
Chem. 6CL	Chem 143AM	Chem. 143B
Phys. 2A	Phys. 2B	Phys. 2D
JUNIOR YEAR		
Chem. 126	Chem. 127	Chem. 195
Phys. 2CL	Elective Lab	Chem. Elective
Earth Sci. 101	Earth Sci. 102	
SENIOR YEAR		
Chem. 120A	Chem. 105A	Elective Lab
Chem. 114A	Chem. 199 or 196	
TEP 129B	TEP 129B	TEP 129C

Environmental Chemistry Major

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 student's area of interest, such as economics, political science, biology, earth science, or additional chemistry. The program is designed to prepare students to enter the burgeoning industry surrounding waste management or to continue studies in the environmental sciences. Students fulfilling their elective requirements with chemistry and biochemistry courses would be prepared to attend graduate school in a chemical science.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. General chemistry (Chem. 6A-B-C) including laboratory (Chem. 6BL-CL or equivalent).
2. Phys. 2A-B-D (Phys. 1A-B-C is only acceptable via petition).
3. Math. 20A-20C.

Upper-Division Requirements

1. Two quarters of physical chemistry (Chem. 126-127 recommended; 131-132 acceptable).
2. Two quarters of organic chemistry (Chem. 140A-B).
3. One quarter of inorganic chemistry (Chem. 120A) or a third quarter of organic chemistry (Chem. 140C).
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 elective courses chosen from the following list (**at least one course** must be upper-division): Econ. 2A, Econ. 2B, Econ. 10 (was 2C), Econ. 131, Econ. 132, History US 154, Philosophy 186, Poli. Sci. 160AA, Poli Sci. 160AB, Soc. 184, Soc. 185, USP 2, USP 105, USP 175.
2. Four 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. 122, Chem. 123, Chem. 140C, Chem. 143B, Chem. 143C, Chem. 170, Chem. 171, Chem. 199, Math. 20D, ES 40, ES 101, ES 102, ES 103, BILD 1, BILD 2, BILD 3, BIEB 120, BIEB 121, BIEB 176, BIEB 178, BIEB 179, AMES 119A, AMES 119B, AMES 119C.

Suggested Program for Environmental Chemistry B.A. Major

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Math. 20C
		Chem. 6BL

SOPHOMORE YEAR		
Chem. 140A	Chem. 140B	Chem. 140C or Elect.
Chem. 149A	Chem. 149B	Chem. 173
Chem. 6CL	Chem. 143AM	
	Phys. 2A	Phys. 2B
JUNIOR YEAR		
Chem. 126	Chem. 127	Elect.
Elect.	Elect.	
Phys. 2D	Elect.	
SENIOR YEAR		
Chem. 114A	Chem. 106	Elect.
Chem. 120A or Elect.	Elect.	Elect.

Pharmacological Chemistry

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 training as pharmacists in pharmacy school, but students fulfilling their elective requirements with appropriate courses would be prepared for graduate school to obtain a Ph.D. in pharmacology or other areas of science. Degree recipients would also be prepared for most jobs in the biotechnology and chemical industries.

The following courses must be taken for a letter grade:

Lower-Division Requirements

1. Biology BILD 1,2 and 3, together with one Biology lab (BICD 101, 111, 131, or BIPN 105), or a year of biology with laboratory at a community college.
2. General chemistry (Chem. 6A-B-C) including laboratory (Chem. 6BL-CL or equivalent).
3. One year of physics plus one unit of physics laboratory (Phys. 2A-B, D or C; Phys. 1A-B-C is only acceptable via petition; and Phys. 1CL or equivalent).
4. Calculus through differential equations (Math. 20A–20D, or equivalent).
5. One quarter of economics (1A or 1B or equivalent).
6. Pharmacology seminar (Chem. 92, 1 unit).

The Schools of Pharmacy at the University of the Pacific and at the University of Southern California require a course in public speaking for admission to the school. Students planning to apply to UOP or USC 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; 131-132 acceptable).
2. Three quarters of organic chemistry (Chem. 140A-B-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 (students using Chem. 120A to satisfy this requirement would obtain an ACS certified degree).

Suggested Program for Pharmacological Chemistry B.S. Major:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
Math. 20A	Math. 20B	Math. 20C
	Biol. BILD 1	Chem. 6BL
		Chem. 92
SOPHOMORE YEAR		
Chem. 140A	Chem. 140B	Chem. 140C
Chem. 6CL	Chem. 143AM	Chem. 143B
Math 20D	Phys. 2A	Phys. 2B
JUNIOR YEAR		
Chem. 114A	Chem. 114B	Chem. 114C
Phys. 2D	Econ. 1A/1B	Biol. BILD 3
Chem. 143C	Biol. BILD 2	Phys. 1CL
SENIOR YEAR		
Chem. 120A	Bio. lab*	Chem. 118
Chem. 126	Chem. 127	(Elective)

*Bio. BICD 101, 111, 131, or BIPN 105.

Honors Program

The Department of Chemistry and Biochemistry offers an Honors Program to those students who have demonstrated excellence in any of the seven 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.
3. Submitted a final honors research report to three UCSD faculty members, including their research adviser, for approval.
4. Presented of an oral report about their research before a group of at least three faculty. This can be at an undergradute 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.

Minor Programs in Chemistry

A typical minor in chemistry consists of three lower-division courses, such as Chem. 6A-B-C, followed by a sequence of three upper-division courses focused in physical, inorganic, organic, environmental chemistry or biochemistry. 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 and must be taken for a letter grade. The Warren College program of concentration is similar, but not identical, to a minor.

Contiguous Bachelor's/ Master's Degree Program

The department offers a contiguous bachelor's/master's degree program. It is limited to students with a bachelor's degree from the Department of Chemistry and Biochemistry at UCSD. A minimum undergraduate GPA of 3.0 is required for admission. Contact the Undergraduate Student Programs Office in 4010 York Hall for more information.

Graduate students are accepted to the Department of Chemistry and Biochemistry for study toward the Ph.D. in chemistry. The goal of the graduate program is to prepare students for academic and industrial careers in science by expanding their knowledge of the chemical sciences and developing their ability for critical analysis 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, inorganic, organic, and physical chemistry. There is a strong interdisciplinary nature to many of the department's research programs and almost every area of contemporary chemical science is represented. 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 Material Science Program, School of Medicine, 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 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. Inorganic, organic, and physical chemistry students then consult with faculty to discuss research opportunities. Biochemistry students do research rotations with various faculty members. 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 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 four 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 is 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, but it is recommended that a student acquire at least a reading knowledge of one foreign language, preferably German or Russian.

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.

[redacted]

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.

[redacted]

The department supports all first-year students in good academic standing from a variety of sources, including teaching and research assistantships, 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 as research assistants by their research adviser.

[redacted]

The department seeks bright, motivated 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. Admissions to the graduate program is for fall quarter. Applications received by January 10 receive priority consideration.

[redacted]

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. Cannot be taken for credit after any other chemistry course. Includes a combined laboratory and discussion-recitation each week. *Prerequisite: Math. 4C. Cannot be taken for credit after any other chemistry course.* (F)

6A. General Chemistry (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 1A (may be taken concurrently).* (F,W,S)

6AH. Honors General Chemistry (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. *Prerequisites: proficiency in high school chemistry, physics and mathemtics. Concurrent enrollment in Math. 20A or higher level calculus required.* (F)

6B. General Chemistry (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. 20A or 1A.* (F,W,S)

6BH. Honors General Chemistry (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. 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, analytical, and physical chemistry. If 6BL is a requirement for your major, it should be taken concurrently with 6B, or 6C. (F,W,S)

6C. General Chemistry (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 (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. *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.* (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 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.

16. Chemistry and Society (4)
This course examines the importance of chemistry to our modern society. Topics covered include nuclear chemistry and nuclear power, medical applications, polymers and materials, ozone depletion, global warming, water chemistry, and cancer. Cannot be taken for credit after any other chemistry course. To be taken for a letter grade ONLY. (May not be offered every year.) (S)

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.

UPPER-DIVISION

105A. Physical Chemistry Laboratory (5)
Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 6CL and Phys. 2CL or equivalent, Chem. 131 or 133 or 126 or 127.* (F,W,S)

105B. Physical Chemistry Laboratory (4)
Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 105A and 133.* (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.* (W)

107. Synthetic Macromolecules (4)
The organic and physical 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. 126 or 131 and 140B or 141B.* (May not be offered every year.)

112A. Molecular Biochemistry Laboratory (6)
The application of techniques, including electrophoresis, peptide mapping and sequencing, affinity chromatography, amino acid analysis, gas-liquid chromatography, and enzyme functions and the chemistry of lipids, carbohydrates, and nucleic acids. *Prerequisites: Chem. 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.) (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.) (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 strongly recommended (Chem. 141A or 140A).* (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)

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: elementary physical chemistry, organic chemistry, and biochemistry.* (May not be offered every year.)

117. Biochemistry of Human Disease (4)
An advanced course in biochemistry which will deal primarily with the molecular basis of human disorders. *Prerequisite: elementary biochemistry.* (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 and admission to Pharmacological Chemistry major, or consent of instructor.* (May not be offered every year.)

120A. Inorganic Chemistry (4)
The chemistry of the main group elements is presented in terms of atomic structure, ionic and covalent bonding. Structural theory involving s, p, and unfilled d orbitals is described. Thermodynamic and spectroscopic criteria for structure and stability of compounds are presented and chemical reactions of main group elements discussed in terms of molecular structure and reactivity. *Prerequisites: a general chemistry course. Chem. 141A or equivalent course is recommended.* (F)

120B. Inorganic Chemistry (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 is discussed in terms of valence bond, crystal field, and molecular orbital theory. The properties and reactivities of transition metal complexes including organometallic compounds are discussed. *Prerequisite: Chem. 120A.* (W)

121. Bioenergetics (4)
Discussion of current understanding of mechanisms of muscle contractions, photosynthesis, bioluminescence, chemiluminescence, and active transport will be presented. *Prerequisites: organic chemistry and introductory biochemistry.* (May not be offered every year.)

122. Biochemical Evolution (4)
This course emphasizes the chemical aspects of evolution, including the origin of living systems on earth, primitive energy acquisition devices, the coupling of information storage and replication catalysis, protein evolution, and the biochemical unity and diversity of extant organisms. *Prerequisites: organic chemistry and introductory biochemistry.* (May not be offered every year.)

123. Advanced Inorganic Chemistry Laboratory (4)
Synthesis, analysis, and physical characterization of inorganic chemical compounds. *Prerequisite: Chem. 120A, 120B, 143A, and 143B.*

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; or equivalent.* (May not be offered every year.)

126. Physical Chemistry (4)
An introduction to physical chemistry with emphasis on biochemical and environmental applications. Quantum mechanics, atomic and molecular structure, spectroscopy. *Prerequisites: Chem. 6C, Math. 20C and 20D or consent of instructor.*

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. *Prerequisites: Chem. Chem. 6C, Math. 20C and 20D, or consent of instructor.* (W)

128. Physical Chemistry–Applied Spectroscopy (4)
The electromagnetic spectrum: rotational, vibrational, and electronic spectra, nuclear and electron magnetic resonance. X-ray diffraction. *Prerequisites: Chem. 6C, Math. 20C and 20D, Chem. 127 or 132, or consent of instructor.* (S)

131. Physical Chemistry (4)
Thermodynamics, chemical equilibrium, phase equilibrium, chemistry of solutions. *Prerequisites: Chem. 6C, Math. 20C, 20D, or consent of instructor.* (F)

132. Physical Chemistry (4)
Chemical statistics, kinetic theory, reaction kinetics. *Prerequisites: Chem. 6C, Math. 20C, 20D, Chem. 131, or consent of instructor.* (W)

133. Physical Chemistry (4)
Quantum mechanics, atomic and molecular spectroscopy, molecular structure. *Prerequisites: Chem. 6C, Math. 20C and 20D, Phys. 2D or equivalent, or consent of instructor.* (S) (Formerly Chem. 130.)

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.) (W)

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.)

136. Elementary Statistical Thermodynamics (4)
Equilibrium, distribution functions, development of partition functions; derivation of thermodynamic properties of simple systems from partition functions. *Prerequisites: Chem. 131, 132, 133, Math. 20D.* (Formerly Chem. 133.) (May not be offered every year.)

140A. Organic Chemistry (4)
An introduction to organic chemistry, with emphasis on material fundamental to biochemistry. Topics include bonding theory, isomerism, stereochemistry, chemical and physical properties, and an introduction to substitution, addition, and elimination reactions. *Prerequisite: Chem. 6C or equivalent course in general chemistry.*(NOTE: Students may not receive credit for both 140A and 141A.) (F,W,S)

140B. Organic Chemistry (4)
A continuation of 140A; acid/base reactions, chemistry of the carbonyl group, sugars, peptides, nucleic acids and other natural products. *Prerequisite: Chem. 140A (a grade of C or higher in Chem. 140A is strongly recommended).* (NOTE: Students may not receive credit for both 140B and 141B.) (F,W,S)

140C. Organic Chemistry (4)
A continuation of Chemistry 140A-B. Organic chemistry of biologically important molecules: carbohydrates, proteins, fatty acids, biopolymers, natural products, drugs; models for enzymatic reactions, synthetic methods, and methods of analysis. *Prerequisite: Chem. 140B.* (NOTE: Students may not receive credit for both 140C and 141C.) (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 com-

pounds 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 141A, this course applies the structure-reactivity, spectroscopy, and electronic theories introduced in 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 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)

142. Natural Products Chemistry (4)
An outline of the chemistry of terpenes, steroids, alkaloids, and plant phenols developed on the basis of modern biogenetic theory. Special emphasis will be given to biologically active substances such as hormones and antibiotics. *Prerequisites: Chem. 140A-B-C, or 141A-B-C.* (May not be offered every year.)

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. 141A or Chem. 140A.* (NOTE: Students may not receive credit for both Chem. 143A and Chem. 143AM.) (F,W,S)

143AM. Majors 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. 141A.* (NOTE: Students may not receive credit for both Chem. 143AM and Chem. 143A.) (W)

143B. Organic Chemistry Laboratory (4)
Continuation of 143AM or 143A, emphasizing synthetic methods of organic chemistry for chemistry majors only. *Prerequisites: Chem. 143A; 141B or 140B (may be taken concurrently).* (S)

143C. Organic Laboratory (5)
Identification of unknown organic compounds by a combination of chemical and physical techniques for chemistry majors only. *Prerequisites: Chem. 6CL, 143A, 141C (may be taken concurrently); 143B suggested.* (F)

147. Mechanisms of Organic Reactions (4)
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. *Prerequisite: Chem. 141C or 140C.* (May not be offered every year.)

148. Synthetic Methods in Organic Chemistry (4)
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. *Prerequisite: Chem. 141C or consent of instructor.* (May not be offered every year.)

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)

153. Topics in Biophysics/Photobiology (4)
Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. *Prerequisite: upper-division standing in biology, chemistry, or physics, or consent of the instructor.* (Same as BIBC 153, Phys. 153.)

167. Biochemistry of Lipid Diseases (4)
The central theme of this course will be to develop a broad understanding of the basic biochemical aspects of lipid metabolism, the regulation of lipid metabolism and application to the treatment of specific human diseases. *Prerequisite: biochemistry.* (May not be offered every year.)

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)

185. Introduction to Computational Chemistry (4)
This course in computational methods builds on a background in mathematics and physical chemistry. After a brief introduction and background in computational theory, topics will include molecular mechanics, semi-empirical methods, and ab initio-based methods of increasing elaboration. Emphasis will be on applications and reliability. *Prerequisites: Chem. 126 or 133 (formerly 130) and Math. 20C.* (May not be offered every year.)

190. Mathematical Methods of Chemistry (4)
Applied mathematics useful for kinetics, thermodynamics, statistical mechanics and quantum mechanics. Topics include ordinary and partial differential equations, special functions, probability and statistics, vector functions and operators, linear algebra, and group theory. *Prerequisites: general chemistry, one year of 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. Senior 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 Deparment of Chemistry faculty. Students must register on a P/NP basis. *Prerequisite: consent of instructor and department.*

199. Senior 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 faculty. Students must register on a P/NP basis. *Prerequisite: 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. (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, HDDH-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.) (S)

210. Seminar in Biochemistry (2)
Seminars presented by graduate students which will explore topics in specialized areas of biochemistry and provide opportunities for students to gain experience in oral presentation of information from the literature. Each quarter a different topic is discussed. (May not be offered every year.)

211. Metabolic Biochemistry (4)
A comprehensive course in biochemistry emphasizing metabolic and human biochemistry. *Prerequisites: physical and organic chemistry; graduate-student standing.* (F)

212. Biochemistry of Growth Regulation and Oncogenesis (4)
An introduction to the biochemistry of growth regulation and oncogenesis. Topics include: tryosine protein kinases; growth factor receptors; control of cell proliferation; transformation by papovaviruses and retroviruses. Designed for graduate students, but suitable for undergraduates with consent of instructor. *Prerequisite: biochemistry, molecular biology, or equivalent.* (May not be offered every year.)

213. Chemistry of 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 physical and organic chemistry.* (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. *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 coenzyme chemistry are emphasized. *Prerequisite: organic chemistry.* (May not be offered every year.)

217. 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.* (F)

218. Structural 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.* (May not be offered every year.)

220. Advanced Inorganic Chemistry (4)
Introduction to theoretical inorganic chemistry. Chemistry of typical main group and transition elements; coordination compounds; organometallic chemistry, catalysis, experimental techniques. *Prerequisites: Chem. 120B, 141C, and 131.* (May not be offered every year.)

221. Bioenergetics (4)
A discussion of the mechanisms for the generation and utilization of ATP in biological systems will be discussed. Specific topics will include oxidative phosphorylation, photophosphorylation, active transport muscle contraction, bioluminescence, and chemiluminescence. *Prerequisites: organic chemistry and introductory biochemistry.* (May not be offered every year.)

222. Biochemical Evolution (4)
The course emphasizes the chemical aspects of evolution, including the origin of living systems on earth, primitive energy acquisition devices, the coupling of information storage and replication catalysis, protein evolution, and the biochemical unity and diversity of extant organisms. *Prerequisites: organic chemistry and introductory biochemistry.* (May not be offered every year.)

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 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. Metals in Chemistry (4)
The roles that metal ions play in biological systems. Emphasis on transition-metal enzymes and proteins as they function in processes such as oxygen transport, electron transfer, oxygenation, and nitrogen fixation. Storage and transport of metal ions, metal complexes in medicine, and toxicity of metal ions. (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.*

228. Solid State Chem istry (4)
Survey of the chemistry of semiconductors, superconductors, molecular magnetic materials, zeolites, fast ion conductors, electronically conducting polymers, and ceramics. Synthetic 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)
(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. 133, 131 and 132, or equivalent.* (May not be offered every year.)

233. Molecular Dynamics (4)
Linear response theory, time correlation functions, and spectral densities. Schmoluchowski, Langevin, and Fokker-Planck equations; nonlinear behavior. Newtonian and Brownian molecular dynamics calculations. *Prerequisite: Chem. 232.* (May not be offered every year.)

234. Thermodynamics (4)
Thermodynamics of chemical systems; the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium, solutions. *Prerequisites: Chem. 131, 132 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. *Prerequisites: Chem. 133 or equivalent; Math. 20D or Chem. 190/290.* (May not be offered every year.)

236. Atherosclerosis (2)
This multidisciplinary course integrates the studies of the pathogenesis of atherosclerosis, with emphasis on lipoprotein metabolism, and the cellular and biochemical mechanisms of lesion development. Two-hour lectures. Same as Medicine 236. *Prerequisite: biochemistry.* (May not be offered every year.)

237. Molecular Glycobiology (2)
Molecular glycobiology encompasses studies of the structure, biosynthesis and biological roles of oligosaccharide units on glycoconjugates. This course will provide an overview of this rapidly evolving field with an emphasis on the glycoconjugates of eucaryotic organisms in the animal kingdom. (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 (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.)

242. Natural Products Chemistry (4)
An outline of the chemistry of terpenes, steroids, alkaloids, and plant phenols developed on the basis of modern biogenetic theory. Special emphasis will be given to biologically active substances such as hormones and antibiotics. *Prerequisites: Chem. 140A-B-C or 141A-B-C.* (May not be offered every year.)

244. Synthesis of Complex Molecules (4)
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. *Prerequisite: Chem. 148 or 248.* (May not be offered every year.)

245. Structure and Properties of Organic Molecules (4)
Introduction to the measurement and theoretical correlation of the physical properties of organic molecules. Topics to be covered include molecular orbital theory, bond lengths, bond energies, dipole moments, ionization potentials, infrared and ultraviolet spectra, nuclear magnetic resonance, and electron spin resonance. (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, substitute effects, solvent effects, linear free energy relationship;

product studies, stereochemistry; reactive intermediates; rapid reactions. (May not be offered every year.)

247. Mechanisms of Organic Reactions (4)
A qualitative approach to the mechanism 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 graduate organic chemistry sequence. *Prerequisite: Chem. 141C.* (May not be offered every year.)

248. Synthetic Methods in Organic Chemistry (4)
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. *Prerequisite: Chem. 141C or consent of instructor.* (May not be offered every year.)

249. Special Topics in Organic Chemistry (2-4)
(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)

267. Biochemistry of Lipid and Lipoprotein Diseases (4)
The central theme of this course will be to develop a broad understanding of the basic biochemical aspects of lipid metabolism, the regulation of lipid metabolism, and application to the treatment of specific human diseases. (May not be offeredevery year.)

270A-B-C. Current Topics in Environmental Chemistry (2-2-2)
Formal lecture 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.* (May not be offered every year.)

272. Nuclear and Cosmochemistry (4)
Introduction to cosmochemistry with emphasis on nuclear aspects. Structure and properties of nuclei. Nuclear reactions. Radioactive decay processes. Abundance and synthesis of the elements. Chronology of events in the early solar system. Origin and early history of the solar system. Effects of cosmic-ray bombardment. *Prerequisite: consent of instructor.* (May not be offered every year.)

285. Introduction to Computational Chemistry (4)
This course in computational methods builds on a background in mathematics and physical chemistry. After a brief introduction and background in computational theory, topics will include molecular mechanics, semi-empirical methods, and ab initio-based methods of increasing elaboration. Emphasis will be on applications and reliability. *Prerequisites: Chem. 126 or 133 and Math. 20C.* (May not be offered every year.)

290. Mathematical Methods in Chemistry I (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.)

291. Mathematical Methods in Chemistry II (4)
Probability and statistics, integral transforms, Cartesian and spherical tensors and their transformations. *Prerequisite: Chem. 290.* (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)

298. Special Study in Chemistry (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. (S/U grades only.) Credit is limited to four units per quarter. (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

Professors

Joseph C.Y. Chen, Ph.D., *Physics*
Matthew Y. Chen, Ph.D., *Linguistics*
Joseph W. Esherick, Ph.D., *History, Chair*
Germaine A. Hoston, Ph.D., *Political Science*
Chalmers Johnson, Ph.D., *IR/PS*
David K. Jordan, Ph.D., *Anthropology*
Richard P. Madsen, Ph.D., *Sociology*
Paul G. Pickowicz, Ph.D., *History*
Susan L. Shirk, Ph.D., *Political Science*
William S. Tay, Ph.D., *Literature*
Wai-Lim Yip, Ph.D., *Literature*

Associate Professors

Barry J. Naughton, Ph.D., *IR/PS*
Dorothy Ko, Ph.D., *History*

Adjunct Associate Professor

Suzanne Cahill, Ph.D., *History*

Lecturer WSOE

Ping C. Hu, M.A., *Chinese*

Lecturers

Xiaogang Cha, M.A., *Chinese*
Qian He, *Chinese*

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.

Many of the participating faculty in the program have a converging interest in contemporary China. For this reason, this is one of the strong-est programs on modern Chinese society now available. 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, and Hong Kong. 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.

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 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 1996–1997 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 coordinator.

The Minor Program

A minor in Chinese studies consists of six courses taken for a letter grade (no more than three lower-division) approved by a college. Chinese Studies 11-12-13, Chinese Studies 21-22-23, and History 10-11-12 may apply as lower-division. At least three courses have to be in a discipline other than language study. A list of approved offerings is available quarterly in the Program in Chinese Studies office.

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)

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 at one or more sister institutions in China. Program includes regularly scheduled language classes taught by UCSD staff members; a cultural program of films, stage performances and lectures; and field trips to villages, urban industrial communities, and places of historical interest. The entire program will be conducted in Chinese. *Prerequisites: Chinese Studies 13 or equivalent and consent of instructor.* (Summer)

163. Introduction to Chinese Linguistics (4)
This course is an introduction to linguistics for students of the Chinese language. It covers phonological and grammatical structures, dialectology, and a brief survey of the history of the language.

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.

180. Chinese Cinema (4)
This course surveys the development of Chinese cinema from the 1920s to the present. Emphasis is placed on the ways in which filmmakers have represented such major social problems as family conflict, gender relations, and the tension between traditional and modern cultural modes. *Prerequisite: knowledge of Chinese.*

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.*

185. Syntactic Structures of Chinese (4)
This course introduces the phrase structures and basic word order of Chinese. It compares the most common syntactic structures of modern Chinese and English. *Prerequisite: three years of Chinese 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. *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)

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.

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.

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)

UPPER-DIVISION

I. CHINESE SOCIETY

ANRG 170: Traditional Chinese Society (Jordan)

ANRG 171: Chinese Familism (Jordan)

ANRG 172: Culture and Personality in China (Jordan)

ANRG 173: Chinese Popular Religion (Jordan)

History HITO 102: Asian Religions (Staff)

History HIEA 137: Women and Family in Chinese History (Ko)

II. CONTEMPORARY CHINA

History HIEA 132: History of the People's Republic of China (Pickowicz)

IR/PS IP/Gen 400: International Relations of the Pacific (Johnson)

IR/PS IP/Core 430: Economic and Social Development of China (Naughton)

IR/PS IP/Core 431: Chinese Politics (Shirk)

IR/PS IP/Gen 465: Economy of China (Naughton)

IR/PS IP/Gen 466: Chinese Foreign Policy (Shirk)

Political Science 130CA\-CB: Comparative Communism (Shirk)

Political Science 130B: Politics in the People's Republic of China (Shirk)

Political Science 130D: Seminar–Chinese Politics (Shirk)

Political Science 232: The Chinese Political System (Shirk)

Sociology 188B: Chinese Society (Madsen)

III. LANGUAGE AND LITERATURE

Linguistics 141: Language Structures (M. Chen)

Literature/Chinese 101: Readings in Contemporary Chinese Literature (Tay/Yip)

Literature/Chinese 120: Readings in Classical Chinese Poetry (Tay/Yip)

Literature/Chinese 140A: Classical Chinese Literature (Tay/Yip)

Literature/Chinese 140B: Modern Chinese Literature (Tay/Yip)

Literature/Chinese 140C: Contemporary Chinese Literature (Tay/Yip)

Literature/Comparative: 252: Modernism: East and West (Yip)

Literature/Comparative 274: Genre Studies: History, Politics, and Social Changes in Taiwan Films (Tay)

Literature/English 172: American Poetry II–Chinese Poetry and the American Imagination (Yip)

Literature/General 180: Visual Arts and Literature Landscape Poetry: East and West (Yip)

Literature/General 184: Ethnopoetics (Yip)

Literature/General 185: Literature and Ideas: Taoism (Yip)

Literature/Th 230: Comparative Literary Theory: Classical Chinese Poetics (Yip)

Literature Writing 111: Prose Poem (Yip)

IV. CHINESE HISTORY

History HIEA 120: The History of Chinese Culture and Society: The Ancient Imperial Period (Ko)

History HIEA 121: The History of Chinese Culture and Society: The Middle Imperial Period (Ko)

History HIEA 122: The History of Chinese Culture and Society: The Late Imperial Period (Ko)

History HIEA 137: Women and Family in Chinese History (Ko)

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 163: Cinema and Society in Twentieth-Century China (Pickowicz)

History HIEA 164: Seminar in Late Imperial Chinese History (Ko)

History HIEA 165: The Chinese Village in Transition: 1930–1956 (Pickowicz)

History HIEA 167: Special Topics on Modern Chinese History (Esherick)

History HIEA 168: Chinese Thought from Chou through Sung (Staff)

History HIEA 169: Literature and Society in Republican China (Pickowicz)

Classical Studies

OFFICE: 3071 Humanities and Social Sciences Building, Muir College (CAESAR office)

Professors

Georgios H. Anagnostopoulos, Ph.D., *Philosophy*
Page Ann duBois, Ph.D., *Classical and Comparative Literature*
William Fitzgerald, Ph.D., *Classical and Comparative Literature*
Richard E. Friedman, Ph.D., *Hebrew and Comparative Literature*
Edward N. Lee, Ph.D., *Philosophy*
Marianne McDonald, Ph.D., *Theatre*
Alden A. Mosshammer, Ph.D., *History*

Associate Professors

Anthony T. Edwards, Ph.D., *Classical Literature and Languages*
Sheldon Nodelman, Ph.D., *Visual Arts*

Assistant Professor

Gary Shiffman, Ph.D., *Political Science*

Lecturers

Charles Chamberlain, Ph.D., *Classical and Comparative Literature*
Leslie Collins Edwards, Ph.D., *Classical Litera ture 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, 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 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– ml or better.

GREEK

Classical Studies 19A-B-C are a prerequisite to the Greek major. Six of the twelve upper-division courses must be Lit/Greek courses numbered 100 and above, but exclusive of Lit/Greek 101. The remaining six courses may be in classical civilization (in English translation), selected from the list of approved courses from history, Lit/General, philosophy, political science, and visual arts, though additional Lit/Greek courses numbered 100 and above (including Lit/Greek 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

Classical Studies 19A-B-C are a prerequisite to the Latin major. Six of the twelve upper-division courses must be Lit/Latin courses numbered 100 and above, but exclusive of Lit/Latin 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/General, philosophy, political science, and visual arts, though additional Lit/Latin courses numbered 100 and above (including Lit/Latin 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

Classical Studies 19A-B-C are a prerequisite to the classics major. Nine of the twelve upper-division courses must be distributed between Lit/Latin and Lit/Greek courses numbered 100 and above (but exclusive of Lit/Latin 101 and 102 and Lit/Greek 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/General, philosophy, political science, and visual arts, though additional Lit/Latin or Lit/Greek courses numbered 100 and above (including Lit/Latin 101 and 102 and Lit/Greek 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 Classical Studies 19A-B 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 Lit/Greek courses numbered 100 and above (but exclusive of Lit/Greek 101) and Judaic Studies 101-102-103 or Lit/Hebrew courses numbered 148 and above, 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 Lit/Greek courses numbered 100 and above (including Lit/Greek 101) or Judaic Studies 101-102-103 or Lit/Hebrew courses numbered 148 and above 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.

Students who began work before fall 1991 on a major in classical studies, whether at UCSD or elsewhere, as described in a pre-1991 UCSD *General Catalog*, may be eligible to complete the major as described there.

The Minor Programs

CLASSICAL STUDIES:

A minor in classical studies consists of six courses from those listed below, of which at least three must be upper division. A knowledge of the ancient languages is not required. The minor will normally include Classical Studies 19A-B-C: the Greco-Roman World, and three 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 Classical Studies 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.

[redacted]

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. 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 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)
This interdisciplinary sequence includes the literature, mythology, art, philosophy, and history of ancient Greece and Rome, a complex civilization which had a determining influence on all later Western culture.

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.*

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 100. Early Greece (4)

HIEU 101. Greece in the Classical Age (4)

HIEU 102. The Roman Republic (4)

HIEU 103. The Roman Empire (4)

HIEU 105. The Early Christian Church (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)

Lit/Gk 1-2-3. Beginning and Intermediate Greek (4-4-4)

Lit/Gk 100. Introduction to Greek Literature (4)

Lit/Gk 101. Advanced Greek Grammar and Prose Composition (4)

Lit/Gk 110. Archaic Period (4)
Previously Lit/Gk 112.

Lit/Gk 112. Homer (4)

Lit/Gk 113. Classical Period (4)
Previously Lit/Gk 114.

Lit/Gk 118. Hellenistic Period (4)
Previously Lit/Gk 116.

Lit/Gk 120. New Testament Greek (4)
Previously Lit/Gk 119.

Lit/Gk 130. Tragedy (4)
Previously Lit/Gk 104.

Lit/Gk 131. Comedy (4)
Previously Lit/Gk 106.

Lit/Gk 132. History (4)
Previously Lit/Gk 108.

Lit/Gk 133. Prose (4)
Previously Lit/Gk 110.

Lit/Gk 134. Epic Poetry (4)
Previously Lit/Gk 121.

Lit/Gk 135. Lyric Poetry (4)
Previously Lit/Gk 123.

Lit/Gk 199. Special Studies (2 or 4)

Lit/La 1-2-3. Beginning and Intermediate Latin (4-4-4)

Lit/La 100. Introduction to Latin Literature (4)

Lit/La 101. Advanced Grammar and Composition (4)

Lit/La 102. Prose Composition (4)

Lit/La 111. Pre-Augustan (4)
Previously Lit/La 116.

Lit/La 113. Augustan (4)
Previously Lit/La 118.

Lit/La 114. Vergil (4)

Lit/La 116. Silver Latin (4)
Previously Lit/La 120.

Lit/La 120. Late Latin (4)
Previously Lit/La 122.

Lit/La 124. Medieval Latin (4)

Lit/La 126. Renaissance Latin (4)
Previously Lit/La 129.

Lit/La 130. The Novel (4)
Previously Lit/La 106.

Lit/La 131. Prose (4)
Previously Lit/La 108.

Lit/La 132. Lyric and Elegiac Poetry (4)
Previously Lit/La 110.

Lit/La 133. Epic (4)
Previously Lit/La 112.

Lit/La 134. History (4)
Previously Lit/La 114.

Lit/La 199. Special Studies (2 or 4)

Lit/Gen 100. The Classical Tradition (4)
Previously Lit/Gen 120. (May be repeated for credit as topics vary.)

Lit/Gen 181. Mythology (4)
Previously Lit/Gen 119.

Philosophy 101. Plato (4)

Philosophy 102. Aristotle (4)

Philosophy 108. Mythology and Philosophy (4)

Philosophy 199. Independent Study (4)

Pol. Sci. 110A. Systems of Political Thought (Greece and Rome) (4)

Theatre 159. 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

An intercampus Ph.D. program is being planned in collaboration with UC Irvine and UC Riverside. For more information contact Professor Walter Donlan, Department of Classics, 141 C Humanities Hall, UC Irvine, Irvine, California 92717.

HIGR 201. The Literature of Ancient History (4)

HIGR 298. Directed Readings in Greek and Roman History (1-12)

Lit/Co 202A. History of Criticism and Aesthetics (4)

Lit/Co 210. Classical Studies (4)
Prerequisite: working knowledge of either Greek or Latin.

Lit/Gk 297. Directed Studies (1-12)

Lit/Gk 298. Special Projects (4)

Lit/La 297. Directed Studies (1-12)

Lit/La 298. Special Projects (4)

Philosophy 201. Greek Philosophy (4)

Philosophy 202. Hellenistic and Roman Philosophy (4)

Philosophy 290. Directed Independent Study (1-4)

Clinical Psychology

OFFICE: 216 Gifford Mental Health Clinic
(619) 497-6659

Professors

J. Hampton Atkinson, Jr., M.D., *Adjunct/Psychiatry*
Elizabeth Bates, Ph.D., *Psychology/Cognitive Science*
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/Psychology*
Joel E. Dimsdale, M.D., *In-Residence/Psychiatry*
Mark A. Geyer, Ph.D., *In-Residence/Psychiatry*
J. Christian Gillin, M.D., *Psychiatry*
Igor Grant, M.D., *Psychiatry*
Philip M. Groves, Ph.D., *Psychiatry*
Robert K. Heaton, Ph.D., *Psychiatry, Program Director*
Dilip V. Jeste, M.D., *In-Residence/Psychiatry*
Lewis L. Judd, M.D., *Chair of Psychiatry*
Robert M. Kaplan, Ph.D., *Community and Family Medicine*
Daniel F. Kripke, M.D., *In-Residence/Psychiatry*
Marta Kutus, Ph.D., *Cognitive Science*
Saul Levine, M.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., *Clinical/Psychiatry*
Larry R. Squire, Ph.D., *In-Residence/Psychiatry*
Steve Stahl, M.D., Ph.D., *Psychiatry*
Lowell H. Storms, Ph.D., *In-Residence/Psychiatry*
James Varni, Ph.D., *In-Residence/Psychiatry*
Sidney Zisook, M.D., *Psychiatry*

Associate Professors

Sonia Ancoli-Israel, Ph.D., *In-Residence/Psychiatry*
Sandra Brown, Ph.D., *In-Residence/Psychiatry*
Brett Clementz, Ph.D., *Psychology*
Eric Courchesne, Ph.D., *In-Residence/Neurosciences*
Denis Darko, M.D., *Adjunct/Psychiatry*
Dean Delis, Ph.D., *In-Residence/Psychiatry*
Michael Irwin, M.D., *In-Residence/Psychiatry*
Terry Jernigan, Ph.D., *In-Residence/Psychiatry*
James A. Kulik, Ph.D., *Psychology*
James B. Lohr, M.D., *In-Residence/Psychiatry*
Barbara L. Parry, Ph.D., *In-Residence/Psychiatry*
Thomas L. Patterson, Ph.D., *Adjunct/Psychiatry*
Joan Stiles, Ph.D., *Psychology*
Doris A. Trauner, M.D., *Neurology*

Assistant Professors

Mark W. Bondi, Ph.D., *Adjunct/Psychiatry*
Renee Dupont, M.D., *In-Residence/Psychiatry*
David Feifel, M.D., *In-Residence/Psychiatry*
Ann Garland, Ph.D., *Adjunct/Psychiatry*
Eric Granholm, Ph.D., *In-Residence/Psychiatry*
Patricia Judd, Ph.D., *Clinical Psychiatry*
John Kelsoe, M.D., *Psychiatry*
Jeffrey Matloff, Ph.D., *Clinical/Psychiatry*
John R. McQuaid, *Adjunct/Psychiatry*
Mark G. Myers, Ph.D., *Adjunct/Psychiatry*
Sharon Nichols, *Adjunct/Neurosciences*
Arne Ostergaard, Ph.D., *Adjunct/Psychiatry*
Jane Paulsen, Ph.D., *Adjunct/Psychiatry*
William Perry, Ph.D., , *Adjunct/Psychiatry*
Sheri D. Pruitt, Ph.D., *Adjunct/Psychiatry*
Mark H. Rapaport, *In-Residence/Psychiatry*
David P. Salmon, Ph.D., *In-Residence/Psychiatry*
Neal R. Swerdlow, M.D., Ph.D., *In-Residence/Psychiatry*
Tamara L. Wall, Ph.D., *In-Residence/Psychiatry*

The Joint Doctoral Program

The interdisciplinary partnership of the Department of Psychiatry at 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, Community and Family Medicine, Psychology, and 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 224; Clinical Psychology 294; Clinical Psychology 295; 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 224. Introduction to Neuropsychology (1)
Introduction to study of brain-behavior relationships and to clinical neuropsychological assessment.

Clinical Psychology 294. Pro-Seminar in Neuropsychology (3)
Provides a fundamental knowledge of brain-behavior relationships as well as strategies and methods of neuropsychological assessment and rehabilitation.

Clinical Psychology 295. Introduction to Research of UCSD/SDSU Faculty (4)
How to evaluate a psychological experiment; using a research evaluation guide, students will evaluate two faculty papers per week. They will also develop and present their own proposed research projects. (S/U grades only.) *Prerequisite: graduate student status in joint clinical psychology doctoral program or consent of instructor.*

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.

Cognitive Science

OFFICE: 139 Cognitive Science Building

Professors

Richard C. Atkinson, Ph.D., *UC President*
Elizabeth Bates, Ph.D.
Aaron V. Cicourel, Ph.D., *Emeritus*
Jeffrey L. Elman, Ph.D., *Chair*
Gilles Fauconnier, Ph.D.
Edwin L. Hutchins, Ph.D.
Marta Kutas, Ph.D.
Jean M. Mandler, Ph.D.
Donald A. Norman, Ph.D., *Emeritus*
David Zipser, Ph.D.

Associate Professor

David Kirsh, D.Phil.
Martin I. Sereno, Ph.D.

Assistant Professors

John D. Batali, Ph.D.
Javier R. Movellan, Ph.D.
Jaime A. Pineda, Ph.D.
Mark St. John, Ph.D.

Adjunct Professors

Helen J. Neville, Ph.D.
David E. Rumelhart, Ph.D.
Terrence J. Sejnowski, Ph.D., *Biology and Physics*

Undergraduate Education

The Department of Cognitive Science emphasizes three main areas of study: the *brain*–the understanding of neurobiological processes and phenomena; *behavior*–the experimental methods and findings from the study of psychology, language, and the sociocultural environment; and *computation*–the powers and limits of various representational formats, coupled with studies of computational mechanisms. This approach involves a multidisciplinary study of cognition with emphasis on computer science, linguistics, neuroscience, psychology, and related aspects of anthropology, biology, mathematics, philosophy, and sociology.

The study of cognition takes place within the controlled situations of the laboratory and the natural situations of the everyday world, as well as through extensive modeling and simulation studies of these situations. The unit under study ranges from the individual neuron, to neural systems, to the individual person, to social groups in which language, social organization, and culture play important roles. Each level of study can be informed through knowledge of, and the constraints imposed from, adjacent levels of study. The department also is strong in applied research in university, home, and workplace settings.

The underlying philosophy of the department poses special challenges to its faculty and students to be knowledgeable in and sympathetic to a wide variety of fields and techniques. For example, required topics for both undergraduates and graduates include courses in behavior, computation, and the neurobiological basis of cognition.

We have a commitment to student involvement, and students participate in the department by sharing their ideas and suggestions with faculty and staff. Meetings are held at least once a year for students and faculty to discuss the curriculum and other topics. A newsletter is sent to all faculty, students, staff, and visitors associated with cognitive science at UCSD. Undergraduate students may join the Students in Cognitive and Neurosciences (SCANS) organization, which provides opportunities for undergraduates to meet each other as well as faculty from UCSD and other campuses, to visit research laboratories, and to make job contacts. Graduate students select their own representatives for faculty meetings, graduate admissions, departmental TA training and development programs, and the campus-wide Graduate Student Association.

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 more 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.

Grade Requirements for the Major

A minimum grade-point average of 2.0 is required for the B.A. or B.S. degree. 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:	Mathematics 1A-B-C or Mathematics 20A-B-C or Mathematics 20A-B, 21C, and 20F College requirements
Sophomore Year:	Cognitive Science 14, 17, and 18 College requirements

Junior Year: Cognitive Science 101A-B-C
Cognitive Science 107A-B-C
Cognitive Science 108A-B-C

Senior Year: Electives for the major

Lower-Division Requirements

All majors must complete lower-division courses in neurobiology, calculus, methods, and computer programming:

B.A. Requirements

Mathematics 1A-B-C or 20A-B-C
Cognitive Science 14
Cognitive Science 17 or Biology 12
Cognitive Science 18

B.S. Requirements

Mathematics 20A-B, 21C, and 20F
Cognitive Science 14
Cognitive Science 17 or Biology 12
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 three core sequences. Students are advised to complete these core sequences 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:

Cognitive Science 101A-B-C
(Cognitive Theory and Phenomena)

Cognitive Science 107A-B-C
(Cognitive Neuroscience)

Cognitive Science 108A-B-C
(Computational Models of Cognition)

Electives

At least half of the electives for the major must be taken in the department. One Cognitive Science 195 and one 198 or 199 course may be used. 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.

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 from 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.

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.

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.

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.

Honors Program

Majors apply for admission to the honors program during the beginning of their graduating year, although serious thought should be given to the thesis project in the penultimate year. Applicants to the honors program must have a minimum grade-point average of 3.5 in the major and an approved thesis project sponsored by a faculty member within the department. To graduate with departmental honors, students must maintain a minimum grade-point average of 3.5 in the major through graduation, complete an honors thesis (190A-B and possibly C) in the senior year with a grade of A, present the thesis in writing and orally, and complete one approved cognitive science graduate course.

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. The lower-division requirements are normally fulfilled by completing Cognitive Science 10, 11, and 14, 17, or 18. Upper-division requirements are normally fulfilled by completing one of the following sequences:

Cognitive Science 101A-B-C

Cognitive Science 107A-B-C

Cognitive Science 108A-B-C

Cognitive Science 130-131 and 132 or 141

All courses must be taken for a letter grade.

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.

[redacted]

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.

[redacted]

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. In 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 15. 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. Participation in the cognitive science advanced faculty/student seminar series
6. Advancement to candidacy
7. Teaching
8. Participation in departmental events and committees
9. Ph.D. dissertation and defense

Description of Requirements

1. **Foundations Courses (Cognitive Science 201A-B-C-D-E-F-G).** 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.** Issues courses are required, one each in the areas of brain, behavior, and computation. At least half of the issues courses should be taken within the department. Issues courses are completed 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 and, if needed, the BBC Committee.
   b. **Methods Courses.** Three methods courses are required. In the first year, Psychology 201A (or equivalent knowledge) is required. Students are also encouraged to take a statistics course, such as Psychology 201B. In the second year, Cognitive Science 204A-B is taken concurrently with Cognitive Science 203A-B.
   c. **Laboratory Rotations (Cognitive Science 290).** Three rotations in different faculty laboratories are required. Each rotation is for a full quarter, and all rotations should be completed by the end of fall quarter of the second year.
3. **Second-Year Research Project (Cognitive Science 203A-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.
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 an integrative paper that focuses on important readings covering at least two of the three areas of brain, behavior, and computation. The final paper and an oral presentation and defense are completed by the end of spring quarter of the third year.

c. Dissertation Topic. 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 in each of three different academic years. 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, the graduate admissions committee, and the campus-wide Graduate Student Association.

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

Candidates for the Ph.D. 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.

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 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 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 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.

FACULTY

Professors

Norman H. Anderson, Ph.D., *Emeritus, Psychology*
Richard C. Atkinson, Ph.D., *Cognitive Science and Psychology*
Elizabeth Bates, Ph.D., *Cognitive Science and Psychology*
Ursula Bellugi, Ed.D., *Adjunct/Psychology*
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 and Psychology*
Francis H. C. Crick, Ph.D., *Adjunct/Biology*
Roy G. D'Andrade, Ph.D., *Anthropology*
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*
Steven A. Hillyard, Ph.D., *Neurosciences*
Edwin L. Hutchins, Ph.D., *Cognitive Science*
Patricia W. Kitcher, Ph.D., *Philosophy*
Edward S. Klima, Ph.D., *Emeritus, Linguistics*
Marta Kutas, Ph.D., *Cognitive Science*
Ronald W. Langacker, Ph.D., *Linguistics*
George Mandler, Ph.D., *Emeritus, Psychology*
Jean M. Mandler, Ph.D., *Cognitive Science*
Hugh B. Mehan, Ph.D., *Sociology*
Helen J. Neville, Ph.D., *Adjunct/Cognitive Science*
Donald A. Norman, Ph.D., *Emeritus, Cognitive Science*
Harold E. Pashler, Ph.D., *Psychology*
David M. Perlmutter, Ph.D., *Linguistics*
Vilayanur S. Ramachandran, Ph.D., *Psychology*
Walter J. Savitch, Ph.D., (Program Director) *Computer Science and Engineering*
Terrence J. Sejnowski, Ph.D., *Biology*
Allen I. Selverston, Ph.D., *Biology*
Larry R. Squire, Ph.D., *Psychiatry*

David A. Swinney, Ph.D., *Psychology*
David Zipser, Ph.D., *Cognitive Science*

Associate Professors

Farrell Ackerman, Ph.D., *Linguistics*
Gerald J. Balzano, Ph.D., *Music*
Richard K. Belew, Ph.D., *Computer Science and Engineering*
Garrison W. Cottrell, Ph.D., *Computer Science and Engineering*
David Kirsh, D.Phil., *Cognitive Science*
Dennis D. M. O'Leary, Ph.D., *Adjunct/ Neurosciences*
Carol Padden, Ph.D., *Communication*
Martin Sereno, Ph.D., *Cognitive Science*
Joan Stiles, Ph.D., *Psychology*
Stuart Zola, Ph.D., *Psychiatry*

Assistant Professors

Philip Agre, Ph.D., *Communication*
John Batali, Ph.D., *Cognitive Science*
Adrian Cussins, D.Phil., *Philosophy*
Charles P. Elkan, Ph.D., *Computer Science and Engineering*
Adele E. Goldberg, Ph.D., *Linguistics*
Robert E. Kluender, Ph.D., *Linguistics*
Paul Kube, Ph.D., *Computer Science and Engineering*
John Moore, Ph.D., *Linguistics*
Javier R. Movellan, Ph.D., *Cognitive Science*
Jaime A. Pineda, Ph.D., *Cognitive Science*
Mark St. John, Ph.D., *Cognitive Science*
David Salmon, Ph.D., *Neurosciences*

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 Cognitive Science and Linguistics" or "Ph.D. in Cognitive Science and Psychology."

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 at the same time they apply to the home department or after entering UCSD. 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.

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 Cognitive Anthropology (Anthropology 218), Distributed Cognition (Cognitive Science 234), Seminar in Comparative Cognitive Research (Psychology 216), Text and Discourse Analysis (Sociology 204), Ethnomethodology (Sociology 240), and Cognitive and Linguistic Aspects of Social Structure (Sociology 241 and 242). In addition, courses on field methods are offered by both anthropology and sociology.

Computer Science and Artificial Language. This specialization requires a thor-

ough 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 Neurophysiology (Neurosciences 262), 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 Science (Philosophy 212), Philosophy of Language (Philosophy 235), Contemporary Epistemology and Metaphysics (Philosophy 270), Theory of Knowledge (Philosophy 272), Philosophy of Mind (Philosophy 274), 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

3. An Introduction to Computers (4)
A practical introduction to computers and how you can use their power. Designed for beginning undergraduates in the social sciences. Topics include: basic operations of personal computers (MAC, PC), UNIX, word processing, email, spreadsheets, the "information superhighway," and programming. *No previous background in computing required.*

7. Introduction to Cognitive Neuroscience (4)
This course will be an introduction to the emerging field of cognitive neuroscience. It examines the relationship between structural and physiological mechanisms of the brain and the psychological reality of the mind as it relates to attention, memory, language, emotion, and consciousness. May fulfill general education requirement; ask a college adviser.

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: Understanding How Damaged and Normal Brains Influence the Way We Think and Use Language in Our Daily Lives (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 how they affect 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 statistical hypothesis testing and factorial analysis of variance. Emphasis on group and individual projects in which students design experiments, collect data, and interpret the results of statistical tests. Students will become familiar with the main statistical packages for personal computers. May fulfill general education requirements; ask a college adviser.

16. Lower-Division Seminar on Special Topics (1-4)
Special topics in cognitive science are discussed. (May be repeated for credit when topics vary.) *Prerequisite: department approval.*

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. LISP and Symbolic Programming (4)
This course covers the Common Lisp interpreter and environment: functions, variables, and recursion; predicates and control structures; lists, arrays, and structures; symbolic programming; and the use of LISP in artificial intelligence. Laboratory work involves creating, modifying, testing, and debugging LISP programs. *Prerequisite: Mathematics 1A or 20A.*

90. Undergraduate Seminar (1)
Issues and contemporary research in cognitive science are introduced. (May be repeated when topics vary.)

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.)

UPPER DIVISION

101A. Cognitive Theory and Phenomena: Experimental Approaches to Cognition, Part A (4)
This part of the Cognitive Science 101A-B-C sequence focuses on experimental approaches to the study of memory, imagery, knowledge, representation, language, emotion, and development. The interaction between data and cognitive theory is also emphasized. *Prerequisite: upper-division standing.*

101B. Cognitive Theory and Phenomena: Experimental Approaches to Cognition, Part B (4)
This course covers the phenomena and explores the underlying cognitive mechanisms of attention, short-term memory and problem solving, changes in representation and expertise, and several varieties of human learning. *Prerequisites: Cognitive Science 101A; Cognitive Science 14 or Psychology 60 or Mathematics 183.*

101C. Cognitive Theory and Phenomena: Language and Reasoning (4)
This course acquaints students with the complex structural organization behind higher-level cognitive phenomena linked to language and thought. Recursion, induction, and analogy are the focus, with applications to transformational syntax, cognitive semantics, analogical and inductive thought, and judgments under uncertainty. *Prerequisite: Cognitive Science 14 or Philosophy 10.*

107A. Cognitive Neuroscience: Functional Neurobiology (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 17 or Biology 12.*

107B. Cognitive Neuroscience: Systems Neurobiology (4)
This course is devoted to the cognitive aspects of systems neuroscience, with a focus on the visual and motor systems. Many other high order neural systems are also covered. Readings are augmented with lectures on current experimental and theoretical results. *Prerequisites: Cognitive Science 107A and its prerequisites.*

107C. Cognitive Neuroscience: Neural Bases of Cognition (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.*

108A. Theory of Computation and Formal Systems (4)
Syntax and semantics of propositional logic. Digital electronics and the fundamentals of computer architecture. Turing machines, universality and the halting problem. Syntax and semantics of predicate logic. Limitative results of formal logic. *Prerequisite: Mathematics 1A or 20A.*

108B. Artificial Intelligence Modeling I (4)
This course is a basic theoretical introduction to the representations and methods of artificial intelligence. Semantic networks, means-ends analysis, search, production systems, frame-based representations, constraint propagation, stereo vision, and mobots are covered. Course previously offered as Cognitive Science 108A/AL. *Prerequisites: Cognitive Science 18.*

108C. Neural Network Models of Cognition I (4)
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. (Course previously offered as Cognitive Science 108B, Cognitive Science 108P, Cognitive Science 188A, and Psychology 188A.) *Prerequisites: Cognitive Science 18, Cognitive Science 108A, Mathematics 1C or 20C.*

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.*

130. Everyday Cognition (4)
This course examines memory, reasoning, language understanding, learning, and planning directly in everyday, real-world settings. The course work will include discussions of both the findings and the methodology of naturalistic studies of cognition. *Prerequisite: upper-division standing preferred.*

131. Distributed Cognition (4)
This course is a continuation of Cognitive Science 130. 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 130.*

132. Cognitive Engineering (4)
Applications of cognitive science are explored, emphasizing principles for the design of intelligent systems focusing on human-machine interaction whether the users be individuals, groups, or organizations. An extensive project analyzing an existing system or product or designing a new application is required. (This course was previously offered as Psychology 135.) *Prerequisite: Cognitive Science 131.*

141. Observation, Protocol, and Discourse Analysis (4)
This class will assess human problem solving in laboratory and natural settings and their ecological validity. Several exercises will introduce students to protocol analysis and the coding of discourse materials in semi-controlled environments. Students will be introduced to the use of medical expert systems. *Prerequisite: upper-division standing preferred.*

142. Philosophy of Cognitive Science (4)
An examination of the philosophical foundations and implications of cognitive science. Emphasis is placed on understanding how philosophical issues and arguments are relevant to the theory and practice of modern cognitive science. May be repeated for credit where topics vary. *Prerequisite: Upper-division standing.*

150. Semantics (4)
This course is an introduction to the study of meaning, reasoning, and understanding. It examines the ways in which natural language reflects complex human thinking processes. *Prerequisites: upper-division standing preferred.*

153. Language Comprehension (4)
The processes and representations involved in understanding language–processing words, syntax, semantics, and discourse–are examined in light of evidence from both psychological experiments and computer simulations. The course emphasizes connectionist models: how they work and how they simulate psychological results. *Prerequisites: Introductory cognitive science and programming are recommended. Cognitive Science 108C is recommended.*

154. Communication Disorders in Children and Adults (4)
The course will begin with neural bases of language use in normal adults, and the neural bases of language and communication development in normal children. It will review recent evidence on the nature of language and communication deficits in several clinical populations of adults (especially aphasia and dementia) and children (including specific language impairment, focal brain injury, retardation, and autism). (Credit may not be received for both Psychology 176 and Cognitive Science 154.) *Prerequisites: Cognitive Science 10, 11 or Psychology 101 or Cognitive Science 101AB or Psychology 101AB or Psychology 145 or Psychology 105 or Psychology 2 and 3.*

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.*

173. Neurobiology of Plasticity and Comparative Cognition (4)
Advanced study of the neurobiology of brain systems that underlie learning, memory, and complex brain functions. Both theoretical (modeling) and empirical approaches used to explore these processes will be examined. Descriptions will be placed within the broad context of evolutionary biology. *Prerequisites: Cognitive Science 17 and 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 or Psychology 176; 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 108C and its prerequisites.*

182. Artificial Intelligence Modeling II (4)
The course is an advanced study of artificial intelligence models of control and representation. (Course previously offered as Cognitive Science 108D.) *Prerequisites: Cognitive Science 108B and its prerequisites.*

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 non-living systems. Coursework includes computer simulations of artificial lifeforms. *Prerequisite: Cognitive Science 18, CSE 62 or 65, or equivalent.*

187. 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 first hand experience with the problems of visualization. No programming skills are presupposed but we do assume a strong familiarity with computer software.

190A-B-C. Projects in Cognitive Science (4-4-4)
This independent study sequence is for advanced students who wish to undertake a two- or three-quarter reading or research project under the mentorship of a department faculty member. Students should contact faculty whose research interests them to discuss possible projects. *Prerequisites: upper-division standing; instructor and department approval.*

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. *Prerequisite: 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 and grade papers and exams. Applications must be submitted to and approved by the department. *Prerequisites: upper-division standing; 3.0 GPA; instructor and department approval.*

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 (1-4)
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.)

201A. Foundations of Cognitive Science: Neuroanatomy and Neurophysiology (4)
This course is a rigorous introduction to the neurophysiological and neuroanatomical basis of human and animal cognition, covering cellular neurophysiology and local circuits; development; the visual, somatosensory, auditory, motor, and limbic systems; and the evolution of language.

201B. Foundations of Cognitive Science: Interaction of Internal and External Representation (4)
The course addresses the interplay between natural and artificial internal and external representations as products of socially organized and distributed cognitive-behavioral ecologies that facilitate and constrain problem solving and the transfer of knowledge across generations.

201C. Foundations of Cognitive Science: Artificial Intelligence (4)
This course provides a theoretical introduction to the representations and methods of artificial intelligence. Emphasis is on logical, classical, and "situated" models to understand cognition. Topics include nonmonotonic logic, production systems, frame-based representations, mobotics, and the Marr approach to vision.

201D. Foundations of Cognitive Science: Language (4)
This course provides an overview of major theoretical issues in the study of language from the cognitive science point of view: linguistic representation, linguistic description, language processing and learning, and computational consequences of theoretical assumptions about the nature of language.

201E. Foundations of Cognitive Science: Modeling Human Information Processing (4)
In this course we will review some fundamental human information processing phenomena, collect data, and use nonlinear optimization techniques to fit simple mathematical models. Emphasis will be on models that could guide the implementation of synthetic systems based on human information processing principles.

201F. Foundations of Cognitive Science: Neural Networks (4)
This course introduces the use of neural networks (connectionist) models to understand cognitive phenomena. Topics include principles of network computation, network learning, the basis for generalization, nature of representation, a comparison with traditional cognitive models, and practical aspects of simulations.

201G. Foundations of Cognitive Science: Cognitive Neuroscience (4)
This seminar surveys current research investigating the neural systems important in attention, language, memory, and object recognition. Factors important in their development and several different experimental approaches employed in their study are also considered.

203A-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.

204A-B. Research Methods in Cognitive Science (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.

212. Mechanisms of Learning and Cognition (4)
This course explores the behavior and mechanisms that underlie a cognitive process from acquisition to expert perfor-

mance. The emphasis is on the computational mechanisms required to learn skilled performance. Topics vary by quarter, e.g., implicit learning, speech recognition, and mathematic word-problem solving.

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.)

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.

241. Ethics and Survival Skills in Academia (2-4)
This course will cover ethical issues which arise in academia, including: dishonesty, plagiarism, attribution, sexual misconduct, correcting errors, political activity, dealing with collaborators, etc. We will also discuss 'survival' issues, including job hunting, grant preparation, journal reviews, writing letters of recommendation, mentoring, etc. This course is open to students from any deparment.

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.

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.

260. Seminar on Special Topics (1-4)
Specific topics in cognitive science are discussed. (May be repeated when topics vary.)

270A-B-C. Seminar in Cognitive Neuroscience (2-2-2)
This year-long seminar will provide a broad overview of the emerging field of cognitive neuroscience: the multidisciplinary study of the neural bases of higher cognitive functions, including perception and attention, sensory plasticity, learning and memory, cerebral specialization, and language.

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.

283. Evaluating Cognitive Models (4)
Computer models bear a variety of relationships to cognitive evidence, from descriptive statements to detailed, working process models. This course explores the theory and practice of computer simulation through readings and hands-on experiences by developing and evaluating models of cognitive processes.

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.*

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.

Communication

OFFICE: 127 Media Center Communication Building, Marshall College
(619) 534-4410

Professors

Michael Cole, Ph.D.
Yrjö Engeström, Ph.D.
Dee Dee Halleck
Daniel Hallin, Ph.D., *Chair*
Helene Keyssar, Ph.D.
Chandra Mukerji, Ph.D.
Herbert I. Schiller, Ph.D., *Emeritus*
Michael Schudson, Ph.D.
Ellen Seiter, Ph.D.

Associate Professors

Susan G. Davis, Ph.D.
Daniel Hallin, Ph.D.
Robert Horwitz, Ph.D.
Carol Padden, Ph.D.
Vicente Rafael, Ph.D.
Daniel Schiller, Ph.D.

Assistant Professors

Philip E. Agre, Ph.D.
Valerie Hartouni, Ph.D.
Olga A. Vasquez, Ph.D.

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, 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.

We recommend that students interested in film and video production review requirements for the media production major offered through the Department of Visual Arts. We suggest that students who wish to develop their writing abilities review the listing for the literature/writing major and minor offered through the Department of Literature.

Within the communication department 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

*Com/Gen 20: Introduction to Communication
Com/Gen 21: Methods of Media Production

Upper Division

*Com/SF 100: Introduction to Communication as a Social Force

*Com/Cul 100: Introduction to Communication and Culture

*Com/HIP 100: Introduction to Communication and Human Information Processing

*Com/Gen 150: Senior Seminar in Communication

One media methods course: (to be selected from any communication course numbered 101–119)

Three courses beyond the introductory courses: (one must be chosen from each of the categories: Com/SF, Com/Cul, and Com/HIP)

Six upper-division communication electives

*These courses must be taken at UCSD.

Residency Requirement

Com/Gen 20, Com/Cul 100, Com/HIP 100, Com/SF 100, and Com/Gen 150 must be taken at UCSD. Students must take at least ten classes of their overall major requirements at UCSD.

Requirements for the Communication Minor

(Effective Fall 1987)

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 six courses in communication as follows:

*Com/Gen 20 (Introduction to Communication)
Two courses of your choice from the following:

*Com/SF 100 (Introduction to Communication as a Social Force)

*Com/Cul 100 (Introduction to Communication and Culture)

*Com/HIP 100 (Introduction to Communication and Human Information Processing)

Three upper-division communication electives within the areas of the chosen 100 classes.

Note: Com/Gen 100, Com/Gen 150, 197, 198, and 199 may not be used as electives within the minor.

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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), 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. Communication 200A-B-C (Introduction to the Theory of Communication as a Social Force, Communication and Culture, and Communication and the Individual).
2. Communication 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. Communication 280, Advanced Workshop in Communication Media.
6. Communication 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 and in some second mode of communication. This second mode of communicative proficiency may be an additional language, a computer language, statistics, or demonstrated ability to work in a medium of communication other than speaking and writing (e.g., photography, film, dramatic production, or video).
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.
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:
Susan Davis

Faculty Undergraduate Adviser:
Carol Padden

Undergraduate Coordinators:
Bea Velasco
Jamie Lloyd

Graduate Coordinator:
Jamie Lloyd

COURSES

LOWER-DIVISION

General Communication

Com/Gen 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.

Com/Gen 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 Com/Gen 21 is required to obtain a "media card."

UPPER-DIVISION

Communication as a Social Force

(Media methods courses are numbered 101-119.)

Com/SF 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: Com/Gen 20.*

Com/SF 101A. 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. *Prerequisites: Com/SF 100 and Com/Gen 21 or consent of instructor.*

Com/SF 101B. 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 style 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: Com/SF 101A or consent of instructor.*

Com/SF 101C. Television as a Social Force (6)
Students will conduct simple field research and then make a series of documentary video tapes to present research in a television format. *Prerequisite: Com/SF 101B or consent of instructor.*

Com/SF 120. The Transformation of Global Communications (4)
The information revolution has dramatically altered the telecommunications and information technologies and services which constitute the infrastructural nervous system of all international economic activity. This course is an introduction to the technical and market changes driving the emergence of a global information economy. Topics include the rise and decline of regulatory consensus; the development of new systems, services and markets; the growth of intangible, network-based transactions; the restructuring of corporate production and products; and the emergence of new international issues and conflicts. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 121. National Policies in Global Communications (4)
This course examines national policy responses to the transition to a global information economy. Topics include theories of the state and policymaking; and international telecommunication and information policies in the industized, developing, and communist countries. *Prerequisite: Com/SF 100, Com/SF 120, or consent of instructor.*

Com/SF 122. Multinational Policies in Global Communications (4)
This course examines the adaptation of international regulatory institutions negotiated by governments to the transition

to a global information economy. Topics include the political economy of regime cooperation on telecommunications, satellite systems, radio frequency allocations, transborder data flows, and trade in services. *Prerequisite: Com/SF 100 or Com/SF 120.*

Com/SF 124A-B. Public Opinion and Political Ideology (4-4)
The structure, origins, and dynamics of public opinion and political ideology. Comm/SF 124A considers the nature of public opinion and the factors that shape the development of political ideas–economic interests, psychological functions, political communication and organization, etc. Comm/SF 124B examines the development of political ideas in specific historical situations. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 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: Com/SF 100 or consent of instructor.*

Com/SF 128. Information Technology: Culture, Society, Politics (4)
A survey of recent developments in telecommunications, computer, and information technologies, and the social impact of their melding into a new industrial complex. The examination will be situated within the debates over the so-called post-industrial society. The impact of information technology on industry, work, stratification, politics, and culture will be considered. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 132. History of U.S. Political Communication (4)
Survey of the history of political communication in the United States from the colonial period to the present. Students will work on term papers in which they will undertake original historical research. *Prerequisites: communication major, Com/SF 100, or consent of instructor.*

Com/SF 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. *Perequisites: 139A - SF100 or PS 40 or consent of instructor. 139B - SF 100 or PS 40, SF 139A preferred.*

Com/SF 140. Comparative Media Systems (4)
Analysis of differing forms of organizations of the mass media in different societies, and their implications for politics and culture. Special attention to current debates over commercialization v. public ownership of the media. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 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 telegraph. 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. A research paper is required. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 148. Computers, Work, and Society (4)
This course explores new ways in which information technology is used to reorganize the work place and its social impact. Examines different approaches to organizing work both historically and today, the social forces affecting technological development, and the economic forces reshaping industry and labor. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 171A-B. American News Media (4-4)
(Same as Sociology 165 and Pol. Sci. 102I.) 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: Com/SF 100 for Com/SF 171A; Com/SF 171A is required for Com/SF 171B.*

Com/SF 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. May be repeated for credit three times. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 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: Com/SF 100 or consent of instructor.*

Com/SF 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: Com/SF 100 or consent of instructor.*

Com/SF 183. History of Communication Technologies (4)
A historical survey of the relationship of communication technology, mind, and society. If communication technologies are artifactual extensions of the human mind, their history may be traced back at least to the origins of writing. The course, organized chronologically, will in different years take up different technologies among writing, printing, telephone and telegraph, film, broadcasting, and computers. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 184. Media Analysis (4)
A systematic study of the means of contemporary information processing in the advanced industrial state. Institutional approaches to and empirical studies of the processing of information will be explored. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 185. History of Book Publishing (4)
This course will cover the history of book publishing from the development of printing in the fifteenth century to the present. Subjects covered will include the relative roles of (1) technology, (2) the organization of the publishing business, (3) the structure of the book trade, and (4) the activities of individual editors and publishers in shaping book production. *Prerequisite: Com/SF 100 or consent of instructor.*

Com/SF 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: Com/SF 100 or consent of instructor.*

Com/SF 190. The Information Commodity (4)
Examination of major social institutions and processes of information production and distribution. Explores the growth of import of wage labor and market structures across unevenly developing corporate and governmental information sectors. New media and nontraditional information providers are stressed. *Prerequisite: Com/SF 100, upper-division SF class, or consent of instructor.*

Communication and Culture

(Media methods courses are numbered 101–119.)

Com/Cul 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: Com/Gen 20 or consent of instructor.*

Com/Cul 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 (1) participation in measurement and analysis of stereotype presentations, and (2) investigating techniques for assessing both cognitive and behavioral effects of such scripted presentations on the users of media. *Prerequisites: Com/Cul 100 and Com/Gen 21 or consent of instructor.*

Com/Cul 106. Feminist Video Workshop (6)
This course explores the relationship between dramatic production and theory in a feminist context. Examination of such questions as the nature of collaboration, gender as an aspect of role identity, and sexual codes of behavior. This class will create an ensemble, a live dramatic production, and collaborate on a video production. *Prerequisites: Com/Gen 21 and Com/Cul 100 or consent of instructor.*

Com/Cul 108. Images of Women (4)
An analysis of American stereotypes of women and their use in media images. Student involvement includes (1) reviewing literature on the sociology of sex-roles, (2) developing media portraits of women to serve as data for class analysis, and (3) writing final paper on the stereotypes employed in generating these portraits. *Prerequisite: Com/Cul 100 or consent of instructor.*

Com/Cul 112. 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: Com/Cul 100 and Com/SF 171A (may be taken concurrently).*

Com/Cul 113. Theatre Text to Media Performance (6)
This course will explore the relationships between theatre performance and video and film production of dramatic texts as communication. Beginning with a case study of one dramatic score and moving to a variety of short dramatic pieces, students will be expected to apply both creative and critical skills to scene study for theatre and film. This course will include consideration of such elements as space, pacing, continuity,

choice and preparation of materials, improvisations and relationship to the audience. Students may emphasize one area, such as acting, dramaturgy or camera work, but all members of the class will take on at least two different performance-production tasks during the course. Seminar and workshop format. *Prerequisites: Com/Cul 100 (Com/Gen 21 strongly recommended) or consent of instructor.*

Com/Cul 116. Feminist Theatre Workshop (6)
This course explores the relationship between dramatic production and theory in a feminist context. Examination of such questions as the nature of collaboration, gender as an aspect of role identity, sexual codes of behavior. This class will create, as an ensemble, a live dramatic production of feminist drama and collaborate on a video production. *Prerequisites: Com/Cul 100, Com/Gen 21. Majors only or consent of instructor.*

Com/Cul 118. Oral History (4)
Theories, questions, cases, and methods in oral history will be introduced through readings, lectures, and concrete practice in oral historical research. Topics will include the relationship between oral history and official history; oral history and social history, voices and stances of the speaker, stances of the ethnographer and politics of editing; recording and presenting of texts; what is social speech in the individual. *Prerequisite: Com/Cul 100, Com/Cul 127 or 128, or work in folk literature or history, or consent of the instructor.*

Com/Cul 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: Com/Cul 100 or consent of the instructor.*

Com/Cul 121. 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/Cul 100 or consent of the instructor.*

Com/Cul 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: Com/Cul 100 or consent of instructor.*

Com/Cul 126. Gender and Film (4)
This course examines the work of women filmmakers from the beginnings of cinema to the present, and offers a basic introduction to feminist film theory. It focuses on the cinematic representation of women, masculinity and patriarchy, narrative and experimental strategies used by women filmmakers, and the role of the female spectator. *Prerequisite: Com/Cul 100 or consent of the instructor.*

Com/Cul 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: Com/Cul 100 or consent of the instructor.*

Com/Cul 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: Com/Cul 100 or consent of the instructor.*

Com/Cul 129. Ritual to Spectacle (4)
This course examines a broad range of public celebrations as communication. The general task is to define celebration and examine how and what it communicates. Specifically, how is celebration different from, and yet related to, other kinds of communicative events and media? Examples range from local festivals to national mass-mediated spectacles. *Prerequisites: completion of pre-major, Com/Cul 100. Majors only or consent of instructor.*

Com/Cul 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: Com/Cul 100 or consent of the instructor.*

Com/Cul 133. Work, Culture, and Communication (4)
This course introduces the notion that labor and communication are conjoined social forces which powerfully determine culture and society. We will explore this conjunction and its relationship to society using materials and ideas drawn from mass communication research, labor history, anthropology, sociology, literature, and folklore. Topics will include the history of the shift to industrial production as a reorganization of work as a communication medium, industrial folklore and work culture, changing images of work and workers, scientific management as control of social communication, the role of communication technologies on workplaces and work processes. *Prerequisite: Com/Cul 100 or consent of the instructor.*

Com/Cul 134. Communication, Politics, and Citizenship in America (4)
(Same as Poli. Sci. 113A) The citizen, free enough and informed enough to make political choices, supported by democratic social institutions and representative political institutions, lies at the heart of democratic theory. But who is entitled to be a citizen? Are citizens adequately informed? Do social and political institutions make possible or stand in the way of their ability to express their needs and interests? This course will examine these questions, and changing theoretical and practical answers to them, from colonial times to the present. *Prerequisite: upper-division standing.*

Com/Cul 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: Com/Cul 100 or Women's Studies 2A, B, or C.*

Com/Cul 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.*

Com/Cul 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: Com/Cul 137 or Women's Studies 2A, B, or C.*

Com/Cul 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: Com/Gen 20 or consent of the instructor.*

Com/Cul 144. Language and Society (4)
This course deals with the socioeconomic forces affecting the evolution of standardization of language, bilingualism, diglossia, and language maintenance. These processes are studied particularly in relation to the Spanish and English language in the United States. *Prerequisite: Com/Cul 100 or consent of instructor.*

Com/Cul 146. Culture and Thought (4)
(Same as Psych. 146.) An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Historical records, anthropological field reports, and experiments will be examined for the senses in which they are relevant to understanding presumed relations between culture and thought. Particular emphasis will be placed on the kinds of conclusions that can be supported by different kinds of data and on the shifting meaning of basic terms when one surveys different areas of research on this topic. *Prerequisite: Com/Cul 100 or Com/HIP 100.*

Com/Cul 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: Com/Cul 100 or consent of instructor.*

Com/Cul 150. Critical Theory (4)
In this course we will consider critical theories of politics, power, society, and discourse emerging from and addressing the second part of the twentieth century. Our focus will be Euro-American and our project, to theorize "capitalize-disciplinary" society and its production of subjects. *Prerequisite: Com/Cul 100 or consent of instructor.*

Com/Cul 150G. Sound and Image (4)
This course will explore the structure and strategies of oral and visual representations, in particular as they are organized into systems of meaning in film, television, and photography. Changes in the nature and function of imaging over time as well as interrelationships of sound and visual image will be explored. Narrative and point of view will be key concerns. *Prerequisite: Com/Cul 100 or consent of instructor.*

Com/Cul 160. Visual Knowledge (4)
(Same as Sociol. 173.) This course reviews ways that visual imagery contributes to our understanding of the world around us and ourselves. Students will consider uses of visual images in science, the mass media, and everyday life. *Prerequisite: Com/Gen 20 or Soc. 1A or consent of instructor.*

Com/Cul 161. Material Culture: Design and Social Process (4)
(Same as Sociol. 176.) 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: Com/Gen 20 or Soc. 1A or consent of instructor.*

Com/Cul 162. Popular Culture (4)
(Same as Sociol. 162.) 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: Com/Gen 20 or Soc. 1A or consent of instructor.*

Com/Cul 170. Advertising and Society (4)
(Same as Sociol. 164.) 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: Com/Cul 100 or consent of instructor.*

Com/Cul 174. Persuasion and Society (4)
(Same as Sociol. 164J.) What is the role of messages intentionally designed to be persuasive in society? How are messages crafted, and what impact do they have? Specific domains of persuasive communication to be examined will vary from year to year, but will typically include commercial advertising, public information campaigns, propaganda, public relations, and schooling. This course integrates research from sociology, social psychology, rhetoric, and communication. *Prerequisite: upper-division standing or consent of instructor.*

Com/Cul 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. May be repeated for credit three times. *Prerequisite: Com/Cul 100 or consent of instructor.*

Com/Cul 179. Colonialism and Culture (4)
(Same as ETHN 144.) 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.*

Com/Cul 180. Cultures and Markets (4)
What is the relationship between "culture"–those conventions that anchor ideas and practices about self and society–and the "market"–the site of exchange and the restless circulation of social energy? This course will introduce students to the symbolic and practical import of commodities in shaping everyday life. Students will be expected to do the assigned readings and keep ethnographic accounts of the cultures that have grown around the sites of market transactions, e.g., shopping malls, corporate offices, network t.v., etc. They are also expected to write a paper integrating the readings with their ethnographic materials. *Prerequisite: Com/Cul 100 or consent of instructor.*

Communication and Human Information Processing

(Media methods courses are numbered 101–119.)

Com/HIP 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: Com/Gen 20 or consent of instructor.*

Com/HIP 104A-B. Theory of the Production of Moving Images (4-4)
Complex messages, no matter what the content, generally provide clues for preferred interpretations. This course will explore the means by which such clueing is done in film/video. Students will focus on the relationship between the viewer and the maker of moving images through viewing and analysis, theoretical readings, and their own scripting and film/video production. *Prerequisites: Com/HIP 100, Com/Gen 21, Com/SF 101A-B, or consent of instructor.*

Com/HIP 108. The Development of Communication in Children (4)
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: Com/HIP 100 or consent of the instructor.*

Com/HIP 110. Media Effects (4)
This course examines three major approaches to studying effects of media in individuals: survey studies, content analysis, and ethnographic description. Representative studies from each approach are analyzed and compared for types of questions and conclusions drawn. Social and historical influences on interpretation of effects research are also examined. Course requirements include a final project using one of the three approaches. *Prerequisite: Com/HIP 100 or consent of instructor.*

Com/HIP 111A-B-C. Communicating and Computers (4-4-4)
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. *Prerequisites: Com/HIP 100, communication major, or consent of instructor.*

Com/HIP 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.

Com/HIP 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: Com/HIP 100 or consent of instructor.*

Com/HIP 116. Practicum in Child Development (6)
(Same as Psych. 128.) This course is intended as a combined lecture and laboratory course for seniors in psychology and communication. Their backgrounds should consist of a solid foundation in general psychology or communication and human information processing. The course will meet for two hours a week of lectures and discussion. Students will be expected to spend four hours of supervised practical experience in a field setting involving children. An additional six hours of student time will be devoted for reading, transcribing field notes, and writing a paper on some aspect of the field work experience as it relates to class lectures and readings. Evaluation of the course will be based on performance in classroom discussion, the judged quality of the students' fieldwork, and the quality of the term paper. *Prerequisite: Com/HIP 100 or consent of instructor. May be repeated three times for credit.*

Com/HIP 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. *Prerequisites: Com/HIP 100 and Com/Gen 21 or consent of instructor.*

Com/HIP 121. Literacy, Social Organization, and the Individual (4)
(Same as Psych. 173.) 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: Com/HIP 100 or Com/Cul 100 or consent of instructor.*

Com/HIP 122. Communication and the Community (4-4)
This course examines various forms of communication that affect people's everyday lives. Focusing on ways that ethnic communities transmit and acquire information, and interact with mainstream institutions, we examine a variety of alternative local media, including murals, graffiti, newsletters, and community radio. *Prerequisite: Com/HIP 100 or consent of instructor.*

Com/HIP 123. Children and Media (4)
(Same as Psych. 182.) A lecture course which analyses the influence of media on children's behavior and thought processes. The course takes an historical perspective, beginning with children's print literature, and encompasses movies, music, television, and computers. The focus of the course is analytical; students will study specific examples of media products intended for children and apply various analytical techniques including content analysis and experimentation to these materials. *Prerequisite: Com/HIP 100 or consent of instructor.*

Com/HIP 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: Com/HIP 100 or consent of instructor.*

Com/HIP 143. The Psychology of the Filmic Text (4)
(Same as Psych. 174.) 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: Com/HIP 100 or consent of instructor.*

Com/HIP 154. Pornography (4)
This course will review recent public debate on violence and pornography and the role of mass media. Following a review of media effects research in the area of violence and pornography, class topics will turn to issues of politics of effects research and social interpretation of effects research. Principal documents such as the Report of the Commission on Obscenity and Pornography (1970), the Report of the Attorney General's Commission on Pornography (1936), and court decisions on civil ordinances prohibiting depiction of violence against women will provide the basis for discussions. *Prerequisite: Com/HIP 100 or consent of instructor.*

Com/HIP 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: Com/HIP 100 or consent of the instructor.*

General Communication

Com/Gen 100. Introduction to Media Use in Communication (4)
Students will develop projects that will help them explore theories of communication by using communication media. Students with "media cards" can use film and/or video for these projects, but not all students will be required to do so. They can use computers, pen and paper, photography, posters or create parades and/or other performances. The purpose of the course is to link theory to concrete manipulation of any communication form. *Prerequisites: Com/Gen 20 and Com/Gen 21.*

Com/Gen 110. Media Methods for Communication Research (4)
Students will apply media knowledge and experience to research issues in documentation, analysis-methodology, experimentation, etc., through projects currently being conducted by faculty members. Each student will select a particular faculty member to work with. Students and faculty will participate in a weekly seminar meeting where issues, ideas, problems, and media methods relevant to research will be discussed. During the quarter each student will make a presentation to the seminar of the research project with which he or she is associated, and will prepare a final paper describing the research objectives through the projects, and his or her findings and conclusions. May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100 and Com/Gen 21, or consent of instructor.*

Com/Gen 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: Communication majors only, senior standing.*

Com/Gen 175. Advanced Topics in Communication: General (4)
Specialized study in communication: General with topics to be determined by the instructor in any given quarter. May be repeated for credit three times. *Prerequisite: Com/Gen 100 or consent of instructor.*

Com/Gen 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.*

Com/Gen 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

Com 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.

Com 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.

Com 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.

Com 201A. Experimental Designs and Methods (4)
This course will familiarize students with a variety of experimental strategies used to study the process and products of communication. The conduct of two small experimental projects will be combined with reading and critique of classic experiments in the field.

Com 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. *Prerequisite: graduate standing or consent of instructor.*

Com 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. *Prerequisite: graduate standing or consent of instructor.*

Com 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.

Com 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.

Com 201F. Textual Analysis (4)
Students will explore the theoretical stakes and methodological implications of a range of contemporary critical reading practices including but not limited to psychoanalysis, literary criticism, deconstruction, and film theory. Readings will be drawing from the works of Lacan, Foucault, Irigaray, Derrida, Bahktin, Eco, de Lauretis, White, and Barthes.

Com 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. *Prerequisite: graduate standing or consent of instructor.*

Com 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.

Com 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.

Com/Grad 212. Enlightenment and Counter-Enlightenment Traditions in Communication Research (4)
The course investigates the enlightenment concepts of rationality, subjectivity, power, and truth and examines the anti-enlightenment attack on these concepts. The aim of the course is to provide students the opportunity to read key works in Western social and political theory, and to understand how these underlie and shape different theoretical-methodological agendas in contemporary communications research. *Prerequisite: graduate standing or consent of instructor.*

Com 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.

Com 216. Research Problems in Global Communications (4)
Despite the importance of telecommunications and information industries and policies in contemporary world politics, there remains a dearth of sophisticated, theoretically informed academic research on these subjects. This course provides graduate students with a multidisciplinary introduction to the field

and attempts to delineate research strategies for doctoral work. Topics include theories of comparative and international policy making and political economy, and their application to numerous issues in global communications and information. *Prerequisite: graduate standing or consent of instructor.*

Com 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.

Com/Grad 222. Modern Childhood (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. *Prerequisite: graduate standing or consent of the instructor.*

Com 230. Media Production: Access and Control (4)
This course will engage students in planning and executing a video production. At each step, from conceiving an idea to seeking funding for production to interacting with people and institutions during production to editing to seeking broadcast access, the course will examine the politics of video production or, if you will, the "micro-politics" that influence and constrain production and its dissemination.

Com 232. History of U.S. Political Communication (4)
Survey of the history of political communication in the United States from the colonial period to present. Students will work on term papers in which they will undertake original historical research.

Com 235. Culture and Ideology (4)
This course will examine the concept of culture from a variety of viewpoints in the social sciences and humanities: 1) culture as conceived of as a "style" of a person, group, or class; 2) culture as a cognitive system or framework of perception–culture as class rule or as preconscious constraints on thoughts; and 3) culture as the artifacts produced by societies or social organizations–culture as industrial construction or as professional construction.

Com 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.

Com 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.

Com 250. Sound and Image (4)
This course will explore the structure and strategies of oral and visual representations, in particular as they are organized into systems of meaning in film, television, and photography. Changes in the nature and function of imaging over time as well as the interrelationship of sound and visual image will be explored. Narrative and point of view will be key concerns.

Com 261. Advanced Seminar in 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. *Prerequisite: graduate standing or consent of instructor.*

Com 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.

Com 271A. The News Media (4)
Theories and methods in the study of news, both print and broadcast. Topics include the political economy of news, the social organization of news institutions, and news as a cultural form. The course will normally concentrate on U.S. news media but comparative studies will also be examined. *Prerequisite: graduate standing or consent of instructor.*

Com 275. Topics in Communication (4)
Specialized study in communication, with topics to be determined by the instructor for any given quarter. *Prerequisite: graduate standing or consent of instructor.*

Com 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 video production, a coordinated photographic essay or exhibit, a computer instructional game, a published newspaper or magazine article directed at a special audience, a theatrical presentation, or some form other than those mentioned. May be repeated for credit six times.

Com 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.

Com 296. Communication Research as an Interdisciplinary Activity (4)
A course oriented toward a re-analysis of communication as a discipline. The content of this course is to provide the student with as well-integrated a framework as possible for initiating strong communication research in the dissertation.

Com 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.

Com 299. Independent Graduate Study (1-12)
Advanced independent study in communication under the guidance of Department of Communication faculty.

Com 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. *Prerequisites: graduate standing and consent of instructor.*

Comparative Studies in Language, Society, and Culture

OFFICE: 3354 Literature Building
(619) 534-3826/(619) 534-3217

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, and under guidance of an interdepartmental committee, are given the opportunity to design strongly interdisciplinary curricula, on the basis of which they write their dissertations. The program requires that the student be admitted and fundamentally trained in one discipline and that he or she undertake M.A.-level studies in an integrally related discipline or culture area. The qualifying examination will cover the whole of the student's studies, although its structure will be that designed by the department in which the student is fundamentally trained.

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 work will be under the supervision of an interdisciplinary committee, which will conduct the examination for Ph.D. candidacy, approve all study and research plans including the dissertation proposal, and forward them to the Graduate Council for final approval. The degree granted will indicate in its title the precise nature of the student's studies and research–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. 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 departmental adviser, direct inquiries to the chairperson of the program.

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 eight years.

Computer Science and Engineering (CSE)

See Engineering, School of.

Contemporary Black Arts Program

OFFICE: Sequoyah Hall, Room 132

Director

Cecil Lytle, B.A.

Faculty

Ken Anderson, *Visiting Lecturer, Music*
Robert Cancel, *Associate Professor, Literature*
Frances Foster, Ph.D., *Professor, Literature*
Floyd Gaffney, Ph.D., *Professor Emeritus, Theatre*
Sandra Foster-King, M.F.A., *Visiting Lecturer, Theatre*
Cecil Lytle, B.A., *Professor, Music*
Faith Ringgold, M.A., *Professor, Visual Arts*
Julie Saville, Ph.D., *Assistant Professor, History*
Quincy Troupe, *Professor, Literature*
Sherley Anne Williams, M.A., *Professor, Literature*

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 who complete the minor must meet the following requirements:

1. A required core of the following three lecture courses:

Theatre/Hist 5. Introduction to Black Drama (4)

Literature/English 17. Introduction to Afro-American Literature (4)

Music 127A. Music of Black Americans (4)

2. A fourth lecture course selected from the following approved list:

Theatre/Hist 109. African Heritage in Contemporary Drama: African, Caribbean, and African American (4)

Literature/English 185. Themes in Afro-American Literature (4)

Literature/English 188. Contemporary Caribbean Literature (4)

Literature/English 148.

Literature/English 183.

Literature/English 184.

Literature/Writing 100. Beginning Fiction (4) (F,W,S)

Music 126. Introduction to Oral Music (4)

Music 127B. Music of Black Americans (4)

History/U.S. 135. Slavery and the Atlantic World (4)

History/U.S. 136. Slavery and Freedom in Nineteenth-Century U.S.: Images and Reality (4)

Literature/Writing 102. Poetry (4) (F,W,S)

Literature/Writing 120. Personal Narrative (4)

VA 1. Introduction to Art (4)

3. Completion of a total of eight units of performance courses selected from the following approved list:

Music 95G. Gospel Choir (2) (F,W,S)

Music 95J. Jazz Ensemble (2) (F,W,S)

Music 131. Jazz Improvisation (4) (F,W,S)

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.

Contemporary Issues

OFFICE: 2024 Humanities and Social Sciences Building, Muir College, (619) 534-3589

Director

Patrick J. Ledden, Ph.D.

In addition to the current offerings, the Contemporary Issues Program sponsors an environmental studies minor which draws upon the humanities as well as the natural and social sciences. For information please see "Environmental Studies" or come to the Muir Interdisciplinary Studies Office, 2024 HSS.

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 communication 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

181. Seminar in Medical Anthropology (4)
(Same as ANGN 191.) Advanced medical seminar examines theory and method in the analysis of studies and research projects through surveying the literature and clinical situations

(medical anthropology writings, medical grand rounds, epidemiology). *Prerequisites: upper-division standing; department approval required.*

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: Contemporary 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. (Offered fall quarter only.) (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.)

Dimensions of Culture

OFFICE: 132 Sequoyah Hall, Marshall College

Program Director

Fraser Cocks, Ph.D.

Associate Program Director

Susan MacDonald, Ph.D.

The Dimensions of Culture Program is a three-course sequence taught by senior faculty from the Departments of History, Political Science, Anthropology, Communication, Ethnic Studies, and Literature. This program provides an interdisciplinary issues-oriented exploration of American, Western, and non-Western culture.

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 traditional, contemporary, Western, and non-Western works as well as from 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, and film.

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.

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 age, class, ethnicity, race, gender, and sexuality as significant markers of differences among persons. Emphasizing American society, it explores the cultural understandings of diversity and the economic, moral, political, and other social 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, rights within the family, 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, and film. 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: 1516 Galbraith Hall, Revelle College
(See also "Scripps Institution of Oceanography.")

Professors

Jeffrey L. Bada, *Marine Chemistry*
Wolfgang H. Berger, *Oceanography*
James W. Hawkins, *Geology*
Myrl C. Hendershott, *Oceanography*
Nicholas D. Holland, *Marine Biology*
Miriam Kastner, *Geology*
Devendra Lal, *Nuclear Geophysics*
J. Douglas Macdougall, *Earth Sciences*
Kurt Marti, *Chemistry*
T. Guy Masters, *Geophysics*
Jean-Bernard H. Minster, *Geophysics*
Jason W. Phipps-Morgan, *Geophysics*
David T. Sandwell, *Marine Geophysics*
John G. Sclater, *Marine Geophysics*
Richard C.J. Somerville, *Meteorology*
Mark Thiemens, *Chemistry*
Martin Wahlen, *Geochemistry*
Edward L. Winterer, *Geology*

Associate Professors

Catherine G. Constable, *Geophysics*
Timothy D. Herbert, *Geology*

Assisstant Professors

Kevin M. Brown, *Geology*
Paterno A. Castillo, *Geology*
Christopher D. Charles, *Chemistry*
Wunchang Wei, *Oceanography*

Senior Lecturer

Steven C. Constable, *Geophysics*

Lecturers

Nicholas E. Graham, *Associate Research Meteorologist*
Alistair J. Harding, *Geophysics*
David P. Rogers, *Associate Research Meteorologist Oceanographer*

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 is intended to be a transition program to a proposed Department of Earth Sciences, to be implemented at UCSD at a future time. All current earth science faculty are members of the Scripps Institution of Oceanography and 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

Two earth sciences major programs are presently offered through the UCSD Interdisciplinary Earth Sciences Undergraduate Program. These are the *ES/Chemistry* and *ES/Physics* majors.

For both majors, lower-division requirements are designed to provide the foundations in mathematics, physics, and chemistry that are essential in modern quantitative earth sciences disciplines. In addition, two courses introducing the basic concepts of geology and geochemistry, ES 101 and ES 102, are required to provide the appropriate background for upper-division courses. Although ES 12 is not listed as a required course, students not familiar with basic ideas concerning the early Earth, the geological time scale, and the evolution of life are strongly encouraged to take this course as well.

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 courses in the earth sciences are offered as the SIO courses ES 198 and ES 199. These courses are subject to consent of the instructor and approval by the ES adviser. These courses 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.

ES/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 plantetary-scale changes on a broad range of time scales. Comparative planetology (i.e., comparisons with other bodies of the solar system) will be highlighted as a basic tool to improve our understanding of the Earth itself. The major is appropriate for students interested in modern geochemistry, in the space sciences approach to "global change" studies, and in global and local environmental problems, including biochemical and anthropogenic effects.

Lower-Division Requirements

The following courses must be taken for a letter grade:

1. Mathematics 20A, 20B, 20C, 20D or equivalent
2. Physics 2A, 2B, 2C, 2D
3. Chemistry 6A, 6B, 6C, 6BL
4. Earth Sciences courses which should be taken in the sophomore year:
   ES 101. Introduction to Geology
   ES 102. Introduction to Geochemistry

Please consult the Earth Sciences Office for specific changes to major requirements.

Upper-Division Requirements

The following courses must be taken for a letter grade:

1. Earth Sciences requirements:
   ES 103. Introduction to Geophysics
   ES 120. Mineralogy
   ES 162A. Introduction to Field Geology
   ES 162L. Laboratory Exercises in Field Geology
2. Chemistry requirements:
   Chemistry 120A. Inorganic Chemistry
   Chemistry 131. Physical Chemistry
   Chemistry 140A. Organic Chemistry
3. Chemistry restricted electives:
   at least 8 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

   up to 8 units from:
   Chemistry 120B, C. Inorganic Chemistry
   Chemistry 122. Biochemical Evolution
   Chemistry 149A, B. Environmental Geochemistry
   Chemistry 170. Cosmochemistry
   Chemistry 171. Nuclear Chemistry
   Chemistry 173. Atmospheric Chemistry
4. Earth Sciences restricted electives: at least 16 units selected from among the following courses must be passed with a 2.0 grade-point average and grades of C- or better:
   ES 130. Geodynamics of Terrestrial Planets
   ES 142. Atmospheric Chemistry
   ES 144. Isotope Geochemistry
   ES 152. Petrology and Petrography

ES 155. Geological Record of Planetary Evolution
ES 160. Tectonics and Structural Geology
SIO 226. Introduction to Marine Geophysics
SIO 240. Marine Geology
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.

A possible schedule yields:

FALL	WINTER	SPRING
JUNIOR YEAR		
Chem. 140A	Chem. 131	ES 103
Chem. Elect.	Chem. Elect.	ES Elect.
ES Elect.	ES 120	ES Elect.
SENIOR YEAR		
Chem. Elect.	Chem. Elect.	ES Elect.
ES Elect.	ES 162A	ES Elect.
—	ES 162L	—

ES/Physics Major

This specialization focuses on the mechanical, dynamical, and thermodynamical apsects 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.

Lower-Division Requirements

The requirements are essentially the same as for physics majors. The following courses must be taken for a letter grade:

1. Mathematics 20A, 20E, 20F or equivalent
2. Physics 4A-B-C-D-E, and 2CL-DL, or 2A-B-C-D and 2CL-DL. (The Physics 4 sequence is strongly recommended.)
3. Chemistry 6A, 6B, 6BL, or Chemistry 7A-B and 6BL
4. Earth Sciences courses which should be taken in the sophomore year:
   ES 101. Introduction to Geology
   ES 102. Introduction to Geochemistry

Please consult the Earth Sciences Office for specific changes to major requirements.

Upper-Division Requirements

The following courses must be taken for a letter grade:

1. Earth Sciences requirements:
   ES 103. Introduction to Geophysics
2. Physics requirements:
   Physics 100A-B-C. Electromagnetism
   Physics 110A-B. Mechanics
3. Physics restricted electives: minimum of 4 units selected from:
   Physics 121. Experimental Techniques
   Physics 140A, B. Statistical and Thermal Physics
   Physics 105. Computational Physics
   AMES 130A. Solid Mechanics I
   AMES 144A. Space Science and Engineering
4. Mathematics restricted electives: minimum of 8 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 16 units selected from among the following courses must be passed with a 2.0 grade-point average and grades of C– or better:
   ES 120. Mineralogy
   ES 130. Geodynamics of Terrestrial Planets
   ES 155. Geological Record of Planteary Evolution
   ES 160. Tectonics and Structural Geology
   ES 162A. Introduction to Field Geology
   ES 162L. Laboratory Exercises in Field Geology
   ES 180. Geophysics of Natural Resources
   ES 182. Field Geophysics
   SIO 223. Geophysical Data Analysis
   SIO 224. Physics of the Earth Interior
   SIO 226. Introduction to Marine Geophysics
   SIO 227. Advanced Seismology

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 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. 110
–	–	ES 103
SENIOR YEAR		
Phys. Elect.	–	ES Elect.
Math. Elect.	Math. Elect.	–
–	–	ES Elect.
ES 130	ES Elect.	–

[redacted]

A minor in Earth Sciences consists of three lower division courses, such as ES 10, ES 12, ES 20, ES 30, ES 40, and three upper division courses, focused on geology, geochemistry, or geophysics. Courses required by a student's major may not be applied toward a minor and neither can ES 198 or ES 199. Courses for the minor may be taken on a Pass/Not Pass basis if the student's college permits. The Warren College program of concentration is similar, but not identical to a minor.

[redacted]

Graduate degrees in the earth sciences are offered through the Scripps Institution of Oceanography Graduate Department. See listings under "Scripps Institution of Oceanography" for detailed information.

CO[redacted]ES

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 (1516 Galbraith Hall, (619) 534-8157) in order to obtain up-to-date information.

LOWER-DIVISION

ES 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. (W)

ES 12. History of the Earth and Evolution (4)
A geologist's view of the evolution of the Earth. We will consider the making of the Earth in the early solar system, the differentiation of the Earth's surface into continents and ocean basins, and how the planet became habitable. We will trace the evolution of life on the planet since its inception some 3 billion years ago. Particular attention will be devoted to the geologic record of climatic changes and extinctions, with an eye to the relevance of this record to future human-induced environmental shifts. Three-hour lecture. *Prerequisites: none.* SIO staff (F)

ES 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 Niño 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.* SIO staff (W)

ES 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.* SIO staff (F)

ES 40. Earth Sciences and the Environment (4)
A survey of Earth and environmental sciences as they deal with human's impact on the global environment and the availability of resources. Topics chosen may vary somewhat from year to year, but focus on the evidence for, and the dynamics of, global change from human activity. Resource limitations, climate modification, water cycle, ecological principles, and basic political and economic factors are discussed in the framework of global habitat modification, including large-scale extinction. W. Berger and SIO staff (S)

UPPER-DIVISION

ES 101. Introduction to Geology (5)
This introductory course traces the evolution of the Earth from its formation as a planet in the solar system to its present state. A broad range of subjects, from the effect of the atmosphere and weather on the Earth's surface to formation of mountain ranges and the ocean basins through plate tectonics helps create an awareness in students of the geologic environment in which they live. The course includes laboratory sections and several local field trips. *Prerequisites: one year each of college-level math, physics, and chemistry, or consent of instructor.* (F)

ES 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: ES 101, Chemistry 6A-B-C or equivalent, first-year Revelle, mathematics, and physics, or consent of instructor.* (W)

ES 103. Introduction to Geophysics (4)
An introduction to the use of physical measurements to determine the structure and composition of the solid Earth. Topics include an introduction to earthquake seismology, the gravity and magnetic fields, isoslasy, and elementary concepts in geodynamics. The course summarizes current knowledge of the interiors of the Earth as determined by modern geophysical techniques. *Prerequisites: Mathematics 20 or equivalent; Physics 2, ES 101; or consent of instructor.* SIO staff (S)

ES 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: ES 101, ES 102 (may be taken concurrently with ES 102).* (W)

ES 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: Mathematics 20 or equivalent; Physics 2, or consent of instructors. Minster, Phipps-Morgan, and SIO staff.* Offered in alternate years (not offered 1996–97). (F)

ES 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 radiatively important trace gases will be examined. *Prerequisites: Chemistry 6 sequence or equivalent.* (Offered 1996–97.) SIO staff. (S)

ES 144. 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: ES 101, ES 102, ES 120.* (Offered 1996–97.) (S)

ES 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: ES 101, ES 102, and ES 120 or their equivalents.* (S)

ES 155. Geological Record of Planetary Evolution (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: ES 152, or consent of instructors.* (F)

ES 160. Tectonics and Structural Geology (4)
The major structural features both large and small of the continents and oceans are introduced in terms of the theory of plate tectonics. The first half of the course will focus on the large-scale features associated with plate boundaries on the ocean floor and the continents. The second half will examine the detailed structure of these plate boundary regions at the map and outcrop level. *Prerequisites: ES 101, ES 103, or consent of instructor.* SIO staff. Offered in alternate years (Offered 1996–97.) (F)

ES 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: ES 101, ES 120, and ES 160 or consent of instructor. To be taken concurrently with ES 162L.* SIO staff (W)

ES 162L. Laboratory Exercises in Field Geology (2)
Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. *Prerequisites: ES 101, ES 120, ES 160, or consent of instructor. To be taken concurrently with ES 162A.* SIO staff. (W)

ES 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, including an introduction to geophysical inverse theory. *Prerequisites: Mathematics 20 sequence or equivalent, Physics 2 sequence. ES 182 can be taken concurrently, or consent of instructor.* (S)

ES 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: ES 180 (can both be taken concurrently) or consent of instructor.* (S)

ES 198. Directed Group Study (2–4)
This course covers a variety of directed group studies in areas not covered by formal ES courses (P/NP grades only.) *Prerequisite: consent of instructor.*

ES 199. Independent Study for Undergraduates (4)
Independent reading or research on a problem. By special arrangement with a faculty member. (P/NP grades only.)

Economics

OFFICE: 114 Economics Building

Professors

Richard Attiyeh, Ph.D., *Vice Chancellor for Research and Dean of Graduate Studies*
Donald V.T. Bear, Ph.D., *Emeritus*
John Conlisk, Ph.D.
Vincent Crawford, Ph.D., *Chair*
Robert F. Engle, Ph.D.
Clive W.J. Granger, Ph.D.
Theodore Groves, Ph.D.
James D. Hamilton, Ph.D., *Director of Graduate Studies*
Walter P. Heller, Ph.D.
Mark J. Machina, Ph.D.
Ramu Ramanathan, Ph.D., *Director of Undergraduate Studies*
Joel Sobel, Ph.D.
Ross Starr, Ph.D.
Halbert White, Ph.D.

Research Professor

Harry M. Markowitz, Ph.D.

Associate Professors

Richard Carson, Ph.D.
Marjorie Flavin, Ph.D.
Jose Luis Guasch, Ph.D.
Garey Ramey, Ph.D.
Valerie Ramey, Ph.D.
James Rauch, Ph.D.
Dennis Smallwood, Ph.D., *Emeritus*

Assistant Professors

Julian Betts, Ph.D.
Wouter J. Den Haan, Ph.D.
Graham Elliott, Ph.D.
Allan Timmermann, Ph.D.
Joel Watson, Ph.D.

Adjunct Professors

Lawrence Krause, Ph.D.
R. John McMillan, Ph.D.
Dale Squires, Ph.D.

Associated Faculty

Neal Beck, Ph.D.
Michael Bernstein, Ph.D.
Joseph Grunwald, Ph.D.
Takeo Hoshi, Ph.D.
Alex Kane, Ph.D.
Bruce Lehmann, Ph.D.

Economics is the study of how individuals, organizations, and societies deal with scarcity–the problem that available resources are not sufficient to satisfy everyone's wants. Because scarcity requires choice (frequently referred to as trade-off) among alternative uses of resources, economics involves both study of the technology by which resources are turned into the products people want and study of the preferences through which people choose among alternatives. Further, since society is composed of many individuals and groups, economics involves study of the institutions through which a society can 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 the problems.

Economics is a different discipline from business administration. However, there are substantial overlaps. Both disciplines study the behavior of individuals and business firms within the context of market, legal, and other institutions. Economists tend to emphasize the workings of the institutions from the viewpoint of the larger society. How well do the institutions serve the society? Business faculty tend to emphasize the workings of the institutions from the viewpoint of a business enterprise. How can an enterprise operate successfully within the institutions? Because the issues are closely related, there is substantial overlap between an economics major and a business administration major. However, they are definitely not the same. A fuller discussion is available in the department brochure (described in the next paragraph). The brochure compares a major in economics here at UCSD to a major in business administration at UC Berkeley.

Economics majors and minors are strongly encouraged to obtain a general campus personal student account by applying to Academic Computing Services Office, 1218 AP&M. After obtaining a personal account students must then register that account with the Department of Economics Undergraduate Coordinator (room Economics114) to get electronic mail messages from the department.

The department circulates an informational brochure for undergraduates. It is available from Room 114 of the Economics Building. The brochure answers questions frequently asked by students, gives practical tips for avoiding problems, and, in general, provides a more detailed discussion than is possible in this catalog. It is important for students contemplating a major in the department to be familiar with the brochure.

Lower-Division Economic Courses

A FIRST SURVEY COURSE—ECONOMICS 10

Economics 10 is an elementary and nontechnical survey of economic reasoning, with emphasis on applications to current events. The course uses only the simplest formal tools (simple equations and graphs). Several purposes are served by Economics 10–economic literacy for students who never take more economics, the first course of a two- or three-quarter sequence for students satisfying general-education requirements, and a starting point for students minoring or majoring in economics.

Economics 10 is recommended for most students who intend a minor or major in economics, however, students who have already taken a year or more of economics at the college level are viewed as having passed the level of Economics 10; hence they may not go back and take Economics 10 for credit.

MICROECONOMICS AND MACROECONOMICS—ECONOMICS 1A-B AND 2A-B

The department offers two micro-macro sequences, Economics 1A-1B and Economics 2A-2B. For each sequence, the A course introduces the analytical tools of micro-economics (the study of households, firms, and other "micro" agents). The B course introduces the analytical tools of macroeconomics (the study of the aggregate performance of an economy). The 1A-1B courses differ from the 2A-2B courses only in that the latter use calculus in

the presentation. Mathematics 1A-1B-1C or better is the prerequisite for Economics 2A-2B. Micro and macro courses may be taken in either order, or simultaneously. For example, 1B may be taken before, after, or simultaneously with 1A.

A micro-macro combination (such as Economics 1A-1B), or the equivalent from another institution, is required for upper-division work in economics.

Modern economics is somewhat mathematical, and calculus is a standard working tool. Therefore, there are educational advantages in taking the calculus track (Economics 2A-2B rather than Economics 1A-1B). Students who plan an economics or management science major, especially the latter, are well advised to take the calculus track. However, students who are unable to do so for scheduling or other reasons may be reassured by the fact that Economics 1A-1B satisfies the same requirements as Economics 2A-2B, and by the fact that the economic substance of 1A-1B is the same as for 2A-2B.

Because the substance is the same, it is acceptable to mix courses from the calculus and noncalculus tracks. That is, Economics 1A-2B or Economics 2A-1B are acceptable combinations. For the same reason, students should not take and will not receive credit for both 1A and 2A or for both 1B and 2B.

Computer-aided Methods in Economics and Management—Economics 60

In the last decade, there has been an explosion in the use of computers as tools for a variety of analyses of economic, statistical, and financial data. In particular, spreadsheets have become such an integral part of today's data analysis that it is essential that all students be adequately trained in their use. This course introduces students to a variety of basic concepts and methods in economics and business using spreadsheets on microcomputers as vehicles to illustrate the usefulness of those concepts. In addition, students will learn to work with the mainframe computers on campus and to communicate electronically with others. The course will thus be a valuable first step in acquiring computer literacy so important in today's job market. There are no prerequisites except for a working knowledge of high-school algebra and graphing techniques.

Students who have already taken principles courses in micro and macro economics will find the empirical aspects complementing the theory they learned. Others may find the concepts and empirical work interesting enough to learn economics in a more systematic way.

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 use as an optional part of an economics major or minor; and the courses is open to students who take no other courses from the department.

Upper-Division Economics Courses

The upper-division economics core courses are scheduled according to the academic calendar. The "A" and "C" courses are offered in fall. The "A" and "B" courses are offered in the winter. The "B" and "C" courses are offered in spring. The following economics core courses are sequential. That is "A" must be taken before "B".

Economics 100A-B
Economics 170A-B
Economics 120A-B

Economics 172A must be taken first. Economics 172B and 172C may be taken in either order.

Entry to the Majors

For several years, there were restrictions on entry to the majors. The restrictions were a response to extreme crowding. The crowding problem is now much reduced. Therefore, the entry restrictions have been lifted. Any student in good standing may declare a major in the department by filling out a form at the Office of the Registrar.

The Economics Major

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 1A-1B-1C or Mathematics 20A-2B-2C.
2. Lower-division economics. Economics 1A-1B, or 2A-2B or 1A-2B or 2A-1B.
3. Introductory statistics and computer use. Economics 60. (However, some students are exempt from this new requirement. Exempt students are those who first enrolled at UCSD prior to fall 1989, or who were enrolled at another college or university prior to fall 1989 and within three years of enrollment at UCSD, provided that the prior enrollment was not solely during high school and the first summer following high school.)
4. Upper-division core. Economics 100A-B (microeconomics), Economics 110A-B (macroeconomics), and Economics 120A-B (econometrics).
5. Upper-division electives. Six more economics courses at the upper-division level.

Majors are strongly encouraged to complete the lower-division requirements (1, 2, and 3) before beginning the upper-division requirements (4 and 5). Further, majors are strongly encouraged to take Economics 100A-B and either 110A-B or 120A-B 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
Mathematics 1A-B-C or Mathematics 20A-B-C*

SOPHOMORE YEAR
Economics 1A-B or Economics 2A-B
or Economics 10-1A-1B or Economics 10-2A-2B
Economics 60

JUNIOR YEAR
Economics 100A-B
Economics 110A-B
Economics 120A-B

SENIOR YEAR
Six Economics Electives

* Effective fall 1994, the Department of Mathematics is replacing the Mathematics 2 sequence with a new Mathematics 20 sequence.

Please refer to the Department of Mathematics catalog copy for a full description of the transition, including recommended entry points and retake substitutions. Please consult Economics Undergraduate Student Services (114 Economics Building) for specific changes to major requirements.

A fuller description of the economics major is contained in the brochure *Economics Curriculum*, available at Room 114 of the Economics Building.

The Management Science Major

Management science builds on a set of related quantitative methods for optimal allocation of scarce resources. The major introduces students to the structure of these techniques and their applications in both private and public enterprise. 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 2A-B, Economics 4, Mathematics 20A-B-C, Mathematics 20F*, and Economics 60. Economics 1A may be substituted for 2A, or 1B for 2B. However, 2A-B is recommended. 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. Eight of these are specified: Economics 170A-B (Management Science Microeconomics), Economics 120A-B (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 and 171 present techniques for analysis and decision-making under conditions of uncertainty. The 172 sequence provides a general survey of optimization techniques employed by management scientists.

Of the seven management science electives, at least one must be chosen from Economics 173 (Corporate Finance) or Economics 175 (Financial Investments). Two must be chosen from Economics 174 (Insurance, Economics, and Finance), Economics 175 (Financial Investments), Economics 176 (Marketing), Economics 177 (Topics in Operations Research), Economics 178 (Economic and Business Forecasting), or Economics 179 (Decisions in the Public Sector). Each of these courses focuses on an important set of managerial problems. The remaining four 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
Mathematics 20A-B-C*

SOPHOMORE YEAR
Economics 2A-B or 1A-B or
10-2A-2B or 10-1A-1B
Economics 4
Mathematics 20F*
Economics 60

JUNIOR YEAR
Economics 170A-B
Economics 120A-B
Economics 171
Economics 172A-B-C

SENIOR YEAR
Seven Economics Electives

* Effective fall 1994, the Department of Mathematics is replacing the Mathematics2 sequence with a new Mathematics20 sequence. Please refer to the Department of Mathematics' catalog copy for a full description of the transition, including recommended entry points and retake substitutions. Please consult Economics Undergraduate Student Services (114 Economics Building) for specific changes to major requirements.

A fuller description of the management science major is contained in the brochure *Economics Curriculum* available at Room 114 of the Economics Building.

The Quantitative Economics and Decision Sciences Major

The quantitative economics and decision sciences major, hereafter referred to as the "QEDS major," is a variant of an economics major. **This major is only available to students who entered UCSD prior to fall 1994.** Relative to the standard economics major described above, the QEDS major places less emphasis on macroeconomics and more emphasis on microeconomics. Within microeconomics, it places more emphasis on the theory of the firm and less on the theory of the household. It also places greater emphasis on mathematical and statistical tools through which microeconomic decisions can be analyzed.

A student majoring in QEDS must meet the following requirements.

1. Calculus and linear algebra. Mathematics 20ABC-20F.
2. Lower-division economics. Economics 2A-2B. Economics 1A may be substituted for 2A, or 1B for 2B. However, 2A-B is recommended.
3. Introductory statistics and computer use. Economics 60. (However, some students may elect instead to meet an older computer requirement. These are students who first enrolled at UCSD prior to fall 1989, or who were enrolled at another college or university prior to fall 1989 *and* within three years of enrollment at UCSD, provided that the prior enrollment was not solely during high school and the first summer following high school. The older requirement is to take one of the following programming courses: AMES 5, AMES 10, CSE 62A, CSE 65, Mathematics 71, Mathematics 77.)
4. Upper-division core. Economics 170A-B (microeconomics), Economics 120A-120B-171 (econometrics and decisions under uncertainty), and Economics 172A-B-C (operations research).
5. Upper-division electives. Seven upper-division economics courses. Two of the seven must be from the group Economics 175, 176, 177, 178, and 179.

The following schedule, though not the only possibility, is a well-constructed one for a student majoring in QEDS.

FRESHMAN YEAR
Mathematics 20A-B-C*

SOPHOMORE YEAR
Economics 2A-B or 10-2A-2B
Mathematics 20F*
Economics 60

JUNIOR YEAR
Economics 170A-B
Economics 120A-B
Economics 171
Economics 172A-B-C

SENIOR YEAR
Seven Economics Electives

* Effective fall 1994, the Department of Mathematics is replacing the Mathematics2 sequence with a new Mathematics20 sequence. Please refer to the Department of Mathematics' catalog copy for a full description of the transition, including recommended entry points and retake substitutions. Please consult Economics Undergraduate Student Services (114 Economics Building) for specific changes to major requirements.

A fuller description of the QEDS major is contained in the brochure *Economics Curriculum,* available at Room 114 of the Economics Building.

Honors

The requirements for departmental honors are described in the brochure *Economics Curriculum,* available at Room 114 of the Economics Building.

Grade Rules for Majors

All courses used in meeting requirements for an economics, Management Science, or a QEDS major must be taken on a letter-grade basis. (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.) These courses 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 they apply to courses taken from other departments (such as required mathematics courses).

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: *Requirements for economics or management science majors and minors:* If the AP score is 5, accept AP Micro (AP Macro) as equivalent to Economics1A (Economics1B) in meeting major or minor requirements. If the score is 3 or 4, the student is required to take Economics 1A or 2A (1B or 2B).

Minors and Programs of Concentration

The economics minor consists of six courses: an introductory microeconomics course (Economics 1A or 2A); an introductory macroeconomics course (Economics 1B or 2B); and four more economics courses. These four must include at least three upper-division courses, but the four are otherwise not restricted.

The Department of Economics introduces a **management science** minor, paralleling the existing economics minor. This minor will consist of an introductory micro course (Economics 1A or 2A,) an introductory macro course (Economics 1B or 2B,) Economics 4, and any three from the following list:

Economics 170A	Managerial Microeconomics
Economics 170B	Managerial Microeconomics
Economics 120A	Econometrics
Economics 120B	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 177	Topics in Operations Research
Economics 178	Economic and Business Forecasting
Economics 179	Decisions in the Public Sector

To declare an **economics or management science** minor, obtain a minor declaration form from your college advising office, fill it out, and turn it in at the department (Room 114.) Students should check with their colleges regarding area of focus, programs of concentration, and project minors.

[redacted]

The department offers the M.A., C.Phil., and Ph.D. degrees. However, a student must be admitted to the Ph.D. program in order to be eligible for an M.A. or C.Phil. The main Ph.D. requirements are that a student qualify in microeconomics, macroeconomics, econometrics and two advanced fields and that a student prepare an acceptable dissertation. A detailed description of the Ph.D. program is available by writing the director of graduate studies, care of the Department of Economics. 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.

COURSES

LOWER DIVISION

1A-B. Elements of Economics (4-4)
Basic methods of economic analysis and their application to public policy and current events. Economics 1A concerns microeconomics: supply and demand, markets, income distribution, perfect and imperfect competition, the rule of government. Economics 1B concerns macroeconomics: unemployment, inflation, business cycles, monetary and fiscal policy. Economics 1A is not required for 1B. Credit not allowed for both Economics 1A-B and Economics 2A-B.

2A-B. Introduction to Economics (4-4)
Same content as Economics 1A-B, but calculus is used in the presentation. 2A is not required for 2B. Credit not allowed for both Economics 1A-B and Economics 2A-B. *Prerequisites: Mathematics 1A-B-C.*

4. Financial Accounting (4)
Recording, organizing, and communicating economic information relating to business entities. *No prerequisites.*

10. Markets (4)
Emphasis on intuition and current events, markets and resource allocation, government intervention when markets fail (monopoly inequality, environmental issues), stock, bond, and other financial markets, inflation and unemployment, international markets. No credit for students with a year of previous college economics. *No prerequisites.*

60. Computer-Aided Methods in Economics and Management (4)
Descriptive statistics and computer analysis as a means of understanding economics and business data. Introduction to UNIX and MS-DOS operating systems, use of spreadsheets, histo-

grams, graphing, measures of location and dispersion, curve-fitting, index numbers. Applications to economics and finance. *No prerequisites.*

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-B. Microeconomics (4-4)
(Conjoined with Economics 100AH-BH.) Household and firm behavior as the foundations of demand and supply. Market structure and performance, income distribution, and welfare economics. Credit not allowed for both Economics 100A-B and Economics 170A-B. *Prerequisites: Economics 1A-B or 2A-B and Mathematics 1C.*

100AH-BH. Honors Microeconomics (4-4)
(Conjoined with Economics 100A-B.) Honors sequence covering the material of Economics 100A-B. *Prerequisite: department stamp required.*

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 2A-B. 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 and Mathematics20A-B-C.*

110A-B. Macroeconomics (4-4)
(Conjoined with Economics 110AH-BH.) The theory of national income determination as the basis for explaining fluctuations in income, employment, and the price level. Use of monetary and fiscal policy to stabilize the economy. *Prerequisites: Economics 1A-B or 2A-B and Mathematics1A-B-C or 20A-B-C.*

110AH-BH. Honors Macroeconomics (4-4)
(Conjoined with Economics 110A-B.) Honors sequence covering the material of Economics 110A-B. *Prerequisite: department stamp required.*

111. Monetary Economics (4)
Financial structure of the U.S. economy. Bank behavior. Monetary control. *Prerequisites: Economics 1A-B or 2A-B and Mathematics1A or 20A.*

112. Advanced Monetary Economics (4)
Sequel to Economics 111. *Prerequisite: Economics 111.*

113. Mathematical Economics (4)
Mathematical concepts and techniques used in advanced economic analysis; applications to selected aspects of economic theory. *Prerequisites: Mathematics20A-B-C and Economics 100A-B, or, Economics 170A-B, or, Mathematics140A or Mathematics142A.*

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 2A-B.*

117. Economic Growth (4)
Models of the economic growth of developed economies. *Prerequisites: Economics 1A-B or 2A-B and Mathematics1A-B-C or 20A-B-C.*

118A-B. Law and Economics (4-4)
Analysis of the economic effects of the structure of the law with particular emphasis on the law of liability, including liability for nuisances, zoning law, products liability, and accident liability. *Prerequisites: for 118A, Economics 1A-B or 2A-B; for 118B, 118A with a minimum grade of B and department stamp required.*

120A-B-C. Econometrics (4-4-4)
(Economics 120A-B conjoined with Economics 120AH-BH.) Probability and statistics used in economics. 120A covers probability and basic statistical methods. 120B covers regression and related methods. 120C covers more advanced methods and usually requires an independent empirical project. *Prerequisites: Economics 1A-B or 2A-B and Mathematics1A-B-C or 2A-B-C and Economics 60.* Credit not allowed for both Economics 120A and Mathematics 183. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions.

120AH-BH. Honors Econometrics (4-4)
(Conjoined with Economics 120A-B.) Honors sequence covering the material of Economics 120A-B. *Prerequisite: department stamp required.*

121. Applied Econometrics (4)
Application of econometric methods to such areas as labor supply, human capital, and financial time series. *Prerequisites: Economics 120A-B or 120AH-BH.*

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. Economics 120C and 178 are 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 2A-B.*

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 2A-B.*

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 2A-B.*

133. Housing Policy (4)
(Same as USP 123.) Examines housing markets and the U.S. housing finance system. Evaluates federal and local policies and tax incentives to promote housing production, encourage homeownership, provide decent shelter for low-income families, and improve conditions in deteriorated neighborhoods. *Prerequisites: Economics 1A-B or 2A-B.*

134. Regional Economics (4)
Examines the theoretical and empirical determinants of regional and metropolitan economic growth to explain past trends, to forecast future growth patterns, and to evaluate policies designed to redistribute economic activity between regions. *Prerequisites: Economics 1A-B or 2A-B.*

135. Urban Economics (4)
(Same as USP 102.) Urban economic problems and public policies to deal with them. *Prerequisites: Economics 1A-B or 2A-B.*

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 2A-B and Mathematics1A-B-C or 20A-B-C.*

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 or 2A-B and Economics 120A.*

138A-B. Economics of Health (4)
The application of economic analysis to the health field; the role of health in income, production, and poverty; supply, demand, and price determination in the public and private health sectors. *Prerequisites: Economics 1A-B or 2A-B.*

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 2A-B.*

145. Economics of Ocean Resources (4)
Economic issues associated with oceans. Living marine resources, nonliving marine resources, and other economic attributes of the sea. *Prerequisites: Economics 100A-B or 170A-B.*

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.*

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-B or 170A-B.*

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-B or 170A-B.*

152. Topics in Public Economics (4)
Special topics on the economics of the public sector. *Prerequisite: Economics 150.*

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 100B or 170B.*

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. *Prerequisite: upper-division standing.*

161. Latin American Economic Development (4)
Development issues facing Latin American countries. Economic policy. Emphasis on Argentina, Brazil, Chile, and Mexico. *Prerequisite: Economics 1A-B or 2A-B.*

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 2A-B.*

164. Korean Economy (4)
Survey of the Korean economy. Topics such as those for Economics 163. *Prerequisites: Economics 1A-B or 2A-B.*

170A-B. Management Science Microeconomics (4-4)
(Conjoined with Economics 170AH-BH.) Subject matter of Economics 100A-B, but with greater emphasis on the theory of the firm. Credit not allowed for both Economics 100A-B and Economics 170A-B. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Mathematics 2C.*

170AH-BH. Honors Management Science Microeconomics (4-4)
(Conjoined with Economics 170A-B.) Honors sequence covering the material of Economics 170A-B. *Prerequisite: department stamp required.*

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 1A-B or 2A-B, Economics 120A, Mathematics 20A-B-C, 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 1A-B or 2A-B and Mathematics20A-B-C and 20F. In addition, Economics 120A is required for Economics 172B and C. Economics 172A must be taken first, but Economics 172B and C may be taken in either order.* A student may not receive credit for both Economics 172A-172B and Mathematics 171A-171B. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions.

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; Recommended: Economics 60.*

174. Insurance, Economics, and Finance (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 and either 100A-B or Economics 170A-B. Economics 175 and Economics 171 are recommended.*

175. Financial Investments (4)
Valuation of assets including stocks, bonds, options, and futures contracts. Optimal portfolio selection and risk management. *Prerequisites: Economics 1A-B or 2A-B and 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 1A-B or 2A-B, Economics 120A-B.*

177. Topics in Operations Research (4)
Selected topics in operations research. *Prerequisites: Economics 120A and Economics 172A.*

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, forecasting evaluation, and the use of forecasts for public policy. *Prerequisites: Economics 1A-B or 2A-B and Economics 120A-B.*

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.*

180. Real Estate Finance (4)
Study of property law, mortgage underwriting practices, mortgage insurance programs, financial analysis, valuation principles, federal income-tax laws, investment analysis, financial institutions, real estate development, and capital markets. *Prerequisites: Economics 1A-B or 2A-B and Economics 60.*

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.*

191. Senior Essay Seminar (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.*

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.*

Note on overlaps: In general, a student may be denied credit for taking the same subject matter in more than one course, even if there is no explicit mention of the overlap issue in the course descriptions. In particular, the subject matter of Economics 120A-B overlaps the subject matter of probability and statistics courses offered in other departments (Mathematics 180A-181A, for example); and the subject matter of Economics 172A-B overlaps the subject matter of Mathematics 171A-B and AMES 146A-B. It is a student's responsibility to find out, by conferring with relevant advisers, what course combinations are advisable and when credit will be denied.

GRADUATE

200A-B-C-D-E. Microeconomics (4-4-4-4-4)
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.

201A-B-C-D. Advanced Economic Theory (4-4-4-4)
An intensive examination of selected topics in economic theory. Course topic nonrepetitive in a three-year cycle. *Prerequisites: Economics 200E and 210D.*

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 200E or consent of instructor.*

205. Mathematics for Economists (4)
Advanced calculus review for new graduate students.

210A-B-C-D. Macroeconomics (4-4-4-4)
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.

211A-B-C. Advanced Macroeconomics (4-4-4)
Selected theoretical and empirical issues in macroeconomics. *Prerequisite: Economics 210D or consent of instructor.*

214A-B. Finance (4-4)
Theoretical and empirical issues in finance.

220A-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. Both 220E and F will be offered simultaneously in the winter quarter.

221A-B-C. Advanced Econometrics (4-4-4)
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.

230A-B. Public Economics (4-4)
Theoretical and empirical issues in public economics. *Prerequisite: consent of instructor.*

232A-B-C. International Trade (4-4-4)
Theory of international trade, finance, and monetary relations. Growth, disturbances, capital movements, and balance of payments adjustment. International economic policy and welfare. *Prerequisite: consent of instructor.*

234A-B-C. Industrial Organization (4-4-4)
Theoretical and empirical issues in industrial organization. *Prerequisite: Economics 220F or 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.)

236A-B. Human Resource Economics (4-4)
Theoretical and empirical issues in human resource economics. *Prerequisite: consent of instructor.*

238. Urban and Regional Economics (4)
Theoretical and empirical issues in urban and regional economics. *Prerequisite: consent of instructor.*

240. Economic Development (4)
Theoretical and empirical issues in economic development.

242. Economics of Natural Resources (4)
Theoretical and empirical issues in natural resource economics.

267. 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. *Prerequisites: Economics 200E, 210D, and 220F, or consent of instructor.*

269. Seminar in Economics (4)
A program of regular reports by graduate students on their own research, usually dissertation research. Faculty and visitors are encouraged to participate. May be repeated for credit when subject matter changes.

271. Second-Year Seminar (2)
A survey of how economics research begins and an introduction to the current frontiers. Members of faculty will give 45-minute presentations in the seminar, with two presentations at each meeting. The talks will be at an introductory level and convey a research interest of the faculty member.

272. 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.

273. Third-Year Presentations (4)
Workshop for students writing third-year papers. All papers will be formally presented in the workshop.

274. Third-Year Original Paper (4)
Original research paper. For third-year students in spring quarter.

275. Third-Year Original Paper Presentations (4)
Workshop for students writing third-year original papers. All papers will be formally presented in the workshop.

276. Fourth-Year Original Paper (4)
Original research paper. For fourth-year students not admitted to candidacy by spring quarter.

277. Fourth-Year Original Paper Presentation (4)
Participation in appropriate workshop in conjunction with preparation and presentation of fourth-year paper.

280. Computation (2)
Introduction to econometric computing.

281. Topics in Computation (1)
Selected topics in econometric computing. May be repeated five times for credit.

291. Advanced Field Advising (4)
Controlled reading and discussion with adviser; literature survey. May be repeated for credit.

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)

Kaare Strom, Political Science, *Faculty Director*

David Woodruff, Biology, *Faculty Director*

David Wong, Physics, *Faculty Director*

Mary Dhooge, *Dean of International Education*

Kimberly Burton, *Assistant Director for Programs Abroad*

Molly Ann McCarren, *EAP Adviser*

Bill Clabby, *EAP Adviser*

Administered by the University of California, the Education Abroad Program (EAP) is now entering its thirty-fourth year of operation. Study Centers have been established in Australia, Austria, Barbados, Brazil, Canada, Chile, China, Costa Rica, Denmark, Egypt, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Russia, Singapore, Spain, Sweden, Taiwan, Thailand, and the United Kingdom. Some programs are for a single academic year, but shorter term/special focus programs are also offered in Brazil, Canada, Chile, China, Costa Rica, Denmark, France, Germany, Hungary, India, Indonesia, Italy, Japan, Korea, Mexico, Netherlands, Russia, Singapore, Sweden, Taiwan, and Thailand. The students who participate in the EAP earn UC academic credit and are eligible for financial aid and many scholarships. Other non-EAP study-abroad opportunities at UCSD are described at the end of this section.

The Education Abroad Program offers undergraduate 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.

The program stimulates the intellectual development of the participants, broadening the general education of all, and giving a new depth to the particular academic interests of some. 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.

One of the most distinctive features of the program is the emphasis placed on the full integration of the UC students into the life of the host university. For the most part, UC students abroad live as do the students of the host university: they attend the same classes, take courses from the same professors, and take part in local social and cultural activities. As an aid in facilitating UC student adjustment to unfamiliar educational practices, tutorials are included within the curriculum of most of the Study Centers, supplementing the regular academic offerings of the host university.

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 some cases EAP students pursue language study and enroll in special courses designed for the program.

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 and/or minor requirements. Some students fulfill some general-education requirements.

Academic Planning and Advising

A participant who wishes to make normal progress toward graduation should counsel in advance with a departmental adviser and an academic adviser in his or her college provost's office in order to ascertain how participation will affect his or her academic program. Descriptions of individual courses currently approved for UC credit may be found in the Programs Abroad Resource Library. 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 are added to a center's approved offerings as needed by UC students attending and as available at the host university. 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 units so earned in the fulfillment of the 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 any problem pertaining to their work. In addition, the directors are responsible for all aspects of student welfare and conduct.

Cost and Financial Aid

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 and vacation travel, 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. 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, there are EAP Opportunity Grants for economically disadvantaged students, EAP Alumni and General Scholarships, regional scholarships for European and most Pacific countries, country-specific scholarships, and scholarships provided by the Friends of the International Center and various campus offices and departments. Annually, UCSD students access more than $250,000 of special scholarships available only for study abroad.

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

Application forms for admission to the Education Abroad Program are available in the Programs Abroad Office at the International Center and are given to students following a discussion of various aspects of the program with an EAP adviser. Information on deadlines and related matters such as course offerings, information sessions, selection, schedules of departures, and payment of fees may be obtained from the Programs Abroad Office. Study abroad information is also available on-line by accessing International Education options on UCSD's InfoPath under Academic Resources (http://www.infopath@ucsd.edu/campus/department/academic/index.html).

It is not too early to begin planning for an experience abroad during one's freshman year. General group information sessions about the programs are held during Welcome Week and in October and January.

Study Options

At any one center, the courses and fields of study open to UC students may be limited. Moreover, each of the host institutions has special areas of excellence and strength. The listing of centers below incorporates targeted fields of study for EAP students, although substantial course work in other fields may also be available. More detailed information is available in the flyers describing each of the centers and from the Education Abroad Program advisers in the Programs Abroad Office in the International Center. Interested students may also discuss the program with academic advisers in their respective provost offices and with faculty/study abroad advisers in each academic department.

Europe

Austria. The program is small and is designed to offer an opportunity to pursue a specialized interest in the areas described below. A compulsory intensive language course in Vienna precedes the beginning of the academic year. All courses are taught in German.

University of Vienna. Available fields of study include: art history, Austrian and German literature and language, business/management studies, economics, European Studies, history, international relations, music, political science, psychology.

Vienna University of Economics and Business Administration (WU). Available to a limited number of students interested in applied economics, business, management, and related studies.

Denmark. Three options are available:

Semester or Academic Year. The academic year program begins with a summer-long intensive language program and the semester program with a three-week language program at the University of Copenhagen. Thereafter, UC students take regular university courses in selected fields and continue language study. Targeted fields include: Arctic studies, biological sciences, international relations, legal studies, European studies, political science, public health, and Scandinavian languages/literature/folklore, and area studies. Instruction is in Danish and English; some supporting tests are in English, and exams and papers in most fields may be completed in English.

Summer-Only Program. The summer language program noted above at the University of Copenhagen may be taken independently. Students with at least sophomore standing at UC may participate.

France. Two options are available: Students of most academic disciplines can be accommodated in regular university courses, taught in French, for a full academic year at the universities identified below. A minimum of two years of university-level French is required. EAP also offers a fall language and society semester in Lyon, which combines language study with coursework on contemporary France. This option requires a minimum of three quarters, but no more than five quarters of university-level French.

Academic Year Programs. All students participate in an orientation and Intensive Language Program (ILP) in France prior to the start of the academic year. Following the ILP, students either enroll in French universities and take lecture and tutorial classes or (in the Paris program) take courses designed specially for EAP students. UC faculty directors are in residence at Bordeaux and Lyon.

University of Bordeaux. Targeted fields of study include anthropology, archaeology, art history, environmental/ecological studies, French literature, geography, history, international relations, political science, and sociology.

University of Grenoble. Courses are particularly strong in communications, French language and literature, history, international relations, linguistics, political science, and sociology. Outstanding science students who have good French language ability may take science courses in Grenoble.

University of Lyon. Most EAP students in Lyon take courses offered through the Institute of Political Sciences, which offers a multidisciplinary curriculum aimed at providing an intellectual basis for the interpretation of contemporary societies. Particularly strong are courses in art history, French language and literature, history, and political science.

Paris. EAP students in Paris enroll in the Critical Studies Program, offered in cooperation with the University of Paris III (Sorbonne Nouvelle). Courses focus on contemporary literary criticism and film theory, and explore recent theoretical concepts in other fields, including communications/media studies, comparative literature, film studies, French language and literature, literary theory, and philosophy.

University of Toulouse. Business/management studies, comparative literature, economics, geography, international relations, and political science are targeted fields for EAP students.

Lyon Fall French Language and Society Program. This fall semester option consists of intensive French language study and core courses on contemporary France, art and culture.

Special Graduate Student opportunities in France are available at:

- *Ecole Normale Supérieure-Paris,* for research and courses in the humanities, social sciences, and the sciences.
- *Ecole Normale Supérieure de Fontenay-St. Cloud* (outside Paris), for research and courses in French literature, linguistics, and philosophy.

Germany. Two options are available: a full academic year at Georg-August University in Goettingen and a German Studies Semester (fall or spring) at the University of Bayreuth.

Georg-August University of Goettingen. EAP participants study in most academic disciplines in regular university courses. Targeted fields for UC students include biological studies, business and management studies, economics, European studies, German language and literature, history, international relations, political science, and psychology. Special studies are available in contemporary German politics and European studies. Selected students may have the opportunity to spend the spring semester at one of the Berlin-area universities. Instruction is in German. A six-week intensive language program precedes the year. Two years of university-level German is required.

University of Bayreuth. EAP offers a one-semester German language and culture program. The program will be offered in the spring and will concentrate on German language, providing the equivalent of second year of German in one semester. Students with at least sophomore standing at UC may participate. Three to five quarters of German are required.

Hungary. A fall semester and a year-long program at *Eötvös Loránd University in Budapest* focus on Central European studies. The courses, designed for EAP and taught in English, are in the fields of economics, European studies, history, Hungarian language/literature, international relations, political science, and sociology.

Italy. In addition to the full academic year programs in Bologna, Padua, Pisa, and Venice, there are semester options in Milan and Pisa, and a short-term language and culture program in Siena. A compulsory intensive language program precedes the beginning of the academic year. Students who have completed only one year of Italian are eligible for participation in the EAP in Italy but, if selected, must complete the equivalent of the second year prior to the start of the program by attending the "pre" Intensive Language Program offered during the summer in Italy. A UC faculty director residing in Padua administers all EAP programs in Italy. All courses are taught in Italian.

University of Bologna, acclaimed as the oldest university in Europe (1088). Special strengths for UC students are: art history, business and management studies, dramatic arts, economics, film studies, international relations, Italian language and literature, political science, and sociology.

University of Padua. The academic program consists mainly of regular university courses with particular strengths in art history, international relations, Italian language and literature, political science, psychology, sociology.

University of Venice. Business/management, economics, environmental/ecological science, Italian literature and language, and Venetian studies are targeted fields for EAP students.

Special focus programs are also available in Italy for qualified students at the following institutions:

- *Bocconi University, Milan,* offers semester studies in business administration, economics, management, public administration.
- *La Scuola Normale Superiore di Pisa,* founded by Napoleon, offers curricula in medieval and Renaissance studies, history, philosophy, and art history.
- *Siena.* In the spring, EAP offers a language and society quarter/semester program at the University for Foreigners at Siena. The program will provide the equivalent of one year of Italian language instruction and coursework on Italian culture. Students with at least sophomore standing at UC may participate. One year of university-level Italian is required for the semester program. No previous knowledge of Italian is required for participation in the quarter program.
- *Venice Institute of Architecture* provides excellent instruction in architecture, architec-

tural history, urban planning, conservation, and restoration.

Netherlands. *University of Amsterdam.* EAP offers a fall semester and academic year program with a thematic focus in contemporary European studies and European integration. Instruction is in English, but Dutch language study is required. Students proficient in Dutch may take selected courses taught in Dutch. Prior course work in European studies is required.

Russia. EAP offers a fall semester program of special courses designed for EAP students in Russian language, politics, literature, and sociology at the European University in Moscow. The curriculum is taught by faculty from various institutions in Moscow. Instruction is in Russian. A four-week intensive language program precedes the semester. A minimum of two years of university-level Russian is required.

Spain. *Academic Year.* Most UC students study at the University of Alcala de Henares, the University of Barcelona, the University of Granada, or the Complutense University of Madrid. Advanced students may also study at the Autonomous Universities of Barcelona or Madrid. EAP participants at all locations select regular university courses based on individual academic interests and, at the Universities of Alcala, Barcelona, Granada, and Madrid, special courses or tutorials designed for EAP. The language of instruction is Spanish at all universities; however, in Barcelona, Catalan also may be used. Four weeks of intensive Spanish language study precede the academic year. The program requires two years of university-level Spanish. The Autonomous Universities of Barcelona and Madrid require near-native fluency.

Sweden. EAP offers an academic year and a fall semester program at Lund University. The academic year program consists of an intensive language program followed by regular university courses and continued language study during the academic year. A separate semester program consists of a survival Swedish course taken in August, followed by selected studies at the Lund University during the fall. Most courses are taught in Swedish, but a few courses offered in English may be available.

University of Lund. Strong fields for EAP students are: architecture, biological sciences, chemistry, economics, engineering, environmental studies, international relations, law, political science, psychology, Scandinavian language/literature/folklore, and sociology.

United Kingdom and Ireland. The program, which includes twenty institutions, is administered by a director and associate director located in London. After a student has been nominated for participation by the campus EAP selection committee, he or she must still be accepted by a specific department in one of the host institutions. In many host institutions, the student can pursue studies in that department only. Participating institutions are:

England. *Queen Mary and Westfield College in London, University of Birmingham, University of East Anglia, University of Essex, University of Exeter, University of Hull, University of Kent at Canterbury, King's College, University of Lancaster, University of Leeds, University of Sheffield, University of Sussex, University of Warwick, and University of York.*

Ireland. *University College Cork, University College Galway.*

Scotland. *University of Edinburgh, University of Glasgow, University of St. Andrews, University of Stirling.*

Generally, the host universities offer a broad curriculum that includes most liberal arts majors. Engineering, life sciences, and physical sciences are also strong.

Middle East

Egypt. *The American University, Cairo.* All students are required to take at least one course in Arabic during the year. All other courses are taught in English. Substantial course work is available in Arabic language, developmental studies, Egyptian studies, international relations.

Israel. A compulsory language course (ulpan) precedes the beginning of the academic year. Students have a choice of taking the ulpan in either Haifa or Jerusalem.

Hebrew University, Jerusalem. Most UC students enroll in courses taught in English at the University's Rothberg School for Overseas Students. Offerings include ancient history, anthropology, archaeology, Hebrew language and literature, history, Holocaust studies, Middle Eastern studies, philosophy, political science, religious studies. Students with an advanced level of Hebrew have access to a broader curriculum throughout the Hebrew University.

Ben-Gurion University of the Negev, Beersheva. Negev Research Program: Advanced students may participate in a fall, spring, or year program at Ben-Gurion University that focuses on research in English in one of two tracks: social-scientific study of Israel's ethnic minorities, or laboratory study in the health sciences and the natural sciences in areas related to Israel's environment. A six-week intensive language program at Ben-Gurion precedes the program, and Hebrew study is required each term.

Asia

India. EAP offers a fall semester and an academic year option. The program begins with a summer orientation and Hindi language program in Mussoorie.

University of Delhi. Students enroll in regular university classes and take special core courses on Indian culture and society which are designed specifically for EAP students. Substantial course work is available in anthropology, Hindi, history, mathematics, music and fine arts, philosophy, psychology, and sociology.

Jawaharlal Nehru University, New Delhi. Course work is available in economics, developmental studies, environmental studies, political science, and other social sciences.

China. Both the academic year program at Peking University and the semester-long program at Beijing Normal University begin in early July with an orientation and seven-week intensive language program at Tsinghua University in Beijing.

Fall Program at *Beijing Normal University (BNU)* concentrates on Chinese language acquisition in written and spoken Chinese. One year of university-level Chinese is required. BNU students may petition to extend their participation from fall to the year at Peking University or BNU.

Year Program at *Peking University ("Beida").* Students take classes in standard Chinese (grammar, oral and written expression) and literature at the Center for Teaching Chinese to Foreigners at Peking University. Students with adequate language ability are encouraged to take regular university classes. Two years of university-level Chinese are required.

Taiwan. *National Taiwan University, Taipei.* Fall and year programs are offered. In addition to intensive language instruction, students take specifically designed EAP courses (in English) in Chinese and Asian area studies. Those with adequate language skills may also take regular university courses taught in standard Chinese. Two years of university-level Chinese are required.

Hong Kong. *Chinese University in Hong Kong.* Cantonese language study precedes the academic year. Courses taught in English are taken through the International Asian Studies Program at CUHK in Asian studies, Chinese language and literature, comparative literature, international relations, political science. With adequate language preparation, courses may be taken in standard Chinese or Cantonese.

Japan. EAP offers general-education programs as well as specialized programs in engineering, economics, global security and development studies, and advanced Japanese language. These are full-year programs, except for the Global Security Program and Tohoku Engineering Spring Program, which are spring quarter only (but semester-length). Language requirements depend on the specific program. All the full-year programs (except IUC and Tohoku Engineering Year) require an Intensive Language Program in Japan during the summer preceding the academic year. Japanese language instruction continues throughout the year (intensity depending on the program).

Doshisha University (Kyoto). Primarily for undergraduates, the program consists of regular university courses and Japanese language classes. All courses are taught in Japanese. Exams and papers usually may be written in *English*. Japanese language prerequisite: three years.

University of Kyoto (Kyoto) For undergraduate or graduate students, the program consists of regular university course offerings plus Japanese language classes. All courses are taught in Japanese. Japanese language prerequisite: three years.

Osaka University (Osaka). Undergraduate economics or graduate/undergraduate engineering students with three years of university-level Japanese may be placed at Osaka. Graduate engineering students may have less Japanese depending on their research project. All courses are taught in Japanese.

Tohoku University (Sendai). Study in Tohoku will be divided into two sections: 1) English Language Engineering Program and 2) all other disciplines. Studies in most fields can be pursued by graduate students with well-developed individual research projects. The program also accepts undergraduates who can follow lectures and manage reading assignments in Japanese. For undergraduates, three or more years of university-level Japanese is required. For graduate students, two years university-level Japanese and an acceptable research proposal. All courses are taught in Japanese.

The Tohoku Engineering (Spring Semester or Full year) program is for junior year students or students entering the sixth quarter in their sophomore year to take basic engineering and physics courses taught in English. Japanese language, culture, and society programs are also offered in English. Japanese language prerequisite: none. (No ILP is planned for Tohoku Engineering Spring Program participants at this writing.)

International Christian University (Mitaka, Tokyo). Primarily for undergraduates. Of particular interest are courses in Japanese language, area studies, and international relations, many of which are taught in English. Courses in a variety of other disciplines are also offered, taught mostly in Japanese. Japanese language prerequisite: one year.

Sophia University (Tokyo). Primarily for undergraduates, the program consists of Japanese language courses and courses taken in the Faculty of Comparative Culture (all courses are taught in English). One year of university-level Japanese required.

Tokyo Institute of Technology (Tokyo). For graduate students who intend to pursue Engineering research projects or undergraduate students who can either take courses in Japanese or would benefit from studying in a research lab environment on directed engineering research projects. The program requires a summer intensive language course and Japanese language study during the year. Two to three years or more of university-level Japanese is required for this program, depending on interest in research or course work.

University of Tokyo, Hongo Campus (Tokyo). For graduate students who intend to conduct Engineering research or undergraduate students who can either take courses in Japanese or would benefit from studying in a research lab environment on directed engineering research projects. The program requires a summer intensive language course and Japanese language study during the year. Three years or more of university-level Japanese required for this program.

University of Tokyo, Komaba Campus (Tokyo). For undergraduate who intend to study Japanese language and culture and do some course work in their major. The program has a core course requirement in Japanese Area Studies and offers, in English, a variety of regular social science and liberal arts classes, Japanese language, special seminars, and fieldwork/reseaarch options. Japanese language prerequisite: one year, (regular Japanese courses are available for those with enough Japanese.)

Tsukuba University (Tokyo metropolitan area). For undergraduates interested in Japanese language, international studies, and related courses. The program has a core course requirement in Japanese Area Studies and offers, in English, a variety of regular courses. Japanese language prerequisite: one year.

Inter-University Center for Japanese Language Studies (Yokohama). IUC offers an intensive program of training for graduate students or advanced undergraduates in Japanese. It is designed to bring participants to a level of proficiency sufficient for academic or professional use. Students must be qualified to study Japanese at an advanced level.

Meiji Gakuin University (Yokohama). Offered only in spring quarter, the Global Security and Development Studies Program consists of intensive study of international relations, international security, and development issues in Asia. This program is especially well-suited for economics, political science, and international relations students, and students in Asian Area Studies. All courses are taught in English. Japanese language prerequisite: none.

Korea. Students study for either summer/fall or a year at *Yonsei University in Seoul.* The academic program includes language study and courses taught in English through the Division of International Education, with Asian studies and Korean language/literature especially strong. EAP students proficient in Korean may enroll in regular university courses in a wide range of fields.

Indonesia. EAP offers a fall semester and an academic year option. EAP students begin with a four-week orientation and language program,

followed by a fall semester at *Gadjah Mada University* in Yogyakarta. The curriculum includes language study and courses taught in English in anthropology, development studies, economics, history, the arts, and Asian studies. During the second semester, students take regular university courses taught in Indonesian in a wide range of fields at either Gadjah Mada or the *Indonesian Arts Institute.*

Singapore. EAP offers a fall semester and academic year program at the National University of Singapore. UC students will take regular university courses taught in English with emphasis on biology, business, economics, sociology, and Southeast Asian studies.

Thailand. EAP offers primarily a fall semester program in Thailand. Undergraduate and graduate students with advanced proficiency in Thai language and approved academic course or research goals may be able to extend participation through the second semester. Most EAP students begin their studies in July with a four-week intensive language program (ILP) at Chiang Mai University, followed in the fall by continued language study and courses in English on Thai history, culture, and Southeast Asian studies. Those proficient in Thai may enroll directly in regular university courses in a wide range of fields at Chiang Mai University or Chulalongkorn University in Bangkok.

Africa

Ghana. *University of Ghana in Accra.* Strong offerings are available in African studies, anthropology, art history, dramatic arts, economics, geography, history, linguistics, paleontology, political science, religious studies, sociology.

University of Science & Technology, Kumasi. UC students will have access to courses in the following areas: the College of Art, the Faculty of Agriculture, the Faculty of Environmental and Development Studies, and the Institute of Renewable Resources.

Caribbean

Barbados. *Cave Hill University.* Full year program focuses on the Caribbean region from the perspective of its history, politics, social issues and institutions, economics, literature or linguistics. A special feature of the program is the opportunity for independent study.

Latin America

Brazil. Language requirements for admission to this program are two years of college-level Portuguese or Spanish, or one year of college Spanish and one year of college Portuguese. Starting in winter quarter, the program includes intensive language study at a site outside of Rio, and then a semester (March to July) or year (March to December) of study in Rio de Janeiro.

Pontifical University of Rio de Janeiro (PUC-Rio). The academic program consists of Portuguese language study and regular university courses, with particularly strong offerings in Brazilian literature, development studies, economics, environmental studies, history, Latin American studies, psychology, and religious studies.

Chile. The program begins in January at *University of Cuyo in Mendoza, Argentina,* with intensive language study and courses on Argentine/Chilean relations. Participants then study for a semester or academic year in Santiago, taking regular university courses taught in Spanish at one of two institutions. A minimum of two years of university-level Spanish is required..

University of Chile, Santiago. Of particular interest to UC students are courses in anthropology, cultural studies, economics, Latin American studies, history, language, and linguistics.

The Pontifical Catholic University, Santiago. Of particular interest are courses in biology, economics, engineering, environmental studies, Latin American studies, and political science.

Costa Rica. There are two different programs:

University of Costa Rica. Students have the option of studying for a semester or a year. Following an intensive language program, students take regular university courses, with targeted areas being economics, geography, history, political science, Spanish language and literature. Two years of university-level Spanish required. The program begins during our winter quarter.

Tropical Biology Program. During spring or fall quarter, students who meet certain biology prerequisites (BIEB 100, 120, and ecology lab) may study tropical biology in the rain forest of Monteverde or Las Cruces. Previous Spanish is preferred.

Mexico. EAP offers a fall semester and academic year program at the Universidad Nacional Autonoma de Mexico (UNAM) in Mexico City, fall and spring semester Field Research Programs (FRP) at various sites throughout Mexico, and Language and Society programs at San Nicolas de Hidalgo University of Michoacan in Morelia (summer) and at UNAM's School of Foreigners (CEPE) in Taxco (winter).

La Universidad Nacional Autonoma de México (UNAM). EAP students may study at UNAM for two quarters or a full year. The program begins with a six-week Intensive Language Program (ILP). Concurrently with the ILP, students take a course on contemporary Mexico. While students of most academic disciplines can be accommodated, UC students typically take classes in the faculties of Economics, Philosophy and Letters, Political and Social Science, Psychology, Sciences, the School of Fine Arts, and the School of Languages. All courses are taught in Spanish. EAP-sponsored tutorials complement some courses.

Language and Society Summer Program. La Universidad Michoacana de San Nicolas de Hidalgo in Morelia. Completion of two terms of university work and one year of university-level Spanish are required for the ten-week summer program, which provides the equivalent of the entire second year of Spanish. Courses are designed to facilitate maximum language acquisition through total immersion into Mexican society.

Field Research Program (FRP). The FRP offers students the opportunity to learn about Mexico and pursue a research topic at one of the several sites around the country. The program begins with six weeks of intensive language study and a course on contemporary Mexico at UNAM's School for Foreigners. Following these introductory courses, students take a one-week intensive seminar on the methodology of doing field research in Mexico. Final design of students' research projects takes place during this seminar. Upon completion of formal coursework, students disperse to several sites in Mexico to pursue their research for about two months. At the conclusion of the field portion of the program, students return to Mexico City and make an oral presentation of their research paper. In addition to Mexico City, there are usually four regional sites for research:

Guadalajara (Jalisco); Merida (Yucatan); Monterrey (Nuevo Leon); and Oaxaca (Oaxaca). Each site holds particular advantages for specific types of research.

Language and Society Program, Taxco. EAP offers a winter Language and Culture Quarter at UNAM's School for Foreigners in Taxco. The curriculum is designed for students who have already completed one or more years of Spanish and want to add a year's worth of language training in a short period abroad. Students with at least sophomore standing are eligible.

South Pacific

Australia. The University of California enables students to study at one of eleven universities in Australia: LaTrobe, Monash, and the University of Melbourne in Melbourne; the University of Sydney and the University of New South Wales in Sydney; the University of Adelaide and Flinders University in Adelaide; the University of Wollongong; University of Western Australia in Perth; the University of Queensland in Brisbane; and the Australian National University in Canberra. Students may indicate a preference for the host university, but final assignment is based on a student's academic field and space availability in a given department at one of the universities. Once accepted, students are expected to concentrate on their major or closely allied field. Students of most academic disciplines can be accommodated in one of the institutions. The program in Australia commences during our winter quarter.

New Zealand. Students may study at one of seven universities in New Zealand: the University of Auckland, Lincoln University, University of Otago, Victoria University of Wellington, University of Canterbury, the University of Waikato, and Massey University. Students may indicate a preference for the host institution, but final assignment is based on a student's academic field and space availability in a given department. Most academic disciplines can be accommodated. The program begins during our winter quarter.

North America

Canada. *The University of British Columbia (UBC)* is located outside of Vancouver. This academic-year program will consist of courses in the major or an allied field through the regular university system. Most disciplines can be accommodated. A fall semester program can be accommodated in certain fields. UBC is renowned for agriculture, anthropology, Asian studies, biological sciences, Canadian studies, engineering, forestry, Pacific Region studies, and women's studies.

Selection

Undergraduate selection is subject to the following minimum qualifications: 3.0 cumulative grade-point average at the time of application (2.5 GPA for the Mexico Field Research Program); junior standing by time of departure (not required for some short-term and special-focus programs); 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.

Prior language is recommended but not required for study in Denmark, Egypt, Hong Kong, Hungary, India, Indonesia, Israel, Korea, Sweden, and Thailand. In addition to academic criteria for selection, the faculty committee attaches much importance to indications of the student's seriousness of purpose, maturity, and capacity to adapt to the experience of study abroad. As part of the screening process, students are required to consult with their college academic and department advisers.

Graduate students may apply for most study centers if they have completed at least one year of graduate work prior to departure and have the support of their academic department and the dean of Graduate Studies.

Transfer students from other colleges and universities are eligible if they have completed at least one quarter at the University of California at the time of selection.

Student Conduct and Parental Approval

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. Students participating in the Education Abroad Program are responsible to the director of the center, to the director of the EAP, to the faculty of the University of California, and to the faculty members of the host university who are related to the program. The director of the EAP reserves the right to terminate the participation in the program of any student whose conduct (in either academic or nonacademic matters), after careful consideration and full review, is judged to be contrary to the standards and regulations of the host university.

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)

Kaare Strom, Political Science, *Faculty Director*

David Woodruff, Biology, *Faculty Director*

David Wong, Physics, *Faculty Director*

Mary Dhooge, *Dean of International Education*

Kimberly Burton and William Clabby, *Advisers*

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. Financial aid for approved plans of study abroad is available to students who enroll concurrently at UCSD through the Opportunities Abroad Program.

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, Building 412, University Center

[redacted]

OFFICE: Eleanor Roosevelt College Writing Program, Building 412, University Center

See "The Making of the Modern World" program for Eleanor Roosevelt Writing.

[redacted]

OFFICE: Provost, Eleanor Roosevelt College, Building 412, University Center

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 both 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 also receive additional free computer time and 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 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 receive 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. (F)

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. (W,S)

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 over three 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.*

[redacted]

OFFICE: Provost, Eleanor Roosevelt College, Building 412, University Center

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. (F,W,S)

Engineering, School of

OFFICE: 7301 Engineering Building Unit 1, Warren College

The School of Engineering at UCSD comprises the Departments of Applied Mechanics and Engineering Sciences (AMES), Bioengineering (BE), Computer Science and Engineering (CSE), and Electrical and Computer Engineering (ECE). The school is directed by the dean of engineering. The departments offer many undergraduate and graduate degree programs. Students interested in engineering should consult the individual department listings which follow this section of the catalog.

The general-education requirements of UCSD's five undergraduate colleges differ noticeably. In some cases, these requirements can extend the time required to obtain a B.S. degree in engineering. Prospective students should review the general-education requirements and take them into account when selecting a college.

[redacted]

Student demand exceeds program capacity in several of the undergraduate majors. Therefore, admission into an engineering major is based on academic excellence demonstrated at UCSD or in high school. Admission will be granted to the maximum number of students in each major program consistent with maintaining acceptable program quality.

FRESHMAN

Freshman are admitted to engineering majors in one of two ways, either directly into the major of their choice or into a preliminary pre-major of their choice. This selection is based on the student's high school GPA and SAT performance as well as the ability of the particular major to accept new students. The pre-major is a provisional status and acceptance to major status is dependent on performance in selected screening courses. Students are notified of their status when they are admitted to UCSD. Major and pre-major students both receive the same college and departmental advising and are expected to take the same courses. In addition to the required science, math, and engineering courses required by the departments, it is expected that all students will also take twelve to eighteen units of general-education college requirements during their first year.

It is strongly suggested that both majors and pre-majors 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.

Pre-major engineering students are expected to apply for admission to a major during the spring quarter of their freshman year. Certain of the introductory math, science, and engineering courses will be used as screening courses in order to determine which of the pre-major students will be accepted into a major and which will not be accommodated by the School of Engineering. Admission to a major is based on the grade point average in the screening courses only for those students who are able to apply by the end of their third quarter. The grade point average required for admission to the major by pre-majors is set individually by each engineering program and varies substantially according to the ability of the program to accommodate extra students. Pre-majors should consult their departments concerning the appropriate screening courses and the current grade point average standards for admission. However, a B average in the screening courses will guarantee admission to any of the majors when application is made before the end of the third quarter of study at UCSD.

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 apply before the end of their sixth quarter of study at UCSD. **No admission to an engineering major will be considered after six quarters of study.** The admission review after the third quarter will not be based on the grade point average in the screening courses alone. Admission review, after the third quarter, will also include consideration of the student's entire academic record, progress in science, math and engineering courses, and other factors such as course load and trends in performance.

TRANSFERS

Transfer students entering the university with 36.0 or more quarter units may apply for admission to the major **no later than their third quarter of study at UCSD.** Students seeking admission to CSE and ECE may apply for admission to the major upon entry to UCSD. Students seeking admission to AMES should complete at least six courses (science, mathematics, and/or engineering) at UCSD prior to submitting an application. Two of the six courses may be in progress when applying in the third quarter. Students seeking admission into BE must complete at least two required pre-bioengineering or bioengineering courses, one of which must be an upper-division course. AMES and BE transfer students are evaluated on an individual basis on performance at UCSD and their previous schools. Transfer students entering the university with fewer than 36.0 quarter units will have six quarters to apply. Transfer students must seek a preliminary appraisal by the department as soon as possible after they arrive on campus.

Since admissions are restricted, pre-engineering students may apply to more than one major degree program. Applications must be submitted to the appropriate Undergraduate Affairs Office, in AMES (182 Engineering Building II), Bioengineering (4103 Engineering Building I), CSE (4016 Applied Physics and Mathematics Building), or ECE (2705 Engineering Building I). These offices may be consulted for additional details.

[redacted]

The number of students admitted to some upper-division courses offered by the School of Engineering must be restricted to meet the resources available. Students who have successfully completed all prerequisite courses will be admitted to these restricted upper-division courses in the following order:

1. Students admitted by the department to a major curriculum
2. Students admitted 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 School of Engineering policy not to approve double B.S. 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 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 Engineering Student Council and Engineering Student Professional Organizations, Engineering Student Employment Opportunities, the Internship Program, Pre-College Outreach, and the **MESA** Engineering Program **(MEP).**

MESA, the Mathematics, Engineering and Science Achievement Program, is a statewide effort to prepare more students from historically underrepresented backgrounds for careers in mathematics and science-based professions. MEP has been established to attract and retain qualified underrepresented students in engineering. MEP programs include academic advising and workshops, scholarships, opportunities for summer employment, and a variety of social events throughout the year. Strong support from local industry provides students the opportunity to explore career possibilities as early as their freshman year.

All engineering students are encouraged to become involved with ESS programs. Further information can be obtained at the ESS office in Room 304, Engineering Building II.

Advanced Manufacturing Program

Student Affairs:
302 University Center, Room 11,
Warren College
(619) 534-7398, fax: (619) 534-7427,
e-mail: PAM@ece.ucsd.edu

World Wide Web home page:
http://soeadm.ucsd.edu/academic/amp/amp.html

Industry Relations:
302 University Center, Room 12,
Warren College
(619) 534-7988

Faculty:

Roger Bohn, Ph.D., *IR/PS*
Charles Elkan, Ph.D., *CSE*
Joseph Goguen, Ph.D., *CSE*
Taekwon Kim, Ph.D., *IR/PS*
Kenneth Kreutz-Delgado, Ph.D., *ECE*
Hidenori Murakami, Ph.D., *AMES*
Mohan Trivedi, Ph.D., *ECE*

Industry support

Industry support provided by leading engineering, electronic, and manufacturing companies in the USA and greater San Diego area.

The cross-departmental master of science specialization in Advanced Manufacturing at UCSD is designed to provide students with the knowledge of advanced manufacturing technologies as well as management, cultural, and international issues relevant to today's globally competitive, multicultural manufacturing environments. The two-year program is comprised of three tracks of study: engineering, management, and practical. The practical track includes a full-time, nine-month internship in a manufacturing company to ensure industry relevance and gain additional hands-on learning.

Today's successful manufacturing engineers are required to be knowledgeable in all aspects of the manufacturing process from design to production of the product. The interdisciplinary nature of the program is ideally suited to address this requirement. The Program is supported by the Departments of Applied Mechanics and Engineering Sciences (AMES), the Computer Science and Engineering (CSE), the Electrical and Computer Engineering (ECE), and the Graduate School of International Relations and Pacific Studies (IR/PS), as well as the San Diego Supercomputer Center (SDCC), the Center for Magnetic Recording Research (CMRR), and the Center for Information Engineering (CIE). Particular emphases within the program is information engineering in manufacturing and the practical application of engineering and management theory within the manufacturing process.

The program in Advanced Manufacturing is governed by its directors, a faculty steering committee, and an industry steering committee to produce a challenging academic program for training students for positions in manufacturing companies.

Undergraduate preparation for the master of science specialization in Advanced Manufacturing normally would include a degree in engineering or physical sciences, such as physics or chemistry. Interested students would have a strong mathematics and engineering sciences background. Students admitted into the program will also have a minimum of three years of industrial experience in a manufacturing company. The criteria used for student selection include: work experience, undergraduate preparation and GPA, letters of recommendation, statement of purpose, and GRE scores. Prior to being admitted into the program all candidates advanced to the final selection stage will be interviewed by a panel consisting of UCSD faculty and industry representatives.

Students will be admitted into the program through one of the following SOE home departments: AMES, CSE, or ECE. Upon graduation, students will be awarded an M.S. degree in their home department with a specialization in Advanced Manufacturing, e.g., M.S. in ECE (Advanced Manufacturing).

The requirements for the M.S. degree are as follows:

1. All students must complete a total of sixty-eight units (includes twelve units of research credit for internship).
2. All students must complete the following core courses maintaining a 3.2 GPA:

   ECE 211A (two quarters); ECE 211B (two quarters); ECE 210; AMES 261; AMES 262; CSE 255; IRGN 441; IRGN 442; IRGN 444; Nine-month Internship/299 Level Research (twelve units).

   Course descriptions are located in the *UCSD General Catalog* under the appropriate department.
3. An elective concentration based on any combination of classes totaling twenty units taken from the various engineering departments or the Graduate School of International Relations and Pacific Studies must be taken to complete the fifty-eight-unit (core and electives classes) requirement for the M.S. degree. No more than two courses making up the elective concentration can be at the 100-level and up to twelve units of 298, Independent Study, can be used under the guidance of the student's faculty adviser.
4. Students must complete a thesis (Plan 1) as described in the "Graduate Studies" section of this catalog. A student's M.S. thesis committee consists of the student's faculty research adviser and two other faculty members from the School of Engineering or the Graduate School of International Relations and Pacific Studies. At least one faculty member from the student's home department must serve on the student's thesis committee. Additionally, the student's industry adviser may sit on their committee as a fourth member of the committee only. However, this is optional.

5. Students must meet all other requirements established by the university.

Applied Mechanics and Engineering Sciences (AMES)

STUDENT AFFAIRS: 182 Engineering Building II, Warren College

Professors

R. J. Asaro, Ph.D.
R. Cattolica, Ph.D.
R.W. Conn, Ph.D., *Dean, School of Engineering*
C. H. Gibson, Ph.D.
J. D. Goddard, Ph.D.
G. A. Hegemier, Ph.D.
J. Lasheras, Ph.D.
J. E. Luco, Ph.D., *Vice-Chair*
X. Markenscoff, Ph.D.
M A. Meyers, Ph.D.
S. Middleman, D. Eng.
D. R. Miller, Ph.D., *Associate Dean, School of Engineering*
H. Murakami, Ph.D.
S. Nemat-Nasser, Ph.D., *Director, Center of Excellence for Advanced Materials*
C. Pozrikidis, Ph.D.
M. J. N. Priestley, Ph.D.
F. Seible, Ph.D.
K. Seshadri, Ph.D.
F. E. Talke, Ph.D., *CMRR Endowed Chair*
F. A. Williams, Ph.D., *Director, Center for Energy and Combustion Research, Department Chair*

Professors Emeritus

H. Bradner, Ph.D.
P. A. Libby, Ph.D.
S.-C. Lin, Ph.D.
J. W. Miles, Ph.D.
W. Nachbar, Ph.D.
D. B. Olfe, Ph.D.
S. S. Penner, Ph.D.
S. Rand, Ph.D., *Associate Professor*
E. Reissner, D. Eng., Ph.D.
A. M. Schneider, Sc.D.
H. W. Sorenson
C. W. Van Atta, Ph.D.

Associate Professors

D. J. Benson, Ph.D.
P. C. Chau, Ph.D.
R. K. Herz, Ph.D.
A. Hoger, Ph.D.
J. B. Kosmatka, Ph.D.
J. M. McKittrick, Ph.D.
V. Nesterenko, Ph.D., *Associate Professor in Residence*
S. Sarkar, Ph.D.
J. B. Talbot, Ph.D.
C. M. Uang, Ph.D.
K. S. Vecchio, Ph.D.

Assistant Professors

S. Ashford, Ph.D.
V. Karbhari, Ph.D.
K. Nomura, Ph.D.

Affiliated Faculty

L. Armi, Ph.D., *Professor, SIO*
M. J. Bailey, Ph.D., *Associate Adjunct Professor of Computer Graphics*
A. L. Berlad, Ph.D., *Adjunct Professor of Combustion Science*
D. B. Bogy, Ph.D., *Professor of Mechanical Engineering, UC Berkeley*
A. S. Gordon, Ph.D., *Adjunct Professor of Engineering Chemistry*
R. J. Seymour, Ph.D., *Adjunct Professor of Engineering*
M. T. Simnad, Ph.D., *Adjunct Professor of Nuclear Engineering and Materials Science*
J. B. Slaughter, Ph.D., *Adjunct Professor of Engineering*

Professional Research Staff

S. Ahzi, Ph.D., *Assistant Research Engineer*
B. Balendran, Ph.D., *Assistant Project Scientist*
M. Beizaie, Ph.D., *Assistant Research Engineer*
A. Didwania, Ph.D., *Assistant Project Scientist*
B. Hoghooghi, Ph.D., *Assistant Project Scientist*
B. Kad, Ph.D., *Assistant Project Scientist*
J. S. Kim, Ph.D., *Assistant Project Scientist*
S. C. Li, Ph.D., *Assistant Research Engineer*
S. Luckhardt, Ph.D., *Research Scientist*
K. Lund, Ph.D., *Assistant Research Engineer*
L. Ni, Ph.D., *Assistant Research Engineer*
A. Strutt, Ph.D., *Assistant Project Scientist*
J. L. White, Ph.D., *Research Engineer*
S. Zargaryan, Ph.D., *Associate Research Engineer*

The instructional and research programs are grouped into six major areas: aerospace engineering, chemical engineering, materials science, mechanical engineering, structural engineering, and engineering physics. Both the undergraduate and graduate programs are characterized by strong interdisciplinary relationships with the Departments of Physics, Mathematics, Bioengineering, Chemistry, Economics, Electrical and Computer Engineering, Computer Science and Engineering, the Materials Science Program, and associated campus institutes such as the UCSD Center for Energy and Combustion Research, the Institute for Nonlinear Science, Institute of Geophysics and Planetary Physics, Institute for Pure and Applied Physical Sciences, Institute for Biomedical Engineering, Institute for Mechanics and Materials, Center for Magnetic Recording Research, Center of Excellence for Advanced Materials, California Space Institute, and Scripps Institution of Oceanography.

The programs and curricula of AMES build upon education on the fundamentals of engineering sciences. These principles provide a common foundation for all engineering subspecialties. Education with this emphasis is intended to serve students well during a career in which engineering practice may change rapidly.

The Undergraduate Program

Degree and Program Options

AMES offers traditional ABET accredited engineering programs leading to the **B.S. degree in engineering** with options in chemical engineering, mechanical engineering, and structural engineering. AMES also offers traditional nonaccredited engineering programs leading to the B.S. degree in aerospace engineering and engineering science. The B.S. programs require a minimum of 192 units.

All AMES programs of study have strong components in laboratory experimentation, numerical computation on computers, and engineering design. Design is emphasized throughout the curricula by use of open-ended homework problems, by exposure to industrial engineering problems in lectures, 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 AMES 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.

Chemical engineering is a traditional curriculum encompassing studies in organic and physical chemistry, fluid mechanics, heat and mass transfer, separation processes, and reactor and plant design. Many chemical engineering students pursue M.S. or Ph.D. degrees, but most seek employment at the B.S. level. They are employed not only in the traditional petrochemical, food, and polymers industries but also in high-technology industries such as biotechnology, electronics, and aerospace, and emerging fields such as environmental engineering.

Mechanical engineering is a traditional four-year curriculum in mechanics, vibrations, thermodynamics, fluid flow, heat transfer, structures, materials, control theory, and mechanical design. Graduates of this program may find employment in the mechanical and aerospace industries as well as diverse electromechanical or biomedical industries. Mechanical engineers are involved with various material processing, manufacturing, assembling, and maintenance of life-line facilities such as power plants.

Mechanical design activities include conceptual design, development of solid models by using 3D CAD programs, stress, dynamics, heat transfer, or fluid dynamics analyses, design and development of a sensor system, and the control of the total system for superior performance and customer satisfaction.
Manufacturing activities include efficient and economical processing by utilizing numerical control (NC) of machine tools, mechatronics, micro-machining, and rapid prototyping.

Mechanical engineers design highly flexible machine systems for manufacturing and material processing by utilizing intelligent process systems such as computers, process models, and sensors to improve the quality and productivity of the manufacturing lines. In order to meet the above challenges, the mechanical engineering curriculum emphasizes CAD courses, computer courses, laboratory courses, and senior design courses which are combined into science-based courses to have solid, hands-on experiences guided by applicable theories.

Structural engineering is concerned with the design and analysis of civil, mechanical, aerospace, and ocean structures. Examples include bridges, dams, buildings, aircraft, spacecraft, ships, oil platforms, automobiles, and other transportation vehicles. This field requires a thorough knowledge of linear and nonlinear behavior of solids (concrete, soils, rock, metals, composite materials, and plastics), 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 material behavior and structural performance is enhanced by laboratory courses involving static and dynamic stress and failure tests of structural models.

Aerospace engineering is a 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 will normally enter the aerospace industry to develop aircraft and spacecraft, but also may find employment in other areas that use similar technologies, such as mechanical and energy-related fields. Examples include automobile, naval, and sporting equipment manufacturers.

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 AMES or other science courses as technical electives.

Other Undergraduate Programs of Study in AMES

The **engineering mechanics minor** involves successful completion of a total of six AMES courses, including selected upper-division courses open to pre-AMES students who meet the course prerequisites: one must be 121A; one must be 101A (or 103A) or 130A (or both may be taken); and the balance must be selected from AMES 9 or 10, 11, 15, 102, 110, 111, 121B, 153 and 163. 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 or double major options are restricted. Students wishing to arrange a sequence of AMES courses to satisfy minor or double major requirements, or to meet particular academic interests, must consult the AMES Student Affairs Office for referral to the appropriate AMES faculty member.

Program Accreditation

The B.S. programs in chemical engineering, mechanical engineering, and structural 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 AMES 195, 197, and 198 are not allowed as technical electives in meeting the upper-division major requirements. AMES 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 AMES 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, most AMES 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 AMES 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 five 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 AMES 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 would 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 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 your local Board of Registration for Professional Engineers and Land Surveyors.

Four-Year Programs in Engineering

***Students who start their preparation in mathematics with Math. 20A in the fall quarter of their freshman year must complete the mathematics sequence in the following order: Math. 20A (F), Math. 20B (W), Math. 21C (S), Math. 21D (F), Math. 20F (W), and Math. 20E (S). Students with advanced placement starting with Math. 20B in the fall quarter of their freshman year can complete the sequence in the following order: Math. 20B (F), Math. 20C (W), Math. 20D (S), Math. 20E (F), and Math. 20F (W).**

Two computer languages, C/C++ (AMES 9) and FORTRAN (AMES 10) are offered to AMES students but only one course is required. FORTRAN (AMES 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++ (AMES 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 (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 9 or 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A*[2]	Chem. 6B/6BL	AMES 11
HSS[1]	HSS	HSS
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C/2CL	AMES 15	AMES 130A
AMES 121A	AMES 121B	HSS
HSS	HSS	HSS
JUNIOR YEAR		
AMES 105	AMES 102	AMES 170
AMES 163	AMES 110	AMES 121C
AMES 130B	AMES 154	Math. 183
HSS	HSS	HSS
SENIOR YEAR		
AMES 101A	AMES 101B	AMES 101C
TE[3]	AMES 171A	AMES 171B
AMES 141	TE[4]	TE[3]
AMES 158	AMES 156A	AMES 156

* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

[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] Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

[3] One technical elective (TE) must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics; the other TE must be selected from a list of approved energy, thermo-science courses available in AMES' student affairs office. Both must be selected with **prior** approval of the department to meet ABET standards.

[4] TE restricted to AMES 157, a second energy or thermal science TE to meet ABET standards.

Structural Engineering (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 9 or 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A*[1]	AMES 15	AMES 11
HSS[2]	HSS	HSS
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C/2CL	HSS	HSS
HSS	AMES 102	AMES 110
AMES 121A	AMES 121B	AMES 130A

JUNIOR YEAR		
AMES 105	AMES 163	AMES 170
AMES 130B	AMES 130C	AMES 121C
AMES 154	AMES 132A	AMES 132B
HSS	HSS	HSS
SENIOR YEAR		
Math. 120A	AMES 135	Math. 183[3]
AMES 103A	AMES 131A[4]	TE[5]
AMES 133	AMES 158	AMES 136[6]
AMES 134	AMES 173	HSS

* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

1 Chem. 7A may be taken in place of Chem. 6A.

2 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 sub jects such as accounting, industrial management, finance, or personnel administration. Ten HSS courses are listed here; individual college requirements may be higher.

3 Math. 183 may be replaced by AMES 139.

4 Students pursuing aerospace structures may take AMES 138 in lieu of AMES 131A.

5 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.

6 Students pursuing aerospace structures may take AMES 137 instead of AMES 136. Civil structures students may replace AMES 136 with other structural design courses with prior department approval.

Chemical Engineering (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 9 or 10	Phys. 2A*	Phys. 2B*
Chem. 6A*	Chem. 6B/6BL	Chem. 6C/6CL
HSS[1]	HSS	HSS
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C/2CL	AMES 111	AMES 153
Chem. 131	Chem. 132	Chem. 128[2]
HSS	HSS	Chem 105A
JUNIOR YEAR		
Chem. 141A	Chem. 141B	Chem. 143A
AMES 103A	AMES 163	AMES 170
HSS	AMES 103B	AMES 103C
HSS	HSS	HSS
SENIOR YEAR		
AMES 112	AMES 114A	AMES 114B
AMES 113A	AMES 113B	TE
AMES 140	AMES 176A	AMES 176B
HSS	TE[3]	TE

* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

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 Chem. 128 may be replaced by Chem. 133.

3 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 to meet ABET standards.

Engineering Science

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 9 or 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A*[2]	Chem. 6B/6BL	AMES 11
HSS[1]	HSS	HSS
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C/2CL	AMES 15	HSS
AMES 121A	AMES 121B	AMES 130A
HSS	HSS	HSS
JUNIOR YEAR		
AMES 101A	AMES 163	AMES 121C
AMES 130B	AMES 101B	AMES 101C
AMES 154	AMES 110	AMES 170
HSS	HSS	HSS
SENIOR YEAR		
AMES 158	AMES 171A	Math. 183
TE[3]	TE	TE
TE	TE	TE
HSS	HSS	HSS

* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

1 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.

2 Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

3 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 nonscience courses may also be selected with **prior** approval (see program description).

Aerospace Engineering

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 9 or 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A*[2]	Chem. 6B/6BL	AMES 11
HSS[1]	HSS	HSS
SOPHOMORE YEAR		
Math. 21D*	Math. 20F*	Math. 20E*
Phys. 2C*/2CL	AMES 15	AMES 130A
AMES 121A	AMES 121B	AMES 110
HSS[1]	HSS	HSS
JUNIOR YEAR		
AMES 163	AMES 102	AMES 121C
AMES 130B	AMES 154	AMES 170
AMES 101A	AMES 101B	AMES 101C
AMES 105	HSS	HSS
SENIOR YEAR		
HSS	TE	AMES 159
AMES 104	AMES 175A	AMES 175B
AMES 141	AMES 142	HSS
AMES 137	AMES 155A	AMES 155B

* Six of the eight courses used to compute the performance index upon which pre-engineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

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 Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

Policies and Procedures for AMES Undergraduate Students

Application for Admission to the Major

Because of the heavy student interest in AMES programs and the limited resources available to accommodate this demand, maintenance of a quality educational program makes it necessary to limit enrollments to the most qualified students. Admission to the department as an AMES major or minor, or to fulfill a major in another department which requires AMES 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 "Admission to the 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. Students not admitted directly to an engineering major are identified

as pre-engineering majors and may be admitted by petition to the department. The Undergraduate Affairs Committee judges these petitions, taking into consideration the student's entire academic record. Pre-AMES students should complete the following courses during their freshman year and apply for admission during the spring quarter of their freshman year:

1. Math. 20A, 20B, and 21C (or Math. 20B, 20C, and 20D for those starting with Math. 20B in fall).
2. Phys. 2A and 2B
3. Chem. 6A or 7A
4. Any two additional courses in science, mathematics, or engineering. One of them must be engineering.

Pre-engineering majors who have achieved an average GPA of 2.8 or better in the eight required pre-engineering courses by the end of the freshman year are assured of admission. Pre-engineering majors whose GPA is less than 2.8 may inquire at the departmental advising office about current minimum GPA requirements in effect for each major, which may vary due to enrollment. Students not admitted to a major by the end of the freshman year must apply, or reapply in the case of denial, before the end of the sixth quarter of study at UCSD. Pre-AMES students denied admission to an AMES major will automatically have their major converted from "Pre-AMES" to "Undeclared" by the department at the time of their denial. It is expected that students have completed or have in progress all eight prerequisite courses when applying by the third quarter. Ten or more courses must be completed if applying after the third quarter.

Transfer Students

Requirements for admission as an AMES major or minor, or into AMES courses, are the same for transfer students as they are for continuing students (see section on "Admission to the School of Engineering" in this catalog). Accordingly, when planning their program, transfer students should be mindful of lower-division prerequisite course requirements upon which admission to the major is based, 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. This is accomplished by submitting a petition for transfer credit together with a transcript and catalog course description from the institution where the course(s) were taken. These documents are reviewed for approval by AMES' Undergraduate Affairs Committee. Transfer petitions are available from the Student Affairs Office. Transfer students must apply for admission before the end of the third quarter of study at UCSD and must have completed at least three required AMES courses, one of which must be an upper-division course.

Academic Advising

Upon admission to the major, students must make an appointment with the undergraduate adviser in AMES' 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 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.

Most AMES 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 AMES 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 AMES faculty members. A specific AMES faculty adviser is assigned to each AMES or Pre-AMES student.

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 AMES Undergraduate Affairs Committee before the courses in question are taken. Petition forms may be obtained from the AMES Student Affairs Office and must be processed through this office.

Independent Study

AMES students may take AMES 199, Independent Study for Undergraduates, under the guidance of an AMES 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 an AMES 199 as Technical Elective Contract form to the 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 AMES 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 AMES. Before the last quarter of their junior year (during the fourth quarter *prior* to the receipt of the B.S. degree), students interested in obtaining the M.S. degree within one year following receipt of the B.S. degree may apply to the department for admission to the program.

(Contact the Department of AMES Graduate Student Affairs Office.)

The program is open only to UCSD undergraduates. The Department of AMES does not have financial assistance available for students enrolled in this program.

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 AMES 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 an AMES 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.

Graduate Program

The Department of Applied Mechanics and Engineering Sciences 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, chemical engineering, engineering physics, mechanical engineering, and structural engineering. The department, in collaboration with the Department of Electrical Engineering and Computer Sciences and the School of International Relations and Pacific Studies, also offers a M.S. degree in engineering sciences with specialization in advanced manufacturing. For more information on this option, please refer to page 00.

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.

Students are welcome to seek enrollment in AMES courses via UC Extension's concurrent registration program, but an extension student's enrollment in an AMES 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, chemical engineering, and engineering physics programs (see sample program below). Course requirements for the aerospace engineering, mechanical engineering, and structural engineering programs are outlined in the M.S. program charts below. 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 AMES 200-level courses.
2. Units obtained in AMES 206, 259, 281, or 299 may not be applied toward the course work requirement.
3. No more than a total of eight units of AMES 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 AMES 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 AMES 200-level courses.
2. Units obtained in AMES 206, 259, 281, or 299 may not be applied toward the degree requirements.

3. No more than a total of eight units of AMES 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 Aim. 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 the Committee on Graduate Affairs (CGA). The committee will appoint three AMES faculty to examine the applicant in one mutually agreed-upon and well-defined topic. The results of this examination, together with any other relevant information, e.g., the student's graduate record, will form the basis for a positive or negative recommendation to the CGA. 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 four 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 the Committee on Graduate Affairs. In this case, a special examination is not required. The application, however, must be approved and signed by an AMES 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 four 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 in Aerospace Engineering

To obtain an M.S. degree with specialization in aerospace engineering, students must select any four of the following five sequences of classes.

FALL	WINTER	SPRING
Fluid Mechanics 210A	Fluid Mechanics 210B	Fluid Mechanics 210C
Foundations of *or* Solid Mechanics 231A *or* Advanced *Structural* Analysis 230	Elasticity 231B *or* Structural Stability 236	Anelasticity 231C *or* Structural Dynamics 237 *or* Mechanics of *Laminated* Composite Structures 241
Numerical Methods Science and Engineering 290A	*Computational* Fluid Dynamics 223 *or* Finite-Element Methods Solid Mechanics 232B	Design and Mechanics in Computer Technology 291 *or* Computer-aided Analysis and Design 292
Statistical Thermodynamics 220A	Introductory Compressible Flow 212A	Mechanics of Propulsion 213
ECE 176A *or* ECE 176A *or* ECE 271A *or* ECE 273A	ECE 171A *or* ECE 175 *or* ECE 271B *or* ECE 273B	ECE 171B *or* ECE 173 *or* ECE 271C *or* ECE 273C

NOTE: Not all courses are offered every year.

M.S. Program in Chemical Engineering

FALL	WINTER	SPRING
Fluid Mechanics 201A	Fluid Mechanics 201B	Fluid Mechanics 201C
Heat and Mass Transfer 221A	Heat and Mass Transfer 221B	Chemical Reaction Engineering 252 *or* Heterogeneous Catalysis 253
Numerical Methods 290A	Numerical Methods 290B	TE[1]
Chem. 211 *or*[2] MATS. 201A *or* AMES 211	Chem. 211 *or* MATS. 201A *or* AMES 212 *or* 220A	Chem. 213 *or* MATS. 201C *or* AMES 213 *or* 220B

NOTE: Not all courses are offered every year.

[1] Consult faculty adviser on the choice of elective course to complement with the fourth course sequence.

[2] The recommended course sequences are biochemistry, materials science, and energy/thermal science. Consult faculty adviser on additional choices or alternatives, including special areas in bioengineering, electrical and computer engineering, physics, and mathematics.

M.S. Program in Mechanical Engineering

FALL	WINTER	SPRING
Foundations of Solid Mechanics 231A *or* Fluid Mechanics 210A	Elasticity 231B *or* Fluid Mechanics 210B	Anelasticity 231C *or* Fluid Mechanics 210C
Finite Element Methods in Solid Mechanics 232A *or* Numerical Methods in Science and Engineering 290A	Finite Element Methods in Solid Mechanics 232B *or* Numerical Methods for Differential Equations 290B	Finite Element Methods in Solid Mechanics 232C *or* Computational Fluid Dynamics 223
Fracture Mechanics 233A *or* Materials Science[1]	Micromechanics 233B *or* TE[2]	Adv. Mech. of Composite Materials 233 C *or* Des. and Mech. in Computer Technology 291 *or* Computer-Aided Des. and Anal. 292
ECE 176A *or* ECE 176A *or* ECE 271A *or* ECE 273A	ECE 171A *or* ECE 175 *or* ECE 271B *or* ECE 273B	ECE 171B *or* ECE 173 *or* ECE 271C *or* ECE 273C

NOTE: Not all courses are offered every year.

[1] To be selected from graduate course offerings in materials science.

[2] AMES graduate courses selected must be approved by the student's faculty adviser.

M.S. Program in Applied Ocean Sciences

To obtain an M.S. degree with specialization in applied ocean sciences, students may substitute some of the courses in the M.S. program in mechanical engineering with courses taken

at Scripps Institution of Oceanography. These courses might include SIO 211A-B (Ocean Waves), SIO 212A-B (Dynamic Oceanography), SIO 204A-B-C (Advanced Acoustics), SIO 213/ AMES 214A (Ocean Turbulence and Mixing), and SIO 219 (Special Topics in Physical Oceanography), depending on the interests of the student.

*M.S. Program in Structural Engineering**

FALL	WINTER	SPRING
Foundations of Solid Mechanics 231A	Elasticity 231B	Anelasticity 231C
Advanced Structural Analysis 230 *or* Theory of Shells 235A	Structural Stability 236 *or* Theory of Shells 235B	Structural Dynamics 237 *or* Mechanics of Laminated Composite Structures 241
Advanced RC/PC Design 240 *or* Fracture Mechanics 233A	Bridge Design 242 *or* Micromechanics 233B	Advanced Structural Steel Design 245 *or* Advanced Mechanics of Composite Materials 233C
Applied Mathematics 105 *or* 294A	Finite Element Methods in Solid Mechanics 232B	Experimental Mechanics 234 *or* Independent Study 296

* Includes civil structures and aerospace and marine structures.

NOTE: Not all courses are offered every year.

The AMES 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 AMES 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 AMES 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 AMES' Student Affairs Office.

Doctoral Examinations: An AMES Ph.D. student is required to pass three examinations. The first is a **Departmental Qualifying Examination** which should be taken within three to six quarters of full-time graduate study. This examination is intended to determine the candidate's ability to pursue successfully a research project at a level appropriate for the doctorate. It is administered by at least four faculty, three of whom must be in AMES. Although the student may elect to satisfy one examination area by course work, he or she is responsible for four areas. In order to insure appropriate breadth, the areas are sub-divided into two which are closely related to the student's research interests and two others which are peripheral thereto. Since the examination areas must be approved by the department's Committee on Graduate Affairs, 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 examination, the scope of the examination in each area is associated with a set of graduate courses, generally AMES courses. Thus 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 **Teaching Experience** is required of all AMES 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 (AMES 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 AMES 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 thesis research. 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 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 Applied Mechanics and Engineering Sciences 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.

COURSES

All students enrolled in AMES courses or admitted to an AMES program (including premajors) are expected to meet prerequisite and performance standards, i.e., students may not enroll in any AMES 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 AMES 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 AMES 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, most AMES 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, AMES 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

5. Quantitative Computer Skills (4)
Introductory course for nonengineering majors. Use of computers in solving problems; applications from life science, physical science, and engineering. Students run existing computer programs and complete some programming in BASIC. (F,W,S)

9. C/C++ Programming (4)
C/C++ computer programming under UNIX environment with applications to numerical problems fundamental to computational mechanics. Arithmetic operations, branches, arrays, data structures, and use of pointers are introduced. Introduction to C/FORTRAN bindings to enable C codes to call FORTRAN routines and vice versa. (F,W)

10. FORTRAN for Engineers (4)
FORTRAN computer programming language and its application to the solution of numerical problems. Command and editing in the interactive mode. Emphasis on good programming practices. Priority enrollment given to pre-engineering and engineering majors. (F,W)

11. Elements of Materials Science (4)
The structure of engineering materials (metals, ceramics, glasses, semiconductors, superconductors, and polymers) and how these structures can be controlled to produce desired, useful properties. Mechanical, electrical, optical, superconducting, and magnetic properties will be discussed. *Prerequisites: Chem. 6A, Phys. 2A or 3A, Math. 21C or Math. 20D (or concurrent enrollment).* Priority enrollment given to pre-engineering and engineering majors. (F,S)

15. Introduction to Engineering Graphics and Design (4)
Introduction to engineering graphics and computer-aided design (CAD). Engineering graphics topics include orthographic, oblique, and axonometric projections; auxiliary and sectional views; and dimensioning. AutoCAD and C programming assignments for 2-D graphics and solid modeling. Guest lectures on engineering design. *Prerequisites: grade of C– or better in AMES 9 or 10. Enrollment restricted to pre-engineering and engineering majors.* (W,S)

90. Undergraduate Seminar (1)
Selected topics of interest to the faculty will be used to introduce students to engineering science concepts. (Not open to upper-division engineering students.) (F,W,S)

UPPER-DIVISION

101A-B. Introductory Fluid Mechanics (4-4)
Hydrostatics with application to submerged surfaces and structure of atmospheres. Bernoulli's equation, its extension and application. Integral momentum and energy theorems, similitude and dimensional analysis. Potential flow, boundary layers, compressible flow including shock waves, generalized one-dimensional flow. *Prerequisites: admission to the major and grades of C– or better in Phys. 2A, Math. 21D or 20D, 20E. Enrollment in 101B requires grades of C– or better in AMES 101A and AMES 110 (or concurrent enrollment).* (F,W)

101C. Heat Transfer (4)
Extension of AMES 101A-B to viscous, heat-conducting flows. Application of the energy conservation equation to heat transfer ducts and external boundary layers. Introduction to heat conduction and radiation transfer. Calculation of heat coefficients in forced and free convection. Design applications and heat exchangers. *Prerequisites: admission to the major and AMES 101A-B with grades of C– or better.* (S)

102. Mechanical Behavior of Materials (4)
Mechanical tests, elasticity and anelasticity, dislocations and microplasticity of crystals, plastic deformation and creep, fracture and strengthening mechanisms, ceramics and other inorganic nonmetallics, polymers. Laboratory demonstrations of selected topics. *Prerequisites: grades of C– or better in AMES 11.* Priority enrollment given to pre-engineering and engineering majors. (W,S)

103A. Introductory Fluid Mechanics (4)
Equations of motion; non-Newtonian fluids; hydrostatics; Bernoulli's equation; viscous flows; turbulence, applications to chemical engineering, bioengineering, and structural engineering. (Students may not receive credit for both AMES 101A and AMES 103A; priority enrollment will be given to bioengineering, chemical engineering, and structural engineering majors.) *Prerequisites: admission to the major and grades of C– or better in Phys. 2A and Math. 21D or 20D, 20E.* (F)

103B. Mass Transfer (4)
Diffusive and convective mass transfer in solids, liquids, and gases; steady and unsteady state; mass transfer coefficients; applications to chemical engineering and bioengineering. (Priority enrollment will be given to bioengineering and chemical engineering majors.) *Prerequisites: admission to the major and AMES 103A or 101A with grade of C– or better.* (W)

103C. Heat Transfer (4)
Conduction, convection, radiation heat transfer; design of heat exchangers. (Students may not receive credit for both AMES 101C and AMES 103C; priority enrollment will be given to chemical engineering majors.) *Prerequisites: admission to the major and grades of C– or better in AMES 103A-B or AMES 101A-B.* (S)

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 major and grade of C– or better in AMES 101A-B.* (F)

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 the major and grades of C– or better in Phys. 2A-2B and Math. 20D or Math. 21D.* (F,S)

110. Thermodynamics (4)
Application of the first and second laws to power and refrigeration cycles; control volume analysis, non-ideal compressible substances; gas mixtures; psychometrics; combustion. *Prerequisites: grades of C– or better in Phys. 2C and Chem. 6A (or equivalent). Priority enrollment given to pre-engineering and engineering majors.* (W,S)

111. 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: admission to the major and grade of C– or better in Chem. 131.* (W)

112. 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 AMES 103B and AMES 153.* (F)

113A. Chemical Reaction Engineering (4)
Principles of analysis and design of chemical reactors with emphasis on homogeneous reactions. Treatment of kinetic data, design of batch and continuous reactors, nonisothermal effects, selectivity considerations, residence time distribution. *Prerequisites: admission to the major and grades of C– or better in Chem. 132 and AMES 103B.* (F)

113B. Chemical Reaction Engineering (4)
Introduction to heterogeneous chemical reactions, including heterogeneous catalysis, heat and mass transfer effects. Strong emphasis on numerical simulation and computer-aided design of chemical reactors. *Prerequisites: admission to the major and grades of C– or better in AMES 113A.* (W)

114A. Computer-Aided Design of Chemical Processes (4)
Introduction to techniques for computer-aided analysis of chemical processing systems. Development of mathematical models to describe dynamic and steady-state process behavior. Representation of the structure of complex, interconnected chemical processes with arbitrary recycle stream. Numerical methods for solving resulting systems of nonlinear differential and algebraic equations. *Prerequisites: admission to the major and grades of C– or better in AMES 112, 113A.* (W)

114B. Plant and Process Design (4)
Engineering and economic analysis of integrated chemical processes, equipment, and systems. Cost estimation, heat and mass transfer equipment design and costs. Integrated plant design. Optimal design. Profitability. *Prerequisites: admission to the major and grades of C– or better in AMES 114A.* (S)

119A. Thermodynamics Systems (4)
Examination of entropy production and energy costs in power plant cycles; component and cycle efficiencies; economic costs and constrained optimization to minimize fuel costs for fixed power output. *Prerequisites: grades of C– or better in AMES 110 or 111.* (F)

119B. Energy: Non-Nuclear Energy Technologies (4)
Oil recovery from tar sands and oil shale. Coal production, gasification, liquification. The hydrogen economy. Energy storage systems. Techniques for direct energy conversion. Solar energy utilization. Energy from windmills. Tidal and wave energy utilization. Hydroelectric power generation. Hydrothermal energy. Geothermal energy from hot rocks. Electrical power production, transmission, and distribution. *Prerequisite: consent of instructor.* (S)

119C. Energy: Nuclear Energy Technologies (4)
A brief survey of energy demands and resources. Available nuclear energy, physical background–thermal dynamics–atomic and nuclear physics; fission and fusion processes, physics of fission reactions–engineering aspects–safety and environmental effects, fusion, scaling laws, and start-up criteria–laser fusion, magnetic confinement–equilibrium instability. *Prerequisite: consent of instructor.* (W)

121A. Mechanics I: Statics (4)
Principles of statics. Three-dimensional equilibrium analysis with unit vector representation. Analysis of simple, statically determinate structures under discrete and distributed loading; hydrostatics, internal forces of beams. Problem formulation and problem solution with application to realistic engineering problems. *Prerequisites: Math. 21C or Math. 20D and Phys. 2A, with grades of C– or better. Priority enrollment given to pre-engineering and engineering majors.* (F,W)

121B. Mechanics II: Dynamics (4)
Kinematics and kinetics of particles in three-dimensional vector representation; orbital mechanics. Work, energy and power for particle motion, conservative forces and conservation principles. Principle of impulse and momentum, impulsive motion and impact. Relative motion and conservation principles for systems of particles with variable mass; applications to fluid flow and rocket propulsion. Rigid body kinematics, rolling and sliding motions. Impact of rigid bodies. One-degree of freedom undamped vibrating systems resonance under sinusoidal excitation. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites: Math. 20D or 21D and AMES 121A with grades of C– or better. Priority enrollment given to pre-engineering and engineering majors.* (W,S)

121C. Mechanics III: Vibrations (4)
Free and forced vibrations of damped one-degree of freedom systems; vibration isolation, impact and packaging problems. Analysis of discrete multiple-degree of freedom systems using matrix representation; normal mode of frequencies and modal matrix formulation. Applications include response of buildings to ground motion. Lagrange's equations. Modal superposition for analysis of continuous vibrating systems. Problems of elastic bars and beams include free, impact-excited and sinusoidally forced vibrations. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites: admission to the major and grades of C– or better in Math. 20F and AMES 121B.* (F,S)

130A. Solid Mechanics I (4)
Mechanics of deformable bodies under axial, torsional, shearing, and bending loads. Elastic and plastic uniaxial material response as well as three-dimensional 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 or 21D, 20F; and AMES 121A. Priority enrollment given to pre-engineering and engineering majors.* (F,S)

130B. 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 major and grades of C– or better in AMES 130A, and 105 (or concurrent enrollment).* (F,W)

130C. 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 major and grade of C– or better in AMES 130B.* (W)

131A. Soil Mechanics (4)
General introduction to physical and engineering properties of soils. Soil classification and identification methods. Soil exploration, sampling, and in-situ testing techniques. Permeability, seepage, and consolidation phenomena. Bearing capacity equations, stress distribution, and settlements. Lectures, three hours per week; lab, three hours per week. *Prerequisites: admission to the major and grades of C– or better in AMES 130A-B.* (W)

131B. Foundation Engineering (4)
Application of soil mechanics to the analysis, design, and construction of foundations for structures. Settlement of structures, bearing capacities of shallow and deep foundations; earth pressures on retaining structures and slope stability. *Prerequisites: admission to the major and grade of C– or better in AMES 131A.*

132A-B. Structural Analysis (4-4)
Step-by-step development of computer codes for the analysis of civil, mechanical, and aerospace structures from the matrix formulation of the classic structural theory, through the direct stiffness formulation, to production-type structural analysis programs. *Prerequisites: admission to the major and grade of C– or better in AMES 130A, AMES 154. AMES 132A for 132B.* (W,S)

133. Finite Element Methods (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 codes. *Prerequisites: admission to the major and grades of C– or better in AMES 130A-B and 154.* (F)

134. Structural Design Principles–Application to 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. Introduction to plastic design. (Priority enrollment given to structural engineering majors.) *Prerequisites: admission to the major and grade of C– or better in AMES 132A.* (F)

135. Analysis and Design of Reinforced Concrete Structures (4)
Principles and general code provisions for reinforced concrete design. Concrete and reinforcement properties. Design of concrete members, including beams, slabs, and columns. Bond, anchorage, and detailing problems. Design, behavior, and serviceability of reinforced concrete structures. Introduction to seismic design principles. (Priority enrollment given to structural engineering majors.) *Prerequisites: admission to the major and grades of C– or better in AMES 132A-B and 134.* (W)

136. Design of Prestressed Concrete Structures (4)
Concept of prestressing. Materials and prestressing systems. Design of prestressed concrete members. Statically determinate and indeterminate structural systems. Prestress losses and time dependent effects. Application of prestressed concrete for buildings, bridges, and shells. Prestressing for the rehabilitation of structures. Determination of stress states and stronger design criteria. (Priority enrollment given to structural engineering majors.) *Prerequisites: admission to the major and grade of C– or better in AMES 135.* (S)

137. 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, in-

troduction of matrix methods for structural dynamics and buckling. *Prerequisites: admission to major and grade of C– or better in AMES 121C and AMES 130A-B.* (F)

138. 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: admission to the major and grade of C– or better in AMES 121C and AMES 130A-B.* (S)

139. Reliability of Engineering Systems (4)
Introduction to probability and basic statistics. Analytical models for random phenomena and associated mathematical properties. Analysis and assessment of reliability. Probability-based design. Structural component and systems reliability. *Prerequisites: admission to the major and grades of C– or better in Math. 21C or Math. 20D, Math. 20E, and AMES 132A-B.* (Not offered in 1996–97.)

140. Chemical Process Dynamics and Control (4)
Optimum steady-state design and control. Dynamical behavior of chemical process units such as chemical reactors, separation units, and heat exchangers. Examination of linear, linearized, and nonlinear process models. Stability analysis. Design of simple PID controllers. Bode diagrams and root locus techniques. Introduction to multivariable control systems. Cascade, modal, and feed-forward control. Selection of control and measurement variables. (Students may not receive credit for both AMES 140 and 141A.) *Prerequisites: admission to the major and grades of C– or better in Math. 21C or Math. 20D.* (F)

141. Linear Control: Theory and Applications (4)
Analysis and design of controllers for linear dynamic systems. Transient and steady-state behavior are analyzed using transfer functions and Laplace transforms. Stability is assessed via the root locus, Bode, and Nyquist plots. P.I.D. and other compensators. State variables are briefly introduced. Examples are selected from Mechanical and Aerospace Engineering. *Prerequisites: admission to the major and C– or better in AMES 105 (may be concurrent) and AMES 163.* (F)

142. Flight Mechanics (4)
Theory of flight, airfoil, lift, drag, applied aerodynamics. Static stability and its relation to airplane performance and design. The mathematics of translation and rotation in three-dimensions. Dynamic stability–general and simplified equations of motion. Stability derivatives. Characteristic longitudinal and lateral motions. Design of autopilots. *Prerequisites: admission to the major and grade of C– or better in AMES 104 and AMES 141.* (W)

144A. Space Science and Engineering I (4)
Introduction to space science. Earth, planetary atmospheres, especially upper atmospheres. Magnetospheres, energetic particles. Electromagnetic spectrum. Atmospheric attenuation, windows. Detection methods, instruments. Imaging systems, image processing. Observations from space. Newtonian mechanics of bound orbits. Science on manned, unmanned missions. *Prerequisites: upper-division standing in physics, chemistry, or engineering department.*

144B. 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. *Prerequisites: upper-division standing in physics, chemistry, or engineering department.*

151A-Z. 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 by visiting or resident faculty members. *Prerequisite: admission to the major or consent of instructor.* (F,W,S)

152. Topics in Engineering Design (4)
A course to be given at the discretion of the faculty in which topics of current interest in applied engineering design will be investigated by resident faculty members or by practicing engineers. Priority enrollment for particular design courses may be given to students in the appropriate degree program. *Prerequisite: admission to the major or consent of instructor.* (F,W,S)

153. Numerical Methods in Chemical Engineering (4)
Introduction to elementary numerical methods and advanced FORTRAN programming, with applications to chemical engineering problems. Structured software strategy. Approximations and errors introduced in computations. Systems of linear equations and ordinary differential equations, root finding, finite difference, least square and spline fits. Concepts of mathematical modeling, material and energy balances of single and staged unit operations with applications to design problems. *Prerequisites: admission to the major and grades of C– or better in AMES 9 or 10, AMES 111.* (S)

154. Numerical Methods in Engineering (4)
This course discusses numerical methods for applications for engineering problems. Topics include 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: admission to the major and grades of C– or better in AMES 9 or 10 and Math. 20F.* (F,W)

155A-B. Aerospace Engineering Design (4-4)
Fundamental principles of design in aerospace engineering. Trade-off studies in aerospace design by application of pertinent technical areas, including structures, aerodynamics, propulsion, and flight mechanics. Project involving the preliminary design for an aircraft, spacecraft, or propulsion system. *Prerequisites: admission to the major and grade of C– or better in AMES 104, 137; AMES 142 and 159 may be taken concurrently.* (W,S)

156A-B. Mechanical Engineering Design I, II (4-4)
Fundamental principles of mechanical design. Application of engineering mechanics to the design of mechanical components. Design project involving a preliminary design for a realistic engineering application. (Priority enrollment given to mechanical engineering majors.) *Prerequisites: admission to the major and grades of C– or better in AMES 11 or 102, 15, 121A-B, and 130A. Enrollment in 156B requires grades of C– or better in 156A and 158 (or concurrent enrollment). 156A:* (F,W); *156B:* (W,S)

157. Computer Graphics for Engineers and Scientists (4)
Computer graphics algorithms studied using the C programming language and also by use of the computer-aided design software package AutoCAD. Applications in engineering and science. Topics include line-drawing algorithms, color, the user interface in CAD, spline curves and surfaces, 2-D and 3-D transformations, 3-D viewing, wireframe and solid models, and hidden-surface elimination. Weekly computer laboratory assignments plus a final graphics design project. *Prerequisites: admission to the major and grade of C– or better in AMES 15; college-level programming course in C or FORTRAN.* (F,S)

158. Computer-Aided Analysis and Design (4)
The use of computers for the design and analysis of engineering systems. *Prerequisites: admission to the major and grade of C– or better in AMES 130B, 154, and concurrent enrollment in AMES 101A or AMES 103A.* (F,W)

159. Fundamentals of Gas Turbines (4)
Compressible flow, thermodynamics, and combustion relevant to gas turbine technology. Analysis and design of components of both stationary power plant turbines and turbines for aircraft propulsion, including compressors, turbines, inlets, combustion chambers, and nozzles. Design projects will include component matching. (Priority enrollment given to mechanical engineering majors.) *Prerequisites: admission to the major and grades of C– or better in AMES 110 or 111 and AMES 101A-B-C or 103A-B-C.* (S)

163. Linear Circuits (4)
Steady-state and dynamic behavior of linear, lumped-parameter systems, including electrical, mechanical, and thermal systems. Kirchoff's laws. RLC circuits. Amplifiers. Dependent sources. Response of first- and second-order systems to impulse and step inputs. Laplace transforms. Design applications in engineering. *Prerequisites: admission to the major and grades of C– or better in Math. 21D or Math. 20D, Math. 20F and Phys. 2B.* (F,W)

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. *Prerequisites: grade of C– or better in AMES 163, and junior standing in major, and Phys. 2CL.* (F,S)

171A-B. Mechanical Engineering Laboratory (4-4)
Design and analysis of experiments in fluid and solid mechanics using large facilities, e.g., pipe flow systems, wind tunnels, water channels, vibration table, testing machines. Students operate facilities, obtain data, complete engineering analysis, and write major reports. (Priority enrollment given to mechanical engineering, engineering science, and applied mechanics majors.) *Prerequisites: grade of C– or better in AMES 170 and senior standing in major. Enrollment in 171B requires a grade of C– or better in 101A or 103A and 171A.* (W,S)

173. Structures and Materials Laboratory (4)
Introduction to instrumentation and testing techniques for structures under static and dynamic loads. Discussion of standard tension and compression tests for structural materials. Similitude relationships for structural models. Term project involving design, construction, testing, and data acquisition of a model structure. Preparation of a complete engineering report on the theory, design, and results of the term project. Observation and discussions of ongoing large-scale structural research projects in the Charles Lee Powell Structural Systems Laboratory. (Priority enrollment given to structural engineering majors.) *Prerequisites: grade of C– or better in AMES 170 and senior standing in the major.* (W)

175A-B. Aerospace Engineering Laboratory (4-4)
Design and analysis of aerospace engineering experiments, using large facilities (as wind tunnels, testing machines, vibration tables, heat transfer apparatus) in areas related to mechanics, gas dynamics, thermodynamics, and heat transfer. Students propose and design experiments, complete engineering analysis, and write major reports. *Prerequisites: admission to the major, a grade of C– or better in AMES 170, 101A-B, and senior standing in the major.* (W,S)

176A-B. Chemical Engineering Process Laboratory (4-4)
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. 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 ap-

plied chemical technology and engineering operations related to mass, momentum, and heat transfer. (Priority enrollment given to chemical engineering majors.) *Prerequisites: 176A requires grades of C– or better in AMES 112, and 113A for 176A; and C– or better in AMES 176A for 176B.* (W,S)

195. Teaching (2-4)
Teaching and tutorial assistance in an AMES course under supervision of instructor. Not more than four units may be used to satisfy graduation requirements. (P/NP grades only.) *Prerequisite: B average in major and consent of department chair.* (F,W,S)

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 availabiity 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. Units may not be applied towards major graduation requirements unless prior approval of a faculty adviser is obtained and internship is an unsalaried position. *Prerequisites: completion of ninety units with a 2.5 GPA and consent of AMES faculty coordinator.* (F,W,S)

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. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

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.* (F,W,S)

GRADUATE

205. Graduate Seminar (0)
Each graduate student in AMES is expected to attend a weekly seminar of his or her choice dealing with current topics in fluid mechanics, solid mechanics, systems science, applied ocean sciences, or energy. (S/U grades only.) (F,W,S)

206. Physical Principles and Problems (1)
Principles of applied science illustrated by problems in mechanics, dynamics, electricity, optics, thermodynamics, etc. Presentation of individual research. Preparation for interdepartment oral examination. (S/U grades only; course does not apply toward fulfillment of degree requirements.)

207A-Z. 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.*

210A-B-C. Fluid Mechanics (4-4-4)
Physical properties of fluids, kinematics; potential flow, wing theory; surface waves; Navier-Stokes equations; boundary layers; turbulence; heat and mass transfer. *Prerequisites: AMES 101A-B and AMES 110, 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: AMES 101A-B-C or AMES 103A-B-C, AMES 110, 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: AMES 101A-B-C or AMES 103A-B-C, AMES 110, 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: AMES 101A-B, AMES 110, or consent of instructor.*

214A. Introduction to Turbulence and Turbulent Mixing (4)
Introductory concepts and definitions. Basic observations and experiments. Hydrodynamic stability. Kolmogroff universal similarity hypotheses, length and time scales. Turbulent transport. Reynolds equations. Reynolds analogy. Dynamics of turbulence, kinetic energy, vorticity, temperature variance conservation. *Prerequisites: AMES 101A-B-C or equivalent or consent of instructor.*

214B. Introduction to Turbulence and Turbulent Mixing (4)
Universal similarity hypotheses of turbulent mixing; length, time, and scalar scales. Phenomenology of free shear flows and wall bounded flows. Statistical description of turbulence; transport, spectral dynamics, statistical geometry. *Prerequisite: AMES 214A or equivalent or consent of instructor.*

215. Hydrodynamic Stability (4)
Kelvin-Helmholtz inviscid 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: AMES 210A-C or equivalent.* (F)

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: AMES 110 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. *Prerequisites: AMES 101A-B-C or AMES 103A-B-C, AMES 220A or consent of instructor.*

220C. Nonequilibrium Gasdynamics (4)
Applications of thermodynamics, statistical mechanics, kinetic theory of gases and fluid mechanics to nonequilibrium flow problems. Shock structure. Chemical relaxation. Chemically reacting boundary layers. Ionized gases. Radiative heat transfer. *Prerequisite: AMES 220B or consent of instructor.*

221A-B-C. Heat and Mass Transfer (4-4-4)
Conduction, convection, and radiation heat transfer and mass transfer. Development of energy and species conservation equations. Analytical and numerical solutions to transport problems. Specific topics and applications may vary according to interests of instructor. (Not necessarily taught as a sequence nor offered every quarter.) *Prerequisites: AMES 101A-B-C or AMES 103A-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.) *Prerequisites: AMES 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: AMES 101A or equivalent course or consent of instructor.*

226A-B-C. Advanced Engineering Physics (4-4-4)
Contemporary problems in many areas of engineering physics. Examples include combustion, quantitative spectroscopy and opacity calculations, relaxation phenomena and nonequilibrium flows, propagation of electromagnetic radiation through matter, laser theory and kinetics, advanced radiative heat transfer, laser-induced photochemistry, etc. *Prerequisites: AMES 220A-B-C or consent of instructor.*

230. Advanced Structural Analysis (4)
Applications of advanced analytical concepts to structural engineering problems. The course is designed to show and emphasize the physical nature of the finite element method in structural engineering. Effects of approximations in the descretization and the type of finite elements under consideration are evaluated. An introduction is given to the nonlinear behavior of structural systems focusing on basic concepts and computational techniques. *Prerequisites: Courses in structural analysis and finite element theory such as AMES 132 and AMES 133 or equivalent 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: AMES 130B 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: AMES 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: AMES 231B or consent of instructor.*

232A-B-C. Finite Element Methods in Solid Mechanics (4-4-4)
Finite element methods for linear and nonlinear problems in solid mechanics. Basic methods and linear problems are discussed in the first quarter; dynamics, structural elements and material nonlinearities are discussed in the second quarter; and the third quarter emphasizes methods for problems with both material and geometrical (large deformations) nonlinearities. *Prerequisites: graduate standing for 232A-B; AMES 231A for 232C. AMES 230 or 232A for AMES 232B and AMES 232C.*

233A. Fracture Mechanics (4)
Theoretical strength; stress concentration. Linear fracture mechanics: stress singularity; fracture modes; stress field near a crack tip; energy method and energy release-rate; the J-integral. Nonlinear fracture mechanics: crack tip plastic zone; crack opening displacement; the Dugdale model; the R-curve, com-

pliance method; the shape of plastic zone; power-law materials; the J-integral and the effective stress intensity factor: perfectly plastic solid; slip-line theory and stress field at crack tip; stability consideration. Fatigue; special topics. *Prerequisites: AMES 231A-B or consent of instructor.*

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 and micromechanically based plasticity theories; microcracking, cavitation, and damage in crystalline and other solids, and the corresponding overall response and failure modes; selected topics. *Prerequisites: AMES 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. *Prerequistes: AMES 130A-B-C, 231A-B or consent of instructor.*

234. Experimental Mechanics (4)
Theory and technique of standard and newly developed methods; laboratory experience using modern instrumentation such as strain gauges, capacitive, piezoelectric and piezoresistive devices, and surface coatings, application of photoelasticity, laser interferometry, and holography to problems in static and dynamic elasticity and plasticity. Ultra-high-speed measurements will be emphasized. *Prerequisite: consent of instructor.*

235A-B. Theory of Shells (4-4)
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. *Prerequisites: AMES 130A-B-C 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: AMES 130B 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. *Prerequisites: AMES 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. *Prerequisites: AMES 231A-B-C or consent of instructor.*

239. Earthquake Engineering (4)
Introduction to plate tectonics and basic concepts in seismology including rupture mechanism, measures of magnitude and intensity, descriptions of earthquake occurrence and its relation to geologic and tectonic processes. Measurements and description of strong earthquake ground motion; site effects on ground motion. Response of structures to earthquake excitation; soil-structure interaction effects; full-scale testing of structures; design criteria and code requirements. *Prerequisites: AMES 231A-B, AMES 237 (or concurrent enrollment) or consent of instructor.*

240. Advanced Reinforced and Prestressed Concrete Design (4)
Advanced topics in concrete design, including frame and shear wall structures, are discussed. Special emphasis is given to the design of connections and to confinement and ductility requirements under seismic loads. Complete reinforced and prestressed concrete systems are evaluated for seismic resistance. Upper and lower bound theories for slab design are derived. Analysis and design of circular prestressed concrete structures are discussed. *Prerequisite: AMES 135, AMES 136 or equivalent background in basic RC/PC design or consent of instructor.*

241. 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: AMES 121C, 130B, 138 or equivalent.*

242. Bridge Design (4)
The course covers different aspects relevant to the design and the analysis of bridge structures. Construction methods and corresponding load conditions are investigated for various bridge types and geometries. Special problems in the analysis of box girder bridges, curved and skewed bridges and bridge structures under traffic loads, environmental, and seismic loads are discussed. Bearings and expansion joints are evaluated in connection with time and temperature dependent superstructure deformations. *Prerequisites: AMES 230 and fundamental courses in RC and PC design or consent of instructor.*

243. Masonry Structures (4)
Analysis and design of unreinforced and reinforced masonry structures, using advanced analytical techniques and design philosophies. Masonry material properties, stability, and buckling of unreinforced masonry. Flexural strength, shear strength, stiffness, and ductility of reinforced masonry elements. Design of masonry shear wall systems for seismic loads. *Prerequisites: AMES 135 or equivalent basic reinforced concrete course or consent of instructor.*

245. Advanced Structural Steel Design (4)
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 of steel structures. Ductility requirement for seismic design. Composite construction. *Prerequisites: AMES 230, AMES 134 or equivalent course or consent of instructor.*

251. Thermodynamics (4)
Principles of thermodynamics of single and multicomponent systems. Phase equilibria. Estimation, calculation, and correlation of properties of liquids and gases. *Prerequisite: consent of instructor.*

252. Chemical Reaction Engineering (4)
Analysis of chemical rate processes; complex kinetic systems. 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 heterogeneous reactor systems. *Prerequisite: consent of instructor.*

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.*

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.*

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.*

257A. Polymer Processing (4)
Analysis of flow fields encountered in major methods of polymer fabriction: extrusion, coating, fiber spinning, injection molding, mixing. *Prerequisite: consent of instructor.*

258. Special Topics in Chemical Engineering (4)
Directed study of some area of specialization not covered in depth in the regular course offerings. *Prerequisite: consent of instructor.*

259. Seminar in Chemical Engineering (1)
Presentations on research progress by graduate students and by visitors from industrial and academic research laboratories. (May be repeated for credit; S/U grades only; course does not apply toward fulfillment of degree requirements.) *Prerequisite: consent of instructor.*

261. Sensors and Measurements (4)
Manufacturing sensors and measurement systems, measurement techniques, modern metrology, statistical methods, and experiment design. *Prerequisite: none.*

262. Manufacturing Systems (4)
The manufacturing process as a system. Design, production, inspection, quality control, inventory control, material handling, and other functional engineering components. Information flow among components and the effect of components on the whole system. Statistical and process control techniques. *Prerequisite: none.*

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, introduction to ordinary differential equations. *Prerequisite: AMES 154 or consent of intstructor.*

290B. Numerical Methods for Differential Equations (4)
Numerical solution of differential equations in mathematical physics and engineering. Linear and nonlinear hyperbolic parabolic, and elliptic equations, with emphasis on prototypical cases described by the convection equation, the convection-diffusion equation, Laplace's and Poisson equation. Finite difference methods will be considered in depth, and additional topics will be drawn from spectral, finite-element and discrete-particle methods. *Prerequisite: AMES 290A.*

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; surface roughness; vibrations of rotating disks; introduction to actuator design, dimensional stability of substrate; instrumentation; experimental methods; impact printing; fluid jets; silicon micromechanics. *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 statis-

tics, non-repeatable spindle run-out, design and analysis of four bar linkages, beam deflection and vibration, design of magnetic head suspension, hydrodynamic theory of lubrication, design of air bearings, heat transfer in computer chips, optimization of 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 AMES 157, including color, computational geometry, 3-D contouring, volume visualization, and hardware architectures. *Prerequisite: AMES 157 or consent of instructor.*

294A-B-C. Methods in Applied Mechanics, I,II,III (4-4-4)
Various methods of analysis are covered with emphasis on application. Topics range over the broad fields of complex analysis, ordinary and partial differential equations (linear and nonlinear), asymptotic analysis, integral equations and weighted residuals. Specifics include Dirichlet and Neumann problems. Cauchy concepts. Green functions, Riemann mapping, eigenfunctions, phase-plane analysis, steepest descents, multiple scales. WKB method, matched asymptotic expansions, transform techniques, Fredholm theory. Wiener-Hopf method. Galerkin method. *Prerequisites: Math. 110, Math. 120A or consent of instructor.*

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 grades permitted.)

299. Graduate Research (1-12)
(S/U grades only.)

501. Teaching Experience (2)
Teaching experience in an appropriate AMES 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 AMES department.*

Bioengineering

STUDENT AFFAIRS:
4103 Engineering Building I, Warren College

Professors

S. Chien, M.D., Ph.D., *Chair; Director, Institute for Biomedical Engineering*
Y. C. Fung, Ph.D., *Professor Emeritus*
D. A. Gough, Ph.D.
M. Intaglietta, Ph.D.
B. O. Palsson, Ph.D.
G. W. Schmid-Schoenbein, Ph.D.
R. Skalak, Ph.D., *Professor in Residence; Director, Institute for Mechanics and Materials*
B. W. Zweifach, Ph.D., *Professor Emeritus*

Associate Professors

J. A. Frangos, Ph.D., *Associate Professor in Residence*
A. D. McCulloch, Ph.D.
L. A. Sung, Ph.D., *Associate Professor in Residence*

Assistant Professors

R. L. Sah, M.D., Sc.D.

Adjunct Faculty

P. C. Johnson, Ph.D.
S. S. Sobin. M.D., Ph.D.

Affiliated Faculty

P. C. Chau, Ph.D., *Associate Professor of Chemical Engineering*
J. W. Covell, M.D., *Professor of Medicine and Bioengineering*
M. H. Ellisman, Ph.D., *Professor of Neurosciences*
A. Fronek, M.D., Ph.D., *Professor Emeritus of Surgery and Bioengineering*
A. Hoger, Ph.D., *Associate Professor of Applied Mechanics*
R. L. Lieber, Ph.D., *Professor of Orthopaedics*
K. L. P. Sung, Ph.D., *Associate Professor of Orthopaedics and Bioengineering in Residence*
J. B. West, M.D., Ph.D., *Professor of Medicine and Bioengineering*

Professional Research Staff

J. C. Armour, M.D., Ph.D., *Assistant Research Bioengineer*
D. Baker, Ph.D., *Assistant Project Scientist*
D. Lim, Ph.D., Sc.D., *Project Scientist*
G. Kassab, Ph.D., *Assistant Project Scientist*
J. Price, M.D., Ph.D., *Assistant Project Scientist*
J. Shyy, Ph.D., *Assistant Research Bioengineer*
B. Skierczynski, Ph.D., *Assistant Project Scientist*
A. Tsai, Ph.D., *Assistant Project Scientist*
S. Usami, Ph.D., *Research 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.

At the undergraduate level, the department offers a four-year engineering curriculum leading to a **B.S. in bioengineering**, which prepares students for careers in the biomedical industry or for further education in medical or graduate school. Students completing the B.S. in bioengineering have sufficient preparation in mechanics to permit employment in traditional engineering areas other than the biomedical industry, if they wish. This degree is accredited by the Accreditation Board for Engineering and Technology (ABET/EAC). The department also offers a two-year, upper-division curriculum which, together with required lower-division courses, leads to a **B.A.** or **B.S. degree in applied science in premedical bioengineering**. This applied science curriculum has significantly 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. It is designed to meet most of the requirements of American medical schools and is also suitable for those planning to enter graduate school in bioengineering, physiology, neurosciences, or related fields.

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, the nature of bioengineering design is incorporated at every level in the curricula. This is accomplished by integration of laboratory experimentation, computer applications, and exposure of students 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.** and **Ph.D.** degrees, as well as an integrated **B.S./M.S.** degree. There are also **M.S./M.D.** and **M.D./Ph.D.** degrees offered in conjunction with UCSD Medical School, pending independent admission to the Medical School. 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 Institute for Biomedical Engineering, Institute for Mechanics and Materials, and the School of Medicine.

The Undergraduate Program

Major Requirements

Specific course requirements for each program 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 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 required programs of study must be approved by the Undergraduate Affairs 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 accredited program, TE courses are restricted to those that meet ABET standards. Courses such as Bioengineering 197 and 198 are not allowed as technical electives in meeting the upper-division major requirements. Bioengineering 195 and 199 can be used as technical electives only under restrictive conditions. Policy information may be obtained from the Student Affairs Office.

Students with accelerated academic preparation upon admission to the university may vary the scheduling of lower-division courses such as mathematics, physics, and chemistry, but must first consult the department. Deviations in the scheduling of upper-division bioengineering courses are discouraged, as such changes usually lead to a delay in graduation. Most lower-division courses are offered more than once each year to permit students some flexibility in their program scheduling, but most bioengineering upper-division courses are taught only once each year. The curricula shown in the tables below are consistent with present scheduling.

The difference between the B.A. and B.S. degrees is in the total number of units completed: the B.A. requires a minimum of 180 units, whereas the B.S. requires a minimum of 192 units. The department recommends that all applied science students fulfill the additional unit requirement to receive the B.S. degree, which must be accomplished with at least twelve units of approved technical elective credit.

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 college to which the student belongs, as well as the major requirements determined by the department. The five 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 ABET accredited program, 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 curriculum tables. Accordingly, students in these colleges would take longer to graduate than the indicated four-year schedule. Students must consult with their college to determine which HSS courses to take.

BIOENGINEERING
(ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 10*	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A*	Chem. 6B/6BL	BILD 1
HSS	BE 1	HSS
	HSS	
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C/2CL	AMES 163	BE 100
AMES 121A	AMES 121B	AMES 15
HSS[1]	HSS	HSS
JUNIOR YEAR		
BE 110	BE 112A	BE 112B
AMES 154	BE 186B	BE 172
AMES 103A	AMES 103B	BE 140B
AMES 170	BE 140A	HSS
SENIOR YEAR		
BE 186A	BE 122A	BE 186C
Chem. 131	AMES 158	BE 122B
AMES 105	TE[2]	TE
HSS	HSS	HSS

*Six of the eight courses used to compute the performance index upon which pre-bioengineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and the other must be in engineering science or mathematics.

[1]Ten HSS courses are listed here; individual college requirements may be higher.

[2] Technical electives must be selected from a departmental approved list. Consult the Student Affairs Office.

PREMEDICAL BIOENGINEERING

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A*	Math. 20B*	Math. 21C*
AMES 10*	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A*	Chem. 6B/6BL	Chem. 6C
HSS	BE 1	HSS
SOPHOMORE YEAR		
Math. 21D	Math. 20F	Math. 20E
Phys. 2C/2CL	Chem. 140A	BE 100
BILD 1	BILD 2	Chem. 140B[1]
HSS	HSS	HSS
JUNIOR YEAR		
BE 110	BE 112A	BE 112B
Chem. 143A	AMES 163	AMES 170
HSS	BICD 100	BIBC 100
HSS	HSS	HSS

SENIOR YEAR		
BE 186A	BE 186B	BE 172
BIPN 140	BIPN 100	BIPN 102
TE†	TE	TE
HSS	HSS	HSS

*Six of the eight courses used to compute the performance index upon which pre-bioengineering majors are admitted to the major at the end of the freshman year. Of the other two courses used in this computation, one must be in engineering and one must be in engineering, science, or mathematics.

†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.

[1]Chem 140C is a requirement for application to most medical schools.

Policies and Procedures

Application for Admission to the Major: Because of the strong student interest in the bioengineering programs and the limited resources available to accommodate this demand, maintenance of a quality educational program makes it necessary to limit enrollments to the most qualified students. Admission to the department as a bioengineering major is in accordance with the general requirements established by the School of Engineering described in detail in the section on "Admission to the 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 bioengineering major of their choice. Students not admitted directly to a bioengineering major are identified as pre-bioengineering majors and may be admitted by petition to the department. It is expected that students will have completed or have in progress all eight prerequisite courses when applying. Each petition is evaluated by the departmental Undergraduate Affairs Committee, taking into consideration the student's entire academic record. Pre-bioengineering majors who have achieved a GPA of 3.0 or better in six of the eight required pre-bioengineering courses (Mathematics 20A, 20B, 21C; Physics 2A, 2B; Chemistry 6A) and two other pre-bioengineering courses by the end of the freshman year are assured of admission. Students not admitted to a major by the end of the freshman year must reapply before the end of the sixth quarter of study at UCSD. Pre-bioengineering students denied admission to a bioengineering major will automatically have their major converted from "Pre-bioengineering " to "Undeclared" by the department at the time of their denial. All students, regardless of admission route, are expected to complete lower- and upper-division courses given in the curriculum tables in a timely fashion in the sequences outlined.

Transfer Students: Transfer students may apply for admission to either undergraduate program. Requirements for admission to a bioengineering major and for enrollment in bioengineering courses are the same for transfer students and continuing students (see section on "Admission to the School of Engineering" in this catalog). Students who have taken equivalent courses elsewhere may request to have transfer credit applied toward the department's major requirements. This is done by submitting a petition for transfer credit 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 bioengineering Undergraduate Affairs Committee. Transfer petitions are available from the Student Affairs Office.

Transfer students may apply for admission before the end of the first quarter of study at UCSD and must complete at least two required pre-bioengineering or bioengineering courses, one of which must be an upper-division course. Accordingly, when planning their program, transfer students should be mindful of lower-division prerequisite course requirements upon which admission to the major is based, as well as for meeting college requirements.

Academic Advising: Upon admission to the major, students must make an appointment with an undergraduate adviser in bioengineering 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 of the undergraduate adviser and the Undergraduate Affairs 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.

In order to enroll in any bioengineering courses or courses in another department which are 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 declared pre-engineering students, and/or to students who have been admitted to a bioengineering 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.

Bioengineering 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 a bioengineering 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 bioengineering faculty members. A specific bioengineering faculty adviser is assigned to each student upon admission to the major. Pre-bioengineering majors can obtain programmatic advice from the Student Affairs Office.

Program Alterations and Exceptions to Requirements: Variations from or exceptions to any program or course requirements are possible only if a petition is approved by the bioengineering Undergraduate Affairs Committee before the courses in question are taken. Petition forms may be obtained from the bioengineering Student Affairs Office and must be processed through this office. Bioengineering students may take bioengineering 199, Independent Study for Undergraduates, under the guidance of a bioengineering 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 alter-

native must identify a faculty member with whom they wish to work and propose a two-quarter research or study topic. 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 form to the 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 bioengineering 195, Undergraduate Teaching. Normally, this course is taken 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 premedical bioengineering 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 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 receipt 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. The Department of Bioengineering does not have financial assistance available for students enrolled in this program.

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.

The Graduate Program

Admission to the M.S. and Ph.D. 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, physical sciences, mathematics, or quantitative life sciences. Applicants must have a GPA of 3.4 or better in technical courses and 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. 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 for the M.S. *only* is designated when the applicant's prior academic qualifications are judged to be marginal; admission for 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. These admission designations are important for master's students who subsequently wish to continue in the Ph.D. program. Policy in this regard is given under the "Master's Degree Program" below.

Both M. S. and Ph. D. bioengineering students are required to take the bioengineering core graduate courses—Bioengineering 231A, B, C and Bioengineering 252A, B, C—and pass with a grade of B or better. A new graduate student who does not meet the prerequisites of these core courses 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, AMES 103B, Bioengineering 110, 122A, B in the first year and Bioengineering 252A, B, C in the second year. A student deficient in biology and chemistry may have to take Chemistry 131 and BIPN 100, 102 in the first year and Bioengineering 231A, B, C in the second year.

Students are welcome to seek enrollment in bioengineering courses via UC Extension's concurrent registration program, but such enrollment in a bioengineering graduate course must be approved by the instructor.

Master's Degree Programs

The M.S. program is intended to extend and broaden the undergraduate training and/or to equip practicing bioengineers with fundamental knowledge in their particular field. 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.

Course requirements: Certain core course work requirements are common to both plans. These are as follows.

1. Course work must include Bioengineering 231A, B, C and Bioengineering 252 A, B, C.
2. Units obtained in Bioengineering 281, 299, or 501 may not be applied toward the course work requirement.
3. No more than a total of eight units of Bioengineering 296 and 298 may be applied toward the course work requirement.
4. 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 re-

quirements. Additional requirements of each plan are as follows.

Thesis Plan I: 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 (nine courses) in course work and twelve units of Bioengineering 299 to fulfill the research requirement. 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.

Comprehensive Examination Plan II: This plan involves course work only and culminates in a comprehensive examination. A total of forty-eight units of credit (or twelve courses) is required. The student's program is arranged according to the requirements above, with prior approval of the faculty adviser. The comprehensive examination is conducted by the adviser and at least two other faculty members appointed by the dean of Graduate Studies. The examination committee conducts an oral examination in the areas of specialization covered by course work taken by the student, two of which must be physiology and biomechanics. 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. The Student Affairs Office should be contacted for further details.

Change of Degree Aim. 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 the Committee on Graduate Affairs. The committee will appoint three bioengineering faculty to examine the applicant in one mutually agreed-upon and well-defined topic. The results of this examination, together with any other relevant information, e.g., the student's graduate record, will form the basis for a recommendation. If the recommendation is positive and the request approved, the student must submit a petition to effect the change of status. In addition, the examining committee may recommend that the examination satisfy one of the four topics required in the departmental qualifying examination for the doctorate.

M.S. candidates who wish to pursue a doctorate must submit an application for a change in status to the Committee on Graduate Affairs. The application must be approved and signed by a bioengineering faculty member who expects to serve as the student's Ph.D. adviser. If the application is then approved by the Committee, the student must submit a petition to effect the change of status. If the student elects the comprehensive examination plan for the M.S. degree, this examination may be used to both fulfill the requirement for the M.S. degree and satisfy one of the four topics required in the departmental qualifying examination for the doctorate.

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.

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 necessary.

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 core 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 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 strong command of the scientific fundamentals in a sufficiently broad range of topcis that form the foundations of bioengineering research 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., AMES, ECE, Medicine). The student is responsible for four subject areas, each of which is defined by the material covered respectively in a cohesive series of three graduate courses. The oral examination is based on three of the areas, whereas the fourth area may be satisfied by course work. In order to insure adequate breadth, a maximum of two areas can be closely related to the student's research interests. The examination areas, courses comprising each area, and composition of the examination committee must be approved by the departmental Committee on Graduate Affairs. 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. The teaching experience is defined as service as a graduate student instructor for one quarter in a course designated by the department. The teaching experience can be fulfilled as a requirement for student support or 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 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 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

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).

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)

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: grade of C– or better in Math. 21C and Phys. 2C .* (S)

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: admission to the major and grades of C– or better in Phys. 2A-C.* (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. Bioviscoelastic fluids and solids. Non-Newtonian behavior of blood, synovial fluid, mucus, and protoplasm. Design of surgical procedures and prosthetic devices. *Prerequisite: grade of C– or better in BE 110.* (W)

112B. Biomechanics (4)
Basic mechanical properties of collagen and elastin, bone, cartilage, muscles, blood vessels, and other living tissues. Application of continuum mechanics to hard and soft tissues. Biomechanical engineering design for clinical applications. *Prerequisite: grade of C– or better in BE 112A.* (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 control of first and second order processes. PID controllers. Stability. Bode design. Features of biological control systems. A simulation term project using MATLAB and an oral presentation are required. *Prerequisite: grade of C– or better in AMES 163.* (W)

122B. Biomedical Electronics (4)
Measurement circuits and signal analysis in biological systems and medicine. Passive and active circuits. Semiconductors. Operational amplifiers. Nonlinear devices. Signals in continuous and discrete time systems. Modulation. Digital signal processing. Sampling. Noise. Digital filters. Computer design and use for biomedical instrumentation. A term project and oral presentation are required. *Prerequisites: grade of C– or better in BE 122A. Majors only.* (S)

140A. Introduction to Bioengineering Physiology (4)
Introductory mammalian physiology for bioengineering students, with an emphasis on control mechanisms and engineering principles. Nervous and cardiovascular systems. Not intended for premedical bioengineering students. *Prerequisites: grade of C– or better in Chem. 6B, Phys. 2C and BILD 1* (W).

140B. Introduction to Bioengineering Physiology (4)
Introductory mammalian physiology for bioengineering students, with an emphasis on control mechanisms and engineering principles. Renal and endocrine systems, considering regulation from molecular-cellular to organ systems level. *Prerequisite: grade of C– or better in BE 140A.* (S).

160A. Metabolic Engineering (4)
Engineering systems analysis of metabolic processes common to all living organisms. Kinetics of individual enzymatic reactions. Computer simulations of metabolic networks. The stoichiometric matrix, systemic sensitivity coefficients, bifurcations and redirection of metabolic fluxes. Temporal decompositions of metabolic processes into multiple time scales and the physiologic roles of metabolic events in each scale. *Prerequisites: grade of C– or better in BE 122A and admission to the major.* (F)

160B. Biochemical Engineering (4)
Industrial microbial production strains, bioreactor and fermenter designs, bioprocess monitoring and control. *Prerequisites: BE 160A and admission to the major.* (W)

160C. Biochemical Engineering (4)
Bioseparations. Commercial production of biochemical commodity products. *Prerequisites: BE 160B and admission to the major.* (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: grade of C– or better in AMES 170, BE 160B.* (W)

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, extracellular matrix, and growth factor communication. The design of functional

tissue units. Clinical Applications. *Prerequisites: BE 160B and admission to the major.* (W)

172. Bioengineering Laboratory (4)
A laboratory course which demonstrates basic concepts of bioengineering design through experimental procedures involving humans and experimental 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 AMES 170 and senior standing in the major.* (S)

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. Ethical issues. A term project and oral presentation are required. *Prerequisite: grade of C– or better in BE 112B.* (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. Mechanical transducers for displacement, force and pressure. Temperature sensors. Flow sensors. Light-based instrumentation. Electrical safety. A term project and oral presentation are required. *Prerequisite: grade of C– or better in AMES 163 and 170.* (W)

186C. Bioengineering Design (4)
Preparation of formal engineering reports on a series of engineering analysis and design problems illustrating methodology from various branches of applied mechanics as applied to bioengineering problems. Statistical analysis. Governmental regulations. Bioethical issues. A term project and oral presentation are required. *Prerequisites: grades of C– or better in AMES 103A-B, 121A-B, 154, BE 112B, 122B, and 186B. Majors only.* (S)

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)

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.) *Prerequisite: consent of instructor.* (F,W,S)

199. Independent Study for Undergraduates (4)
Independent reading or research by arrangement with a bioengineering faculty member. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

GRADUATE

207. Topics in Bioengineering (4)
Course given at the discretion of the faculty on current topics of interest in bioengineering. *Prerequisite: consent of instructor.*

231A. Cell and Molecular Biology (4)
A general survey of structure-function relationships at the cell and tissue level. Emphasis on components of the vascular system and related structures such as endothelium, erythrocytes, leucocytes, cardiac, smooth and skeletal muscle, connective tissue, basement membranes, and peripheral nerve cells. *Prerequisites: BIPN 100 and 102, or consent of instructor.* (F)

231B. 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 BE 231A, or consent of instructor.* (W)

231C. 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 BE 231B, or consent of instructor.* (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: BE 231A or consent of instructor.* (F)

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: BE 241A.* (W)

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: BE 241B* (S)

252A. Biomechanics (4)
An introduction to biomechanics and transport phenomena in biological systems at the graduate level. Biorheology, bioviscoelastic fluids and solids, muscle mechanics, mass transfer, momentum transfer, energy transfer. *Prerequisites: AMES 103B, BE 110, and BE 112B, or consent of instructor.* (F)

252B. Biomedical Transport Phenomena (4)
Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. *Prerequisite: BE 252A , or consent of instructor.* W)

252C. 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: BE 252B or consent of instructor.* (S)

255. Biodynamics: Flow, Motion, and Stress (4)
Stress distribution in organs. Body dynamics. Fluid movement. Flying and swimming. Growth and change. Strength and tolerance. Trauma and design for safety. *Prerequisite: BE 252A or consent of instructor.*

264. Advanced Biomedical Transport Phenomena (4)
Applications of heat, mass, and momentum transfer in biomedical systems. Extension of the principles encountered in BE 252B-C to practical biomedical systems. *Prerequisites: BE 252B-C or consent of instructor.*

265. Biomechanics of Cells (4)
A survey of mechanical properties of cells and intracellular components. Elastic, viscous, and viscoelastic behavior of cell membranes, cytoplasm, pseudopods, and erythrocytes, leukocytes, endothelial cells, muscle. Experimental techniques and theoretical analysis. Applications to individual cell testing, filtration tests, and cell division. *Prerequisites: BE 231A and 252A or consent of instructor.*

266. Methodology for Single Cell Studies (4)
Technology for the characterization and measurement of biophysical properties of single live cells. Imaging techniques. Membrane mechanics. Mechanical and fluid mechanical manipulation. Electrodes and electrical methods. Flow and image cytometry. Automated cell recognition and sorting. *Prerequisite: consent of instructor.*

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.*

268. Blood Substitutes (4)
Principles of oxygen transport to tissue and transfusion physiology. Development and clinical use of artificial oxygen carriers, i.e., blood substitutes. Physiology of tissue oxygenation. Current developments. Experimental models for the study of oxygen transfer and measurement techniques. Medical applications. *Prerequisite: consent of instructor.*

269. Selected Topics in Biophysics (4)
Selected topics on the structure and function of biological membrane, fluid and ion transport, excited states, wave propagation, muscle contraction, chemotaxis, chemical sensors, enzyme probes, swimming, and flying. *Prerequisite: BE 252C or consent of instructor.*

275. Computational Biomechanics (4)
Numerical solution of ordinary differential equations governing biological systems. Finite element methods for anatomical modeling and boundary value problems in biomechanics of tissues and medical devices. Finite difference methods for partial differential equations. Nonlinear biodynamics, heat flow, cardiac impulse propagation, anatomic modeling and biomechanics. *Prerequisite: consent of instructor.*

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)

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 grades permitted.)

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.*

Computer Science and Engineering (CSE)

OFFICES:
Undergraduate Affairs 4016
Graduate Affairs 4018
Applied Physics and Mathematics Building,
Muir College

Professors

Donald W. Anderson, Ph.D.
Francine D. Berman, Ph.D.
Kenneth L. Bowles, Ph.D., *Professor Emeritus*
Walter A. Burkhard, Ph.D.
Larry Carter, Ph.D.
Flaviu Cristian, Ph.D.
Jeanne Ferrante, Ph.D.
Joseph A. Goguen, Ph.D.
William E. Howden, Ph.D.
T. C. Hu, Ph.D.
Ramesh C. Jain, Ph.D.
Christos Papadimitriou, Ph.D., *Jacobs Professor of Computer and Information Science*
Walter J. Savitch, Ph.D.
Victor D. Vianu, Ph.D.
S. Gill Williamson, Ph.D.

Associate Professors

Richard K. Belew, Ph.D.
Chung-Kuan Cheng, Ph.D.
Garrison W. Cottrell, Ph.D.
Keith Marzullo, Ph.D.
Alex Orailoglu, Ph.D.
Joseph C. Pasquale, Ph.D.
Ramamohan Paturi, Ph.D.
George Polyzos, Ph.D.
P. Venkat Rangan, Ph.D.

Assistant Professors

Scott B. Baden, Ph.D.
Mihir Bellare, Ph.D.
Charles P. Elkan, Ph.D.
William G. Griswold, Ph.D.
Russell Impagliazzo, Ph.D.
Bennet S. Yee, Ph.D.

Adjunct Faculty

Michael J. Bailey, Ph.D.
Samuel R. Buss, Ph.D.
Sidney Karin, Ph.D.
Walter H. Ku, Ph.D.
Jeffrey B. Remmel, Ph.D.
J. B. Rosen, Ph.D.
Terrence J. Sejnowski, Ph.D.

Research Faculty

Eric Mjolsness, Ph.D., *Research Scientist*

The Undergraduate Programs

The department offers computer science and computer engineering curricula leading to the bachelor of science (B.S.) degree as well as the bachelor of arts (B.A.) degree in computer science. 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 16 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 programming, although helpful, are not required for admission to the program.

The department requires a total of 144 units for the B.S. computer science program. There are three varieties of requirements: lower-division, upper-division and technical electives.

1. LOWER-DIVISION REQUIREMENTS

Students are expected to complete the following 68 units by the end of their sophomore year.

Computer Science and Engineering: CSE 10 (or 9B) or 11, 12, 20, 21 and 30; 20 units.

Mathematics: Math. 20A, 20B, either 21C(2C), and 21D(20D) or 20C and 20D, and 20F; 20 units.

Physics: Phys. 2A, 2B, 2C; 12 units. Math. 2A is a prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B 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, 4B, 4C for Phys. 2A, 2B, 2C.

Physics Lab: Phys. 2BL or 2CL or 2DL; 2 units. The lab courses should be taken concurrently with the Phys. 2 or Phys. 4 sequence.

Introduction to Electrical Engineering: ECE 53 and ECE 54; 6 units. ECE 53 is a new course that gives a comprehensive introduction to electrical engineering. ECE 54 is a two-unit lab course that should be taken concurrently with ECE 53.

Probability and Statistics: Math.183; 4 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, Bio. 1, 10, 12, 14, 30.

2. UPPER-DIVISION REQUIREMENTS

All B.S. computer science students are required to take CSE 100, 101, 105, 120, 130, 131A, 131B, 140, 140L, 141 and 141L.

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 and/or CSE 140 and 140L in the sophomore year.

3. TECHNICAL ELECTIVES

B.S. computer science students are required to take nine technical electives for a total of 36 units. Students must take a least one of the following systems course: CSE 121, 123A, 126, 132. Of the remaining eight electives, at least

five must be computer science and engineering upper-division or graduate courses.

The remaining three 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**.

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 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 144 units. There are three varieties of requirements; lower-division, upper-division and technical electives.

1. LOWER-DIVISION REQUIREMENTS

Students are expected to complete the following 68 units by the end of their sophomore year.

Computer Science and Engineering: CSE 10 or 9B or 11, 12, 20, 21 and CSE 30/ECE 30; 20 units.

Mathematics: Math. 20A, 20B, either 21C(2C), and 21D(20D) or 20C and 20D, and 20F; 20 units.

Physics: Phys. 2A, 2B, 2C, 2D; 16 units. Math. 2A is a prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B 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, 4B, 4C, 4D for Phys. 2A, 2B, 2C, 2D.

Physics Lab: Phys. 2BL or 2CL or 2DL; 2 units. The lab courses should be taken concurrently with the Phys. 2 or Phys. 4 sequence.

Introduction to Electrical Engineering: ECE 53 and ECE 54; 6 units. ECE 53 is a new course that gives a comprehensive introduction to electrical engineering. ECE 54 is a two-unit lab course that should be taken concurrently with ECE 53.

Probability and Statistics: ECE 151; 4 units.

2. UPPER-DIVISION REQUIREMENTS

All B.S. computer engineering students are required to take CSE 100, 101, 105, 120, 131A, 131B, 140, 140L, 141, and 141L.

In addition, all B.S. computer engineering students have to fulfill the following upper-division ECE requirements.

Linear Systems: ECE 101, ECE 171A; 8 units.

Electronic Circuits and Systems: ECE 102, ECE 108; 8 units.

If students want to accelerate their program, they should consider taking CSE 100 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 24 units. One of these courses must be either CSE 145, ECE 117, or ECE 119. Of the remaining five course, 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**.

B.A. Computer Science Program

The B.A. computer science program gives the students more latitude in designing their course of study. The lower-division program is designed to provide 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, B.A. computer science program serves those students desiring more time for undergraduate studies outside their major subject.

The department requires a total of 104 units for the B.A. computer science program. There are three varieties of requirements: lower-division, upper-division and technical electives.

1. LOWER-DIVISION REQUIREMENTS

Students are expected to complete the following 52 units by the end of their sophomore year.

Computer Science and Engineering: CSE 10 (or 9B) or 11, 12, 20, 21 and 30; 20 units.

Mathematics: Math. 20A, 20B, either 21C(2C), and 21D(20D) or 20C and 20D, and 20F; 20 units.

Physics: Phys. 2A, 2B, 2C; 12 units. Math. 2A is a prerequisite for Phys. 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math. 2B 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, 4B, 4C for Phys. 2A, 2B, 2C.

2. UPPER-DIVISION REQUIREMENTS

All B.A. computer science students are required to take CSE 100, 101, 105, 120, 131A, 131B, 140, 140L, 141 and 141L.

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 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 16 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**.

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 should 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. 166A-B, 168A-B, 176A-B, 179A-B, 184A-B, 186A-B, 188, 189A-B-C, 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, ECE 104, Math. 174, Math. 173, Phys. 105, AMES 153, AMES 154. No credit for any of these courses will be given if Math. 170A-B-C is taken.

Electrical and Computer Engineering: All ECE upper-division courses except 195-199.

CSE 143 is equivalent to ECE 165. Students may not get credit for both CSE 123A and ECE 158A or for both ECE 151 and ECE 109.

Cognitive Science: Fundamental Cognitive Phenomena 101A-B-C, Cognitive Neuroscience 107A-B-C, Modeling Cognitive Phenomena 108A, 108AL, 108P, Everyday Cognition 130, Distributed Cognition 131, Cognitive Engineering 132, Observation, Protocol, and Discourse Analysis 141, Semantics 150, Language Comprehension 153, Natural and Artificial Symbolic Representational Systems 170, Advanced Parallel Distributed Processing 181, Advanced Artificial Intelligence Modeling 182.

Students may not get credit for both CSE 150 and Cog. Sci. 108M or for both CSE 151 and Cog. Sci. 108A/182.

Applied Mechanics and Engineering: All upper-division AMES courses except AMES 163A-B and AMES 195-199.

Students may receive elective credit for only one of the following courses: CSE 164A, ECE 104, Math. 174, Math. 173, Phys. 105, AMES 153, AMES 154. Students may only get credit for one of the two courses, CSE 167 or AMES 157.

Economics: Microeconomics 100A-B, Game Theory 109, Macroeconomic 110A-B, Mathematical Economics 113, Econometrics 120A-B-C, Applied Econometrics 121, QEDS Microeconomics 170A-B, Decision Under Uncertainty 171, Introduction to Operations Research 172A-B-C, Economic Forecasting 178.

Linguistics: Phonetics 110, Phonology 111, 115, Grammatical Structure 120, Syntax 121, 125, Semantics 130, Formal Linguistics 160, Computational Linguistics 163, Psycholinguistics 170, Language and the Brain 172, and Sociolinguistics 175.

Five Year Bachelor's–Master's Program

Students enrolled in the departmental programs, who maintain a distinguished scholastic record through their junior year, are encouraged to apply for the five-year B.S.-B.A./M.S. program. Applications for admission to the graduate program may be made in the spring quarter of the junior year. In their senior year such students may enroll in graduate courses and can complete the requirements for the master's degree within one year after receiving the bachelor's degree. Admission for graduate study through the B.S. /M.S. program will be for the M.S. degree only. Students wishing to continue toward the Ph.D. degree must apply and be evaluated according to the usual procedures and criteria for admission to the Ph.D. program. The student's choice of electives must be discussed with his or her adviser.

Minors and Programs of Concentration

The Minor in Computer Science is designed to provide basic proficiency in computer science. The lower-division requirements focus on programming methodology and skills, computer organization, and relevant mathematical skills. The upper-division courses will give an in-depth view of an area of interest chosen by the student.

The Minor requires successful completion of a total of eight CSE courses. To be admitted into the minor, students must have an average 2.0 GPA and a C- or better in CSE 10 (or 9B), 12, 20, 21, 30. The remaining three CSE courses can be selected from the following upper-division sequences. If a student wishes other CSE courses than the ones listed, CSE adviser approval is required. In order for the minor to be awarded students must receive an average 2.0 GPA in the upper-division courses.

Students should consult their college provost's office concerning the rules for the minor or program of concentrations.

Artificial Intelligence:
CSE 100
CSE 150
and:
CSE 151

Computer Software:
CSE 100
CSE 131A
and:
CSE 131B or CSE 120 or CSE 130

Computer Hardware:
CSE 140
CSE 140L
CSE 141
and:
CSE 141L

Computer Theory:
CSE 100
CSE 101
and:
CSE 105

Computer Systems:
CSE 120
CSE 121
and:
CSE 122 or CSE 123A
Computer Networks:
CSE 120
CSE 123A
and:
CSE 123B
Scientific Computation:
CSE 160
CSE 164A
and:
CSE 164B
Storage Systems:
CSE 100
CSE 102
and:
CSE 120

Computing Courses for Non-majors

Computer science and engineering lower-division courses are available to all students. Also, the department offers three slower-paced courses providing a practical introduction to computers, computation, and programming: CSE 1 an introduction to computers and CSE 5A-B an introduction to structured programming using the C programming language.

Policies and Procedures for CSE Undergraduates

ADMISSION TO MAJORS

Freshman students who have excelled in high school will be directly admitted by the Dean of the School of Engineering into their major. These students will be notified directly of their status.

Otherwise, admission to computer science and engineering majors is based on performance in the following required lower-division courses: Math. 20A, 20B, 20C/21C, Phys. 2A, 2B, and CSE 10 (or 9B) or 11, 12, 20, 30. (For more details, see the section "Admission to majors in the School of Engineering" in this catalog.) Currently students who have a GPA of 2.8 or better in the screening courses will be guaranteed admission into the major of their choice.

Students classified as "Pre-CSE" majors are encouraged to apply to the computer science and engineering major after a minimum of three quarters of study here but no later than six quarters (or three quarters for transfers.) Applications may be obtained from the Undergraduate Affairs Office in Room 4016 Applied Physics and Mathematics Building.

"Pre-CSE" students denied admission to a computer science and engineering major will automatically have their major converted from "Pre-CSE" to "Undeclared" by the department at the time of their denial. "Pre-CSE" students will not be allowed to continue to enroll in upper-division computer science and engineering courses beyond the fall quarter of their junior year.

However, computer science and engineering minors and students in related majors who are required to take computer science and engineering courses will be allowed to enroll in upper-division courses as long as they have completed the required prerequisites or equivalents.

TRANSFER STUDENTS

Transfer students entering the university with 36.0 or more quarter units must apply for admission to the major no later than their third quarter of study here. Requirements for admission to upper-division courses and to the major curricula are the same for transfer students as for continuing students. When planning their program, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses. Transfer students should be prepared either to petition equivalent courses with the appropriate departments and/or present a copy of their records prior to making application to a computer science and engineering major.

Students who wish to enter a major curriculum directly must make application to the department before the beginning of the fall quarter, submitting course descriptions and transcripts for courses used to satisfy their lower-division requirements. Although admission is not normally restricted to the fall quarter, transfer 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.

ENROLLING IN UPPER-DIVISION COURSES

The Department of Computer Science and Engineering will attempt to provide sufficient sections of all lower-division courses so that students who meet the prerequisites for a given course will be able to enroll. Students will, however, be screened to ensure that they meet all course prerequisites for these lower-division courses.

Admission to upper-division courses will be restricted to students having completed all prerequisites with a C- or better (or consent of the instructor.) The majority of these 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 the prerequisites and/or performance standards have not been met. Admission to all computer science and engineering courses will require obtaining either authorization through telephone registration or department stamps on an add/drop card, and it will be given only by the student affairs personnel.

GRADUATION REQUIREMENTS

All upper-division 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.

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 maintain a distinguished scholastic record through their junior year, are eligible to apply for the Five Year Bachelor's–Master's Degree Program. Students are encouraged to apply before the last quarter of their junior year of study. 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 in any 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.S. and M.S. degree within a five-year time period. Courses taken can be used toward either the 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.

Advanced Manufacturing

A master of science degree in this department with a specialization in advanced manufacturing exists. For more information on this option please see page 00 in the *UCSD General Catalog*.

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 15. Admissions are always effective the following fall quarter.

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 degere: 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 Examaination, No Thesis

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. 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. 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

Starting in fall 1996, students entering the M.S. Program in Computer Science will choose an area of concentration from among nine areas. Each concentration is an area in which the faculty has significant research expertise.

The typical concentration is a collection of four 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 240. Principles of Computer Architecture
CSE 292. Faculty Research Seminar

The department expects to offer concentrations in the following areas:

Artificial Intelligence
Communication Networks
Database and Information Retrieval
Design Automation for Microelectronic Designs
Distributed Computing
Multimedia Systems
Parallel and Scientific Computing
Software Engineering
Storage Systems

The specific courses involved in each of the concentrations are detailed in a separate bulle-

tin which is available in the Graduate Student Affairs Office, 4018 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, 501, and any of the seminar courses CSE 209, 229, 269, and 290 do not count toward the elective requirement.

Doctoral Program

The general requirements for the Ph.D. program are stated in the "Graduate Studies" section of the catalog. A brief summary of the general requirements is also provided in the section titled "All Doctoral Programs." Consistent with these requirements, the department has established a set of requirements to be fulfilled in the first two to three years of the Ph.D. program as described below.

COURSE REQUIREMENTS

Ph.D. students are expected to complete the course requirements in the first two years of the program. They are expected to maintain, on an annual basis, a 3.4 grade-point average for the core courses.

Ph.D. students entering with a master's degree may petition for a waiver of the core courses or for substitution by alternative courses.

CORE COURSES

Each Ph.D. student must take all of the following courses. A student typically completes all the core courses within the first year of the graduate study.

CSE 200
CSE 202
CSE 221
CSE 230
CSE 240
CSE 292

ELECTIVES

Each Ph.D. student must take four technical electives consisting of other CSE graduate courses or approved alternatives.

COMPREHENSIVE EXAMINATION REQUIREMENT

The comprehensive examination for Ph.D. students consists of two parts. The first part is a written examination, identical to that required for master's degree students. This examination tests the student's knowledge of basic computer science and can be passed with a thorough knowledge of undergraduate and first-year graduate computer science material. The written examination is structured around the following five CSE core areas: algorithms and data structures; computability, complexity and logic; programming languages; operating systems; and computer architecture and digital logic design. 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. All Ph.D. students should complete their written comprehensive examination successfully within two years following the quarter in which they are admitted to the Ph.D. program. However, a student typically completes the written part of the comprehensive examination successfully by the fall quarter of the second year. More information regarding the comprehensive examination can be found in a separate document provided by the CSE graduate office.

RESEARCH EXAMINATION REQUIREMENT

The second part of the comprehensive examination for Ph.D. students is an oral research examination designed to get an early assessment of the Ph.D. student's research ability in some field in computer science. The content of this exam is developed by the student in collaboration with a faculty adviser in CSE. Students are expected to take this examination within one year following the quarter in which they pass the written comprehensive examination.

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 240
ECE 260A
CSE 243 or ECE 251A or ECE 263A

Two Analysis Courses:
CSE 200 or CSE 201
CSE 222 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 240
ECE 260A
CSE 243 or ECE 251A or ECE 263A

Two Analysis Courses:
CSE 200 or CSE 201
CSE 222 or CSE 257A

and
CSE 292

Electives

Students must elect at least twelve technical units among graduate courses within the Departments of AMES, 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 Program

The general requirements for the Ph.D. program are stated in the "Graduate Studies" section of the catalog. A brief summary of the general requirements is also provided in the section titled "All Doctoral Programs." Consistent with these requirements, the department has established a set of requirements to be fulfilled in the first two to three years of the Ph.D. program as described below.

COURSE REQUIREMENTS

Ph.D. students are expected to complete the following computer engineering curriculum of forty-nine unit course requirement within the first two years. Ph.D. students entering with a master of science degree may petition to waive individual core course requirements or to substitute approved alternative courses. All Ph.D. students must attain a cumulative grade-point average of 3.4 in the core courses.

CORE COURSES

Each Ph.D. student must complete the following core requirements:

Three Software Courses:
CSE 202
CSE 221
CSE 231

Three Hardware Courses:
CSE 240
ECE 260A
CSE 243 or ECE 251A or ECE 263A

Two Analysis Courses:
CSE 200 or CSE 201
CSE 222 or ECE 257A

and
CSE 292

ELECTIVES

Students must elect at least sixteen technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics.

COMPREHENSIVE EXAMINATION REQUIREMENT

The comprehensive examination for Ph.D. students consists of two parts. The first part is a written examination, identical to that required for master's degree students. This examination tests the student's knowledge of basic computer science and engineering and can be passed with a thorough knowledge of undergraduate and first-year graduate computer science and engineering material. The written examination is structured around the following five CSE core areas: algorithms and data structures; computability, complexity and logic; programming languages; operating systems; and computer architecture and digital logic design. This examination is the same for both the computer science and the computer engineering graduate 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. All Ph.D. students should complete their written comprehensive examination successfully within two years following the quarter in which they are admitted to the Ph.D. program. However, a student typically completes the written part of the comprehensive examination successfully by the fall quarter of the second year.

More information regarding the comprehensive examination can be found in a separate document provided by the CSE Graduate Office.

RESEARCH EXAMINATION REQUIREMENT

The second part of the comprehensive examination for Ph.D. students is an oral research examination designed to get an early assessment of the Ph.D. student's research ability in some field in computer science. The content of this exam is developed by the student in collaboration with a faculty adviser in CSE or ECE. Students are expected to take this examination within one year following the quarter in which they pass the written comprehensive examination.

All Doctoral Programs

Qualifying Examination and Advancement to Candidacy

The qualifying examination is the second examination (the first being the written and the oral comprehensive examination) taken by the Ph.D. students and is a requirement to advancement to candidacy. Prior to taking the qualifying examination a student must have satisfied the departmental graduate requirements and have been accepted by a CSE faculty member as a Ph.D. thesis candidate. All doctoral students must be advanced to candidacy by the end of four years from the first quarter of registration. It 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 initial progress has been made. The candidate is expected to describe his or her accomplishments to date and plans for 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.

COURSES

For the names of the instructors who will teach the courses in a particular term, please refer to the quarterly *Schedule of Classes.* A tentative schedule of course offerings is available from CSE undergraduate office each spring for the following academic year.

Please note: Effective fall 1994, the Department of Mathematics replaced the Math. 2 sequence with a new Math. 20 sequence. The Mathematics prerequisites for the following courses will change accordingly. Please refer to the Department of Mathematics' catalog copy for a full description of the transition.

LOWER-DIVISION

CSE 1. Introduction to Computers (4)
(Formerly CSE 60) The main technical topic is the use of Macintosh and UNIX computers. Lectures cover the history of computing, how computers are used in society today, an introduction to software development using Hypercard, worldwide information access through the Internet, and a few topics in computer science. *Prerequisite: none. This course is not suitable for engineering majors.*

CSE 2. Computers & Society (4)
(Formerly CSE 69) This course will be of interest to three kinds of people: Those who will be involved in the design and implementation of computer technology; those who will use computer technology; and those who will in one way or another be affected by computer technology. In short, everybody. *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 an equivalent course.) *Prerequisite: A familiarity with high-school level algebra is expected, but this course assumes no prior programming knowledge.*

CSE 5B. Introduction to Programming II (4)
(Formerly CSE 62B) Introduction to algorithms and top-down problem solving. Completion of the C programming language including structures, pointers, multi-dimensional array, C-preprocessor, and standard libraries. Simple data structure techniques. Continuation within the pc operating system environment; graphical user interface. (A student may not receive credit for CSE 5B after receiving credit for CSE 10 or an equivalent course.) *Prerequisites: Math. 1A/2A /20A and CSE 5A or CSE 62A.*

CSE 9A. Introduction to Computer Science with C++ (4)
Introduction to programming using C++; basic UNIX commands; introduction to the C++ language including classes; modularity and top-down design; abstract data types; documentation; testing. CSE 9A-B is a slower paced version of CSE 10 with more programming practice. (Students who have taken CSE 10 or CSE 11 may not take CSE 9A.) *Prerequisite: high school algebra.*

CSE 9B. Introduction to Computer Science with C++ (4)
Introduction to programming using C++; the C++ language including arrays and classes; abstract data types; documentation; testing and verification. CSE 9A-B is a slower paced version of CSE 10 with more programming practice. (Students may receive credit for only one of CSE 9B, CSE 10, CSE 11.) *Prerequisite: high school algebra.*

CSE 10. Introduction to Computer Science with C++ (Accelerated Pace) (4)
Introduction to programming; basic UNIX commands; the C++ language including arrays and classes; modularity and top-down design; abstract data types; documentation; testing and verification. A faster paced version of CSE 9A-B for students with some previous programming experience. (Students may receive credit for only one of CSE 9B, CSE10, CSE 11.) *Prerequisite: high school algebra; previous programming experience recommended.*

CSE 11. Introduction to Computer Science (LISP version) (4)
Introduction to computer science and programming using a dialect of the LISP language; basic UNIX commands; a LISP type language; modularity and top-down design; abstract data types; documentation techniques; testing and verification techniques; concludes with a brief introduction to the C++ language. (Student may receive credit for only one of CSE10, 11, CSE 65 or 62B.) *Prerequisite: high school algebra.*

CSE 12. Basic Data Structures and Object-oriented Programming (4)
Basic data structures including: static and dynamic implementation of trees, and balanced tree techniques. Basic object-oriented programming including: classes and abstract data types, inheritance, overloading and virtual methods, constructors and destructors. Uses the C++ programming language. *Prerequisite: CSE 10 or CSE 11.*

CSE 20. Discrete Mathematics (4)
(Formerly CSE 160A) Propositional and predicate logic; methods of proof; mathematical induction; number systems; discrete structure such as sets, functions, relations, strings, partial orders and equivalence relations; pigeonhole principle; infinite sets; diagonalization; uncomputability. These topics will be illustrated with applications to digital logic design, elementary number theory, program correctness, and others. *Prerequisite: CSE 10 or CSE 11.*

CSE 21. Mathematics for Algorithm and Systems Analysis (4)
(Formerly CSE 160B) 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. *Prerequisite: CSE 20 or CSE 12 is strongly recommended.*

CSE 30. Computer Organization and Systems Programming (4)
(Formerly CSE 70) Introduction to computer organization of modern digital computers - understanding the various components of a computer and their inter-relationships. 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 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 10 or CSE 11.*

CSE 81. The Internet and the World Wide Web (2)
Introduction to computer networks from a user's perspective and the World Wide Web, a set of interconnected multimedia information servers. The course will provide hands-on experience with electronic mail, file transfer, and web browsers, including building hypertext markup language (HTML) documents. (P/NP grades only.) *Prerequisite: CSE 1 or CSE 5A, CSE 9A-B, CSE 10, CSE 11.*

UPPER-DIVISION

CSE 100. Data Structures (4)
(Formerly CSE 161A) Descriptive and analytic introduction to data structures and algorithms. Lists, tables, priority queues, disjoint subsets, dictionaries data types. Data structuring techniques including linked lists, arrays, hashing, trees. Run time performance using Big-O notations; worst case and amortized analysis. *Prerequisites: CSE 12, CSE 20, and CSE 30, or consent of the instructor.*

CSE 101. Design and Analysis of Algorithms (4)
(Formerly CSE 179) 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. *Prerequisites: CSE 12, CSE 21, and CSE 100.*

CSE 102. File and Storage Structures (4)
(Formerly CSE 161B) Descriptive and analytic introduction to file structures and storage media. Sequential files, external sorting; index structures, B^+-trees, linear hashing, Patricia, grid; random and sequential access storage devices, WORM, data compression. *Prerequisite: CSE 100 or consent of the instructor.*

CSE 105. Introduction to the Theory of Computation (4)
(Formerly CSE 165) 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, pushdown automata, parsing theory, closure properties, and noncontext-free languages; computable languages: turing machines, recursive functions, Church's thesis, undecidability, and the halting problem. *Prerequisites: CSE 10 or CSE 11, and CSE 20, or consent of the instructor.*

CSE 110. Software Engineering (4)
(Formerly CSE 180) Different aspects of software engineering will be studies. Topics include design methods, requirements and specification, validation and program testing, maintenance, and programming methodology. *Prerequisites: CSE 100 and either CSE 130 or CSE 131A.*

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 interpreters, and processor scheduling. *Prerequisites: CSE 100 and CSE 141, or consent of the instructor.*

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 122. Operating Systems Laboratory (4)
(Formerly CSE 171C) Laboratory for experimenting with a selected operating system. Modification of major mechanisms and scheduling policies. Topics include context-switching, memory management algorithms, CPU scheduling algorithms, interprocess communication mechanisms, performance analysis, device driver design. *Prerequisite: CSE 121.*

CSE 123A. Computer Networks (4)
(Formerly CSE 166) Introduction to concepts, principles, and practice of computer communication networks with examples from existing architectures, protocols, and standards. Layering and the OSI model; switching; local, metropolitan, and wide area networks; datagrams and virtual circuits; routing and congestion control; internetworking. *Prerequisite: CSE 120 or consent of the instructor.*

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.*

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 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.*

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 and CSE 100.*

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 and CSE 131A.*

CSE 132. Database System Principles (4)
(Formerly CSE 176) 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.*

CSE 133. Information Retrieval (4)
(Formerly CSE 181) How to find "relevant" documents (e.g., and 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 102.*

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, CSE 30. CSE 140L must be taken concurrently.*

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)
(Formerly CSE 170B) Introduction to computer architecture. Computer system design. Processor design. Control design. Memory & I/O systems. *Prerequisites: CSE 140, CSE 140L, or consent of the instructor. CSE 141L must be taken concurrently.*

CSE 141L. Project in Computer Architecture (2)
Hands-on computer architecture project aiming to familiarize students with processor, control and memory, and I/O systems. *Prerequisites: CSE 140, CSE 140L, or consent of the instructor. CSE 141 must be taken concurrently.*

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 143. Microelectronic System Design (4)
(Formerly CSE 172A) VLSI process technologies; circuit characterization; logic design styles; clocking strategies; computer-aided design tools; subsystem design; design case studies. System design project from hardware description, logic synthesis, physical layout to design verification. *Prerequisites: CSE 140, CSE 141.*

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 141 and CSE 141L, or consent of the instructor.*

CSE 145. Microprocessor Systems Design (4)
(Formerly CSE 175C) Writing and debugging programs on a microprocessor development system. Real time interfacing considerations with peripheral integrated circuits. Introduction to implementation of a real time operating system, an on-line debugger and real time interrupts for timing and I/O. *Prerequisites: CSE 30, CSE 140, and CSE 140L.*

CSE 150. Programming Languages for Artificial Intelligence (4)
(Formerly CSE 162) Experience using LISP, Prolog, and an object-oriented language to solve typical problems from artificial intelligence. Examples involving search and inference, including forward and backward chaining, and resolution theorem

proving. Relative advantages and disadvantages of these languages, and considerations for selecting a language for a particular problem will be discussed. *Prerequisites: CSE 10 or CSE 11, CSE 12, and CSE 100. CSE 100 may be taken concurrently.*

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.*

CSE 160. Introduction to Parallel Computation (4)
(Formerly CSE 174) General introduction to parallel computation focusing on important current topics and issues in parallel architecture, algorithms and software. Topics include parallel machine organization, parallel algorithm paradigms, parallel programming environments and tools, and heterogeneous computing. Parallel programming and project assignments given to provide hands-on experience. *Prerequisite: upper-division standing or consent of the instructor.*

CSE 164A. Introduction to Scientific Computation (4)
Basic techniques for solving numerical problems: Taylor series, error-analysis, interpolation, numerical differentiation and integration, root finding, systems of linear equations, and other topics at the discretion of the instructor. (Students may receive credit for only one of the following courses: CSE 64, CSE 164A, ECE 104, Math. 74, 173, 174, Phys. 105, AMES 153, 154. No credit for CSE 164A will be given if Math. 170ABC has already been taken.) *Prerequisites: CSE 12 and Math. 2DA/2DH, or consent of the instructor.*

CSE 164B. Advanced Scientific Computation (4)
Introduction to vector computation and an overview of numerical methods and implementation techniques for solving scientific problems. Case studies of canonical scientific problems, including matrix factorization, ordinary and partial differential equations. Analytic performance models, and cost performance tradeoffs. *Prerequisites: CSE 160, CSE 164 and Math.2EA/2EH, or consent of the instructor.*

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/2EH and CSE 100.*

CSE 195. Teaching (2 or 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

200. Computability and Complexity (4)
(Formerly CSE 265B.) Undecidability, recursive and r.e. sets. Recursive function theory, primitive and general recursive functions. Time and space complexity. Theory of NP: reducibilities, approximation, completeness. Intractability and complete problems for EXPSPACE. *Prerequisite: CSE 105 or CSE 206 or equivalent.*

201. Applied Computability and Complexity (4)
(Formerly CSE 261.) Models of computation: finite automata, context-free grammars, Turing machines, random access machines and circuits. Undecidability. First order logic. Complexity: time and space, theory of NP and P, intractability. Intended for students in the computer engineering program. *Prerequisite: CSE 105 or CSE 206 or equivalent. A student may not receive credit for both CSE 201 and CSE 200.*

202. Algorithm Design and Analysis (4)
(Formerly CSE 279.) 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 consent of instructor.*

203. Combinatorial Algorithms (4)
(Formerly CSE 268A.) This course presents combinatorial algorithms commonly used in computer science. These algorithms include shortest paths, maximum flow, multi-terminal maximum flows, PERT network, dynamic programming, backtrack, binary trees, greedy algorithms, and matrix computation. *Prerequisite: consent of instructor.*

204. Mathematical Programming (4)
(Formerly CSE 268B.) Convex function, separating hyperplanes. Linear programming, simplex method, quality complementary slackness. Revised simplex method, column-generating techniques in LP. Integer programming. *Prerequisite: consent of instructor.*

205. Complexity of Intractability (4)
(Formerly CSE 265C.) Intractability. Relativized complexity. Circuit complexity: size and depth, alternation. Efficient and optimal algorithms: matrix and arithmetic. Axiomatic complexity. Other advanced topics. *Prerequisites: CSE 200 and consent of instructor.*

206. Automata, Formal Languages, and Computability (4)
(Formerly CSE 265A.) Finite automata: non-determinism, regular expressions, regular grammars, 2-way FSAs, minimal state FSAs, context-free languages: normal forms, pumping lemmas, recognition algorithms, push-down automata, DCFLs. Turing Machines; variations on TMs, recursive and r.e. sets, universal TMs, Church's thesis, diagonalization, reducibility, Chomsky Hierarchy. *Prerequisites: CSE 105 or equivalent, consent of instructor.*

208A. Topics in Complexity of Algorithms and Data Structures (4)
(Formerly CSE 268C.) Advanced topics in concrete complexity, including decision trees and branching programs, advanced data structures, boolean circuits, communication complexity, and randomized algorithms. Content may vary from year to year; may be repeated for credit with consent of instructor.

208B. Topics in Parallel Complexity Theory (4)
(Formerly CSE 281Z.) Advanced seminar in theoretical aspects of parallelism, including variants of parallel computation thesis, circuits and PRAM models, speedup of sequential computations, universal parallel machines, inherently sequential problems, complexity classes AC, NC, SC. (S/U grades permitted.) *Prerequisites: CSE 200 and consent of instructor.*

208C. Topics in Theoretical Computer Science (1-4)
Topics of special interest in theoretical computer science. Topics may vary from quarter to quarter. May be repeated for credit with the consent of instructor. *Prerequisite: consent of instructor.* (S/U grades permitted.)

209. Seminar in Theoretical Computer Science (1-4)
Topics of special interest in theoretical computer science to be presented by staff members and students under faculty direction. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades only.)

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.*

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.*

220. Computer Systems (4)
Review of basic principles of computer systems. Key topics from the areas of operating systems, networks, distributed systems and performance evaluation: parallel processes, synchronization, communication protocols, distributed systems, hierarchical and distributed storage architectures, distributed concurrency control and transactions, computer security, and queueing models.

221. Operating Systems (4)
(Formerly CSE 264B.) 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.*

222. Communication Networks (4)
(Formerly CSE 281L.) Computer communication network concepts, techniques, protocols, and architectures, with emphasis on analysis of algorithms and protocols, performance tradeoffs, and design methodologies. Topics will include layering, data link control, routing, flow control, topological design, performance evaluation techniques (measurements, analysis, and simulation). *Prerequisite: CSE 123A or consent of instructor.* (S/U grades permitted.)

223. Distributed Systems (4)
(Formerly CSE 281N.) Basic structuring concepts: service, server, client-server relations, basic network architecture and point-to-point communication services, variable communication delays and failures, logical and physical time, time services, request/reply transport services, remote procedure calls, naming and directory services, distributed concurrency control, distributed file and database services, transactions and the atomic commit problem, security in distributed systems. (S/U grades permitted.) *Prerequisite: CSE 220 or CSE 221, or consent of instructor.*

224. Computer System Performance Analysis (4)
(Formerly CSE 281R.) Experimental and analytical approaches. Design, measurement, simulation, and modeling for system performance evaluation. Measurement tools such as workloads, benchmarks, experimental design: confidence intervals, analy-

sis of data; simulation: trace driven, Monte Carlo, transient removal; modeling: Little's Law, queueing, mean-value analysis. (S/U grades permitted.) *Prerequisite: CSE 220 or consent of instructor.*

228A. I/O Systems Software (4)
This course focuses on the general architecture and basic mechanisms of I/O system software, including device drivers and device-independent software which allows interaction between the kernel or user processes, and devices. Topics to be covered include I/O system architecture design, device driver design, buffering, caching, programmed I/O vs. DMA, synchronization, flow control, memory-mapped devices, bus architectures (e.g., SCSI, S-bus, Turbochannel, Microchannel), and efficiently moving data. (S/U grades permitted.)

228B. Storage Systems (4)
(Formerly 281F.) 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 220 or consent of instructor.*

228C. Communications Software (4)
Internetworking: concept and architectural model, and comparison with other network architectures. Addressing and address resolution, conventions. The Internet datagram Protocol, gateway protocols and routing. The ICMP and network control and testing. Transport layer protocols, adaptive flow control, high-speed extensions. Experimental and other protocols. *Prerequisites: CSE 221 and CSE 123A, or consent of instructor.* (S/U grades permitted.)

228D. Real-Time Systems (4)
Basic concepts (periodic, sporadic processes, static vs. dynamic scheduling) specification, time and clocks, scheduling and timing analysis, real-time programming languages, real-time operating systems, software engineering. *Prerequisite: CSE 221 or CSE 220, or consent of instructor.* (S/U grades permitted.)

228E. Fault-Tolerant Systems (4)
(Formerly CSE 281E.) Services, servers, and the depends-upon relation, failure classification, failure semantics, failure masking, exception handling: detection, recovery, masking and propagation, termination vs. resumption in exception handling, fail-stop processors and I/O controllers, reliable storage, reliable communication, process groups, synchronous and asynchronous group membership and broadcast services, automatic redundancy management, case studies of fault-tolerant systems. *Prerequisite: CSE 220 or CSE 221, or consent of instructor.*

228F. Multimedia Systems (4)
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.* (S/U grades permitted.)

229. Seminar in Computer Systems (1-4)
Topics of special interest in computer systems to be presented by staff members and students under faculty direction. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades only.)

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.*

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.*

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.*

233. Database Theory (4)
(Formerly CSE 280Z.) The course is a rigorous introduction to the theory of databases. Topics include the theory of query languages, dependency theory, deductive databases, complex objects, object-oriented databases, and other advanced topics and research issues as time allows. Evaluation will be done by homework and research projects. (S/U grades permitted.) *Prerequisites: one of CSE 132 or CSE 232, and CSE 200 or consent of instructor.*

238. Topics in Programming Language Design and Implementation (4)
Current topics in programming language design and implementation such as intermediate representations for software tools, cost models, optimizing for high-performance or parallelism, optimization of object-oriented languages, and use of AI techniques in compilers. (S/U grades permitted.) May be repeated three times for credit. *Prerequisite: CSE 231 or consent of instructor.*

238A. Topics in Knowledge Bases (4)
(Formerly CSE 281S.) The course will cover a variety of topics lying at the intersection of databases and artificial intelligence. Possible topics include reasoning about knowledge; logic and complexity; logic and probability (0/1 laws); logic programming for databases representing and handling negative, incomplete, and indefinite (disjunctive) information; deductive databases; logic databases; "smart" query systems. (S/U grades permitted.) *Prerequisite: consent of instructor.*

240. Principles in Computer Architecture I (4)
(Formerly CSE 270A.) Architectural description tools, performance evaluation, uniprocessor issues, including I-unit and E-unit concepts, RISC/CISC issues, bottlenecks, I/O channels and processors, micro- and nano-programming, memory hierarchy, virtual machines, high-level language machines. Performance enhancements: pipelining, instruction lookahead, branch prediction, reduced semantic dependencies. *Prerequisite: CSE 141 or consent of instructor.*

241. Advanced Computer Architecture (4)
(Formerly CSE 270B.) Traditional and current topics in parallel computer architecture, including Amdahl effect, attached processors, vector supercomputers, SIMD machines, MIMD machines, degrees of coupling, interconnection networks, memory issues, systolic arrays. Networks and distributed systems, massive parallelism, neural networks, shared memory model. *Prerequisite: CSE 240 or consent of instructor.*

242. Design Systems for VLSI Circuits (4)
(Formerly CSE 281U.) Introduction to VLSI circuits; layout design entry; logic design entry; symbolic layout; layout compaction; logic simulation; circuit simulation; design for testability; two-level logic synthesis; multi-level logic synthesis. (S/U grades permitted.) *Prerequisite: consent of instructor.*

243. Computer-Aided Design for VLSI (4)
(Formerly CSE 281V.) Microarchitecture synthesis; logic synthesis; synthesis systems for testability insertion; intelligent silicon compilation; synthesis systems for digital signal processing; expert systems in design automation; control unit synthesis; hardware description language issues; design automation databases. (S/U grades permitted.) *Prerequisite: consent of instructor.*

248A. Application of Combinatorial Algorithms to CAD (4)
(Formerly CSE 281D.) Description of models in VLSI design. Current literature in CAD. Application of combinatorial algorithms and mathematical programming techniques to circuit layout, array computation, etc.

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.*

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.*

251. Natural Language Processing (4)
(Formerly CSE 281W.) A survey of the traditional approaches to natural language processing, including basic parsing, knowledge representation, and discourse analysis. Material covered in the survey will be chosen from such topics as augmented transition networks, case grammars, semantic networks, and unification grammar. (S/U grades permitted.) *Prerequisites: graduate standing and either 151 or consent of instructor.*

252. Computer Vision (4)
(Formerly CSE 281M.) Illuminant, surface, and camera models. The role of irradiance, chrominance, stereo disparity, optical flow, and texture in computing interpretations of images. Edge detection, image segmentation, local and global constraints from segment boundaries. Object representations and algorithms for recognition. Extremum problems in vision, including regularization and maximum-likelihood techniques. Relation to human vision. *Prerequisite: Math. 2ABCDE or equivalent.* (S/U grades permitted.)

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.)

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.*

255. Intelligent Systems (4)
Basic knowledge representation and problem-solving method. Expert system architectures, languages, and tools. Scheduling, planning, diagnosis, and training applications. Fuzzy logic and heuristic control. Neural network, decision tree, and statistical methods for data mining. Guidelines for successful intelligent system deployment. (S/U grades permited.) *Prerequisite: CSE 151 or graduate standing in the Advanced Manufacturing Program, or consent of instructor.*

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.*

258B. Topics in Distributed Artificial Intelligence (4)
(Formerly CSE 281Q.) Topics in distributed artificial intelligence, including task decomposition; organizational structures; dealing with uncertainty; global coherence; decentralized decision making; cooperation and coordination techniques; computation vs. communication tradeoffs; real-time decentralized control; survey of past work. (S/U grades permitted.) *Prerequisite: graduate standing, consent of instructor, CSE 250B recommended.*

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.*

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.*

261. Parallel and Distributed Computation (4)
(Formerly CSE 274B.) The course concentrates on developing easy-to-parallelize numerical algorithms for optimization without being specific on the implementation. Topics are selected from iterative methods for linear and nonlinear equations; network problems; asynchronous algorithms and partially asynchronous iterative methods. *Prerequisite: consent of instructor.*

262. System Support for Parallel Scientific Computation (4)
(Formerly CSE 274C.) This course will explore issues arising out of the design of software support for concurrent numerical computation. Topics will include programming models, software portability, load balancing, and some numerical analysis. The course will terminate in a project. *Prerequisite: none.*

263. Parallel Algorithms (4)
(Formerly CSE 274D.) An introductory course in parallel algorithms on mesh, tree, hypercube, PRAM, and related architectures. The algorithms include sorting and routing, matrix algorithms, graph algorithms, and fast Fourier transform. *Prerequisites: CSE 202, CSE 260, or consent of instructor.*

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.*

268B. Topics in Advanced Scientific Computation (4)
(Formerly CSE 281B.) Current topics of interest in parallel scientific computation will be considered, including dynamic load balancing, efficient implementation techniques, and performance issues.

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.*

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.)

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.)

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.)

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.*

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.)

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)
Prerequisite: consent of instructor. (S/U grades only.)

501. Teaching (1-16)
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 grades only.) *Prerequisite: consent of department chair.*

Electrical and Computer Engineering (ECE)

OFFICE: 2904 Engineering Building, Unit 1, Warren College

Professors

Anthony S. Acampora, Ph.D.
Victor C. Anderson, Ph.D., *Professor Emeritus*
Peter M. Asbeck, Ph.D.
H. Neal Bertram, Ph.D.
William S. C. Chang, Ph.D., *Chair, Research Professor*
William A. Coles, Ph.D., *Vice Chair*
Shaya Fainman, Ph.D.
Jules A. Fejer, D.Sc., *Professor Emeritus*
Carl W. Helstrom, Ph.D. *Professor Emeritus*
Ramesh Jain, Ph.D.
Walter Ku, Ph.D.
S. S. Lau, Ph.D.
Sing H. Lee, Ph.D.
Robert Lugannani, Ph.D.
Huey-Lin Luo, Ph.D.
Elias Masry, Ph.D.
D. Asoka Mendis, Ph.D., *Professor Emeritus*
Laurence B. Milstein, Ph.D.
Kevin B. Quest, Ph.D.
Bhaskar Rao, Ph.D.
Barnaby J. Rickett, Ph.D.
Manuel Rotenberg, Ph.D., *Professor Emeritus*
M. Lea Rudee, Ph.D., *Research Professor*
Vitaly Shapiro, Ph.D.
Paul H. Siegel, Ph.D.
David Sworder, Ph.D., *Associate Dean, OGSR*
Mohan Trivedi, Ph.D.
Charles W. Tu, Ph.D.
Harry H. Wieder, Ph.D., *Professor Emeritus*
Jack K. Wolf, Ph.D.
Paul Yu, Ph.D.

Associate Professors

Paul Chau, Ph.D.
Rene L. Cruz, Ph.D.
Clark Guest, Ph.D.
Sadik Esener, Ph.D.
Karen Kavanagh, Ph.D.
Kenneth Kreutz-Delgado, Ph.D.
George J. Lewak, Ph.D., *Professor Emeritus (not-in-residence)*
Farrokh Najmabadi, Ph.D.
Ramesh Rao, Ph.D.
Anthony Sebald, Ph.D.
Kenneth A. Zeger, Ph.D.

Assistant Professors

Teresa L. Cheeks, Ph.D.
Pamela C. Cosman, Ph.D.
Ting-Ting Y. Lin, Ph.D.

Edward T. Yu, Ph.D.
Kenneth Y. Yun, Ph.D.

Adjunct Professors

Robert Hecht-Nielsen, Ph.D., *Hecht-Nielsen Neurocomputing Corporation*
John A. Hildebrand, Ph.D., *Marine Physical Laboratory*
James U. Lemke, Ph.D., *Center for Magnetic Recording Research*
James Zeidler, Ph.D., *Naval Ocean Systems Center*

Associated Faculty

Gustaf O. S. Arrhenius, Ph.D., *Professor, Scripps Institution of Oceanography*
William B. Hodgkiss, Ph.D., *Professor, Scripps Institution of Oceanography*

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 a wide variety of employment.

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 in the fall and winter quarters of 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 Electrical Engineering Program has been accredited by the Accreditation Board of Engineering and Technology (ABET).

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 focuses on basic physics 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 treats 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.

B.S. Curricula

B.S. programs in electrical engineering and engineering physics have nearly the same lower-division requirements while those for computer engineering are considerably different. Students should choose their major as soon as possible to ensure the correct lower-division preparation. Failure to do so will make it more difficult to complete a B.S. program in four years.

For graduation, each student must also satisfy general-education requirements determined by the student's college. The five 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) Recommended Schedule

FALL	WINTER	SPRING
FRESHMAN		
Math. 20A	Math. 20B	Math. 20C
CSE 10	Phys. 2A	Phys. 2B
Chem. 6A	ECE 20A	ECE 20B
GER	GER	GER
SOPHOMORE		
Math. 20F	Math. 20D	Math. 20E
Phys. 2C	Phys. 2D	GER
ECE 30 or CSE 30	ECE 60A	ECE 60B
GER	GER	ECE 60L

Summary of Requirements

Mathematics (24 units): Math. 20A-B-C-D-E-F. Students will be allowed to use another mathemathics sequence **only** if they transfer from another department on campus, junior college, or other university.

Physics (16 units): Phys. 2-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.

Computer Science (4 units): CSE 10.

Electrical Engineering (24 units): ECE 20A-B (should be completed by the end of the freshman year), ECE 30 or CSE 30, ECE 60A, ECE 60B, and ECE 60L.

Upper-Division Requirements (total of 72 units) Recommended Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 101	ECE 107	Elective (c)
ECE 102	ECE 108	Depth #1
ECE 103	ECE 109	Depth #2
GER	GER	GER
SENIOR YEAR		
Depth #3	Depth #4	Depth #5
Elective (c)	Eng. Design (b)	Elective (c)
Elective (c)	Elective (c)	Elective (c)
GER	GER	GER

Requirements by Discipline

a. **Electrical Engineering BREADTH Courses (24 units)**

Courses required of all electrical engineering majors:

ECE 101, 102, 103, 107, 108, 109. Except for ECE 102 which is a prerequisite for ECE 108, the breadth courses are not prerequisites to each other and can be taken independently. The ECE department recommends the following order:

Fall quarter

ECE 101 Linear Systems Fundamentals
ECE 102 Introduction to Active Circuit Design
ECE 103 Fundamentals of Devices and Materials

Winter quarter

ECE 107 Electromagnetism
ECE 108 Digital Circuits
ECE 109 Engineering Probability and Statistics

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.

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 117: Data Acquisition and Process Control
   - 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 the departmental approval for the design credit. The project must meet the same specifications as ECE192.

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. Normally these will be upper-division courses in engineering, mathematics, or natural science. Students may also choose electives from the lower-division or from other departments, such as humanities, social sciences, or arts, provided that they fit into a coherent professional program. Electives other than upper-division engineering, mathematics, or natural science must be justified in terms of such a program, and must be approved by a faculty adviser.

  (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 are encouraged to choose one of the approved depth sequences listed below, but they may also propose others. Some of the approved sequences have lower-division prerequisites and thus list six courses. Students choosing one of these sequences will have only two "diversity" electives. Guidelines for meeting the depth requirement can be obtained from the undergraduate office. Special sequences must be approved by the undergraduate affairs committee.

Electronics Circuits and Systems:
ECE 162A, 163, 164, 165, and 166 or 162B.

Electronic Devices and Materials:
ECE 135A, 136L, 135B, 139, and 183.

Controls and Systems Theory:
ECE 171A, 174, 171B, 117, and 173.

Machine Intelligence:
ECE 173, 174, 172A, 175, and 186.

Photonics:
ECE 181, 182, 183, 184, and 185.

Communications Systems:
ECE 171A or 162A, 153, 154A, 154B and 154C.

Networks:
ECE171A or 162A, 153, 159A, 158A, and 158B.

Queuing Systems:
ECE 171A, 174, 159A, 159B, and 159C.

Computer Design:
CSE 12, 21, and 141, ECE158A, 111 or 117 or 119, and 165.

Software Systems:
CSE 12, 21, 100, 101, 141, and 120.

Visual Computing:
CSE12, ECE78, 172A, 186, 178, and ECE162A or 184 or CSE167.

B.S. Engineering Physics

The engineering physics degree combines a strong program in physics with most of the requirements for a B.S. degree in electrical engineering. Students must complete a total of 180 units for graduation, including the general education requirements. Note that 146 units (excluding general education) are required.

Lower-Division Requirements (total of 74 units) Recommended Schedule

FALL	WINTER	SPRING
FRESHMAN YEAR		
CSE 10	ECE 20A	ECE 20B
Math. 20A	Math. 20B	Math. 20C
Chem. 6A	Phys. 2A	Phys. 2B
GER	GER	GER

SOPHOMORE YEAR		
ECE 30 or CSE 30	ECE 60A	ECE 60B
Math. 20F	Math. 20D	Math. 20E
Phys. 2C	Phys. 2D	ECE 60L
GER	Phys. 2DL	GER

Mathematics (24 units): Math. 20A-B-C-D-E-F. Students will be allowed to use another mathematics sequence **only** if they transfer from another department on campus, or community college, or other university.

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.

Computer Science (4 units): CSE 10.

Electrical Engineering (24 units): ECE 20A and 20B (should be completed by the end of the freshman year), ECE 30 or CSE 30, ECE 60A, ECE 60B and ECE 60L.

Upper-division requirements (72 units)

FALL	WINTER	SPRING
JUNIOR YEAR		
Math. 110	ECE 101	ECE 108
Phys. 110A	ECE 102	ECE 109
ECE 103	ECE 107	Phys. 130A
GER	GER	GER
SENIOR YEAR		
ECE 124	Elective (d)	ECE 123
Phys. 130B	Eng. Design (c)	Elective (d)
Phys. 140A	Elective (d)	Elective (d)
GER	GER	GER

Summary by Discipline

a. Engineering Physics BREADTH Courses (24 units)

Courses required of all engineering physics majors:

ECE 101, 102, 103, 107, 108, 109. Except for ECE 102 which is a prerequisite for ECE 108, the breadth courses are not prerequisites to each other and can be taken independently. The ECE department recommends the following order:

Fall quarter

ECE 103 Fundamentals of Devices and Materials

Winter quarter

ECE 101 Linear Systems Fundamentals
ECE 102 Introduction to Active Circuit Design
ECE 107 Electromagnetism

Spring quarter

ECE 108 Digital Circuits
ECE 109 Engineering Probability and Statistics

b. Engineering Physics DEPTH Courses (28 units)

All B.S. engineering physics students are required to take Phys. 110A, 130A, 130B, 140A, Math. 110, ECE 123-124.

c. 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.

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 117: Data Acquisition and Process Control
   - 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 the departmental approval for the design credit. The project must meet the same specifications as ECE192.

d. 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. Normally these will be upper-division courses in engineering, mathematics, or natural science. Students may also choose electives from the lower-division or from other departments, such as humanities, social sciences, or arts, provided that they fit into a coherent professional program. Electives other than upper-division engineering, mathematics, or natural science must be justified in terms of such a program, and must be approved by a faculty adviser.

  (For additional information, please refer to the section on Elective Policy for Electrical Engineering and Engineering Physics Majors.)

Elective Policy for Electrical Engineering and Engineering Physics Majors

The following regulations apply to extra departmental courses used as electives in the Electrical Engineering and Engineering Physics curricula.

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, Phys. 100C and ECE 124.

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, 6C 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 diversity electives but not the three math/physics/engineering electives.

Mathematics: Math. 180A-B overlap ECE 109 and 153, and therefore will not qualify for elective credit of either type. All lower-division mathematics is excluded from elective credit of either type.

AMES: Credit will not be allowed for AMES 139, 141, 163, 170, or 105.

CSE: The following courses are excluded as electives: CSE 1, 2, 5A, 5B, 10, 11, 140 (duplicates ECE 20B or 81), 140L (duplicates ECE 20B

or 82), 143 (duplicates ECE 165). CSE 12, 20, and 21 will count toward the three diversity electives.

Special Studies Courses 195–199: At most four units of 195–199 may be used for elective credit.

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 144 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 68 units) Recommended Schedule

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 20A	Math. 20B	Math. 20C or 21C~
CSE 10	CSE 20	CSE 12
GER	Phys. 2A	Phys. 2B
GER	GER	GER
SOPHOMORE YEAR		
Math. 20D or 21D~	Math. 20F	ECE 151
ECE 30 or CSE 30	Phys. 2C	Phys. 2D
ECE 53@	CSE 21	Phys. Lab
ECE 54@	GER	GER

~ either (20C and 20D) or (21C and 21D).
@ECE 53 and 54 must be taken concurrently.

Summary by Discipline

Mathematics (20 units): Math. 20A, 20B, either 20C and 20D or 21C and 21D, and 20F.

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. 2BL or 2CL or 2DL. The lab course should be taken concurrently with the Phys. 2 or Phys. 4 sequence.

Computer Science (20 units): CSE 10, 12, 20, 21, and ECE 30 or CSE 30.

Electrical Engineering (6 units): ECE 53 and 54. These courses must be taken concurrently.

Upper-Division Requirements (total of 76 units)

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 102	ECE 108	GER
CSE 100	CSE 101	CSE 105
CSE 140#	CSE 141*	CSE 120
CSE 140L#	CSE 141L*	T.E.
SENIOR YEAR		
ECE 101	T.E.	GER
CSE 131A	CSE 131B	T.E.
T.E.	T.E.	ECE 171A or 162A
GER	GER	T.E.

#CSE 140 and 140L must be taken concurrently.
*CSE 141 and 141L must be taken concurrently.

Summary by Discipline

a. All B.S. computer engineering students are required to take CSE 100, 101, 105, 120, 131A, 131B, 140, 140L, 141, 141L.

b. In addition, all B.S. computer engineering students must fulfill the following upper-division ECE requirements:
   - 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 162A).

c. Technical electives: All B.S. computer engineering majors are required to take six technical electives.
   - One technical elective must be either CSE 145, ECE 117, or ECE 119.
   - 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 should get instructor's permssion 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 course except Math. 166A-B, 168A-B, 176A-B, 179A-B, 184A-B, 186A-B, 188, 189A-B-C, 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, ECE 104, Math. 174, Math. 173, Phys. 105, AMES 153, AMES 154. No credit for any of these courses will be given if Math. 170A-B-C is taken.

Computer Science and Engineering: CSE 143 is equivalent to ECE 165. Students may not get credit for both CSE 123A and ECE 158A or for both ECE 151 and ECE 109.

Cognitive Science: Fundamental Cognitive Phenomena 101A-B-C, Cognitive Neuroscience 107A-B-C, Modeling Cognitive Phenomena 108A, 108AL, 108P, Everyday Cognition 130, Distributed Cognition 131, Cognitive Engineering 132, Observation, Protocol, and Discourse Analysis 141, Semantics 150, Language Comprehension 153, Natural and Artificial Symbolic Representational Systems 170, Advanced Parallel Distributed Processing 181, Advanced Artificial Intelligence Modeling 182.

Students may not get credit for both CSE 150 and Cog. Sci. 108M or for both CSE 151 and Cog. Sci. 108A/182.

Applied Mechanics and Engineering: All upper-division AMES courses except AMES 163A-B.

Students may receive elective credit for only one of the following courses: CSE 164A, ECE 104, Math. 174, Math. 173, Phys. 105, AMES 153, AMES 154. Students may only get credit for one of the two courses, CSE 167 or AMES 157.

Economics: Microeconomics 100A-B, Game Theory 109, Macroeconomic 110A-B, Mathematical Economics 113, Econometrics 120A-B-C, Applied Econometrics 121, QEDS Microeconomics 170A-B, Decision Under Uncertainty 171, Introduction to Operations Research 172A-B-C, Economic Forecasting 178.

Linguistics: Phonetics 110, Phonology 111, 115, Grammatical Structure 120, Syntax 121, 125, Semantics 130, Formal Linguistics 160, Computational Linguistics 163, Psycholinguistics 170, Language and the Brain 172, and Sociolinguistics 175.

Minor Curricula

The following sets of courses represent a variety of minor curricula in the area of electrical and computer engineering. A minor will typically consist of one of the following upper-division sequences and three of the lower-division prerequisite courses. The upper-division courses must be distinct from courses in the student's major; some overlap may be permissible in the lower-division courses. Students should consult their college provost's office concerning the rules for the minor or program of concentration. The general university rule is that a minor consists of at least six courses, including at least three at the upper-division level.

1. Digital Hardware: ECE 117, 119, CSE 140
2. Transistors and Circuits: ECE 102, 103, 108
3. Systems: ECE 101, 171A, 171B
4. Signals and Noise: ECE 101, 109, 153
5. Electronic Devices and Materials: ECE 103, 135A, 135B
6. Electromagnetism: ECE 107, 123, 124

[illegible]

Admission to ECE Majors

Admission to upper-division ECE courses is based on the GPA in required lower-division courses.

Students must complete the following courses in order to apply to the Department of Electrical and Computer Engineering:

Electrical Engineering and Engineering Physics majors:

1. Math. 20A-B-C
2. Phys. 2A-B
3. ECE 20A-B
4. CSE 10

Computer Engineering majors:

1. Math. 20A-B-C
2. Phys. 2A-B
3. CSE 10, 12, 20

Currently, students who have a 2.0 overall GPA and a minimum of C or better in the screening courses are admissible as ECE majors. This GPA cutoff level may be raised at any time, should the number of majors exceed the capacity of the department.

Students who wish to enroll in an ECE major should apply to the department undergraduate office, in accordance with the Division of Engineering admissions policy. Rules for transfer students are described below.

Transfer Students

Requirements for admission to the major curricula are the same for both transfer students and continuing students. When planning their program, students should be mindful of lower-division prerequisites necessary for admission to upper-division courses.

Students who wish to enter an ECE major curriculum must apply to 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

A GPA of 2.0 is required in all upper-division courses in the major, including technical electives. No more than two courses with a D grade may be counted towards the major. The grade of D will not be considered an adequate prerequisite for any ECE course. 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. An adviser will be assigned by the ECE department undergraduate office.

[illegible]

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" is 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 equivalent.**

- Transfer students entering in the fall of 1996 will have to follow the new curriculum and 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 60A	ECE 60B ECE 60L

[redacted]

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 winter 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 24 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 approved in their application.

Procedure for Application to the Honors Program:

By the end of the winter quarter of their junior year, and no later than the fall quarter (second week) 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.S. Program

Undergraduates in the ECE Department who have maintained a distinguished academic record in both departmental and overall course work are encouraged to participate in the five-year B.S./M.S. program offered by the department. Participation in the program will permit students to complete the requirements for the M.S. degree within one year following the 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 to the B.S./M.S. program, including three letters of recommendation, by the end of the winter quarter of their third year. No GRE's are required for this application. A minimum GPA of 3.25 overall and 3.5 in the major, and strong letters of recommendation are normally required for admission.

Continuation in the Program

In the fall of the fourth year, applications for graduate admission will be forwarded by the ECE department to the UCSD Office of Graduate Studies and Research for all students in the B.S./M.S. program. Each student will be required to pay the regular graduate application fee at this time. Students will be automatically accepted into the graduate program providing that their overall GPA, through the fall quarter of the fourth year, remains above 3.25.

All students must complete the B.S. degree requirements with a GPA of at least 3.25 by the end of the fourth year. Students who have not met these requirements will not be allowed to enter the graduate program.

Students who have completed the B.S. degree are subject to the same requirements as those in the regular M.S. program. In particular they must maintain a graduate GPA of at least 3.0.

Curriculum

The M.S. program requires forty-eight units, of which twelve may be undergraduate and at least four units must be research. These may not overlap with units used to satisfy the B.S. requirements. It is seldom possible to complete these forty-eight units in one year. Normally it will be necessary for students in the B.S./M.S. program to complete at least twelve units in addition to the B.S. requirements before beginning their fifth year. These may be either graduate or undergraduate, and could include a summer project.

Students may elect M.S. Plan 1 (thesis) which requires twelve units of research, or Plan 2 (comprehensive exam) which requires four units of research and an exam. The thesis program is generally more time consuming and may be difficult to complete in five years unless substantial work on the thesis project is done before the fifth year.

Admission for graduate study through the B.S./M.S. program will be for the M.S. degree only. 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.

The Graduate Programs

The department offers graduate programs leading to the **M.S.** and **Ph.D.** degrees in ten

areas of research, two of which are interdepartmental. The degrees are titled M.S. or Ph.D. in Electrical and Computer Engineering. The research programs are discussed below.

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 Applied Mechanics and Engineering Sciences (AMES). 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 Optics and Photonics

The applied optics and photonics programs are complementary. Applied optics concentrates more on studying optical, opto-electronic devices, circuits, and processing that involve optical spatial light modulators as logic and memory devices; nonlinear optical crystals for image amplification, phase conjugation, and 3-D memory; micro-optics used in optical processors and diffractive optics for optical interconnects and integrated optical circuits; fiber optics, guided wave modulators, integrated optical and electronic devices, and circuits on III-V semiconductors; semiconductor injection lasers and detectors for optical communication.

In photonics, the strength of optics and electronics are combined to yield powerful optoelectronic systems that cannot be realized with electrons alone. This program at UCSD involves the design, prototyping, and application of optoelectronic systems to image processing, parallel computing, optical communication, and photonic networks. It is an interdisciplinary field among optical, electronic, computer, and communication scientists and engineers because many important issues in architecture, packaging, and algorithms need to be addressed in system design and applications. Current hardware system studies include multi-electronic processors with optical interconnects, optoelectronic neural networks, robotic vision (optical pattern recognition), data/knowledge-base systems with high I/O bandwidth, digital optical computing, and communication systems. Current software studies include developing optical CAD tools to be integrated with commercial electronic CAD for designing these hardware systems.

3. Communication Theory and Systems

Communication theory and systems in ECE involves the detection of signals, the prediction and filtering of random processes, the design and analysis of communication systems, the analysis of protocols for communication networks, and the statistical processing of images. Specific topics include the use of signal processing and error correction techniques for both digital communication systems and recording data in magnetic storage media, the use of spread spectrum techniques for wireless communications, and the design and analysis of multi-user communication networks. Additional areas of research include time series analysis, adaptive filtering, sampling design, and wavelet theory. Applications are made to such fields as communications, radar, sonar, oceanography, holography, image processing, and visibility in air and water. Both theoretical and practical aspects of information processing are studied.

4. Computer Engineering

Computer engineering at UCSD 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, software systems, and computer architecture. 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, data storage systems, and neuro-computing. The faculty is composed of interested members of the Departments of Electrical & Computer Engineering (ECE), Computer Science & 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

The electronic circuits and systems program involves the study of the processes of analysis and design of electronic circuits and systems. Emphasis is on analog and digital integrated circuits, very large-scale integration (VLSI), analog and digital signal processing, and system algorithms and architectures. Particular areas of study are: analog, digital, and microwave electronic circuits and systems, parallel and multiprocessor computing, electronic neural networks, and associative memories, VLSI and algorithmic/ application-specific integrated circuit (ASIC) design, microwave and millimeter wave integrated circuits (MIMIC), gallium arsenide ultra-high-speed integrated circuits and devices (UHSIC), algorithms and architectures for analog and digital signal processing (DSP), high-speed digital communications, computer arithmetic and numerical analysis of finite word length processors, fault-tolerant VLSI systems, design for testability, the design of reliable digital electronic systems, computer-aided design (CAD), and computer-aided engineering (CAE) of DSP/communications systems.

6. Electronic Devices and Materials

The field of electronic devices and materials includes the synthesis, characterization, and application of metals, semiconductors and dielectric materials; fabrication, evaluation, and modeling of prototype electronic and optoelectronic devices and integrated circuits based on group IV and compound semiconductors. Also included are processing methods and techniques employed in large-scale integrated circuits. Current research includes growth by molecular beam epitaxy and organo-metallic vapor phase epitaxy; the study of interfaces; the study of superconductors and tunneling phenomena; magnetic materials; and the electronic optical and electro-optic properties of heterojunction structures particularly in relation to high speed transistors, integrated circuits, and optoelectronic components. The department has available a complete facility for fabricating prototype silicon and III-V compound

transistors and other devices, a Rutherford backscattering facility, molecular beam epitaxy and metallorganic chemical vapor deposition apparatus, scanning tunneling microscopy, equipment for x-ray, optical, electro-optic, electrical and galvanomagnetic characterization of materials and devices, as well as comprehensive modeling capabilities.

7. Intelligent Systems, Robotics, and Control

This field focuses on the application of advanced computer and mathematical techniques to the problem of analysis and control of complex, uncertain dynamical systems in real time.

Consider, for example, the closed loop control of multiple robot arms in a changing environment. The intent is for the arms to cooperate in the performance of some complex task. The control loop is subject to external disturbances (e.g., changes in the environment), and the robot structural properties vary with changing loads. Measurement of the relevant states is made by conventional position or force sensors as well as image sensors (video cameras). These measurements are subject to both noise-random perturbations in the sensor outputs and artifacts (e.g., partial obscuration of the image field.) The need for good planning and control for nominal performance as well as proper emergency capability also complicates the design problem. The system must operate properly in a wide range of operating modes.

Similar issues arise in biomedical control problems and aerospace guidance and control problems. All of these designs require fusion of a complicated suite of sensors, computers, and problem dynamics into one integrated system. Again, the wide range of events to which the system is subject create an environment in which the controller must adapt itself to its perception of the operational conditions.

Faculty in the systems science group are involved in virtually all aspects of the field. Individual faculty are focusing on topics, including biomedical identification and control, advanced digital signal and image processing, image-based tracking and guidance systems, control of teleoperated vehicles, analysis and control of mobile multiarmed robot manipulators, and the integration of nontraditional approaches including neural networks, fuzzy adaptive control, and rule-based descriptions from LISP and PROLOG. Typically, advanced mathematical and computational techniques play the fundamental role in this work. Extensive computational support includes the UCSD CRAY (on campus) and a network of workstations.

In summary, the group is interested primarily in the study of intelligent systems.

8. Magnetic Recording

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 non-linearities, 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 theory of such propagation is also studied with a view to removing the distorting effects of the turbulent medium on astronomical observations and providing an accurate restoration of the intrinsic signals.

Space science is concerned with the nature of the sun, its ionized and super-sonic 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 are trained in one or more of the interrelated fields, electromagnetics, space plasma physics, radio astronomy, wave propagation, numerical methods, and signal processing.

10. Signal and Image Processing

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 two research centers and participates in several universitywide 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) and the Optoelectronics Technology Center (OTC) sponsored by the Advanced Project Research Agency.

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.

Graduate Requirements and Regulations

Admission

Admission to the graduate programs is in accordance with the general requirements of the Graduate Division, which requires at least a B.S. degree in a branch of engineering, physical sciences, or mathematics. Applications from students who wish to take interdisciplinary programs will also be considered. A minimum upper division GPA of 3.0 and strong letters of recommendation are necessary. In addition, the department requires all applicants to submit GRE general test scores; TOEFL scores are required from international applicants whose native language is not English.

Financial Aid

Some financial support is available through the department in the form of fellowships, research assistantships, and teaching assistantships. Assistantships are never more than half time in the academic year (by university rules), however RAs may be full time in the summer. Research assistantships are supported by research grants obtained by individual faculty members and are administered by that faculty member. Teaching assistantships are allocated by the department on the basis of merit and competence to teach the courses which need to be staffed. Fellowships are allocated by the department solely on the basis of merit. Fellowships, research assistantships, and teaching assistantships pay slightly different monthly stipends.

The department makes every attempt to continue the support of Ph.D. students who are making satisfactory progress, which includes maintaining a 3.4 GPA in technical courses. M.S. students may often obtain support but this is less assured. Application for financial support should be made at the time of admission. Such applications will be considered at any time, but can seldom be granted after the start of the academic year.

Advising

Students should seek advice on procedures and requirements from the departmental graduate office. In particular the graduate office will provide information on examination formats and schedules. All students will also be assigned a faculty academic adviser upon admission. Students in AOS should see the graduate office at SIO for advice on procedures and requirements; they will be assigned an academic adviser by that office.

Students in programs which require a thesis, i.e., M.S. Plan 1, and Ph.D., are responsible to find an adviser who is willing to supervise their research. This must be done in a timely manner and students should give it a high priority. Their research adviser will take over academic advising as well.

Degree Programs

The department offers both M.S. Plan 1 (thesis) and M.S. Plan 2 (comprehensive exam) and Ph.D. programs in accord with the general requirements of the university. Students admitted to the M.S. program may elect either Plan 1 or Plan 2 at any time. Students in either M.S. plan may apply for transfer to the Ph.D. program. If such application is approved by the admissions committee, the M.S. thesis or project may form the basis of the Ph.D. oral preliminary examination. Thus, it is wise to make any application for transfer well before taking the M.S. Plan 2 comprehensive examination, or presenting the M.S. Plan 1 thesis.

Course Requirements

The course requirements for the M.S. and Ph.D. programs are similar, forty-eight units 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 different programs maintain lists of core courses from which the thirty-six graduate units must be selected. These may be obtained from the graduate office. 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 in the M.S. Plan 1 (thesis option) must take twelve units of ECE 299 (research) as part of their thirty-six graduate units. Students in the M.S. Plan 2 (comprehensive exam option) and the Ph.D. programs may count no more than four units of ECE 299 towards their core course requirements.

Students in the Ph.D. programs, who already hold an M.S. degree in electrical engineering, must nevertheless satisfy the requirements for the core courses. However, graduate courses taken elsewhere can be substituted for specific courses with the approval of the academic adviser.

At least thirty-six units of graduate core course work must be taken for a letter grade except that ECE 299 (research) may only be taken on an S/U basis regardless of whether it is counted towards the core course requirements. Other courses used to fulfill degree requirements may be taken S/U only with the approval of the adviser. Students in the Ph.D. program must maintain a GPA of 3.4 in the core courses. Seminar courses in the 290 series, ECE 298 (independent study), and ECE 501 (teaching) may be taken only on an S/U basis.

The Comprehensive Examination

M.S. Degree Requirements

The department offers both M.S. Plan 1 (thesis) and Plan 2 (comprehensive exam) programs in accordance with the general requirements of the university. Students admitted to the M.S. program may elect either Plan 1 or Plan 2 at any time.

The course requirements for the M.S. programs are forty-eight units of which at least thirty-six units must be at the graduate level. Students in Plan 1 (thesis), must submit a thesis in accordance with the general requirements of the university. Thesis research work will count as twelve units. Students in the M.S. Plan 2*

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(comprehensive exam) must take four units of ECE 297** (project). This project will require a written report and will be presented to a committee of at least two ECE faculty members in an oral comprehensive examination.

It is the responsibility of the student to find a faculty member willing to supervise the master's thesis or project, to form the faculty examining committee, and to schedule the oral comprehensive examination.

Each discipline maintains a list of core courses from which the thirty-six graduate units must be selected. These lists may be obtained from the graduate office. 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 in the computer engineering discipline may take Plan 2 (project), or they may take the written comprehensive examinations in the Department of Computer Science and Engineering, according to the CSE guidelines.

**Currently, students should enroll in ECE 299.

Ph.D. Preliminary Evaluation

Students admitted into the Ph.D. program* must pass the departmental preliminary exam to satisfy the department's Ph.D. requirements. Though students are required to take the preliminary exam before the end of their second year, they are encouraged to take this exam as early as possible. Prior to taking this exam, they are expected to be making satisfactory progress toward the completion of required course work, identifying an adviser and area for Ph.D. research.

All first-year students not planning to take the exam in their first year will be evaluated in the spring, by a departmental committee. The evaluation is based on the overall record of the student's performance in course work and research.

Second-year students who have not taken the exam are encouraged to take the exam as early as possible, but no later than the spring quarter.

The oral exam is conducted by a three-member faculty committee. Students will give a thirty to forty-five minute presentation on a research topic of his or her interest, selected after consultation with the adviser. In addition, students will be examined for general proficiency in his or her area of specialization and material related to a two-quarter graduate sequence in ECE. This sequence is identified by the student prior to the exam and approved by the committee.

The Ph.D. preliminary evaluation is based on the student's overall record and performance, as well as the preliminary exam.

*Students in the computer engineering discipline may elect to take two written comprehensive examinations in the Department of Computer Science and Engineering, according to the CSE guidelines, in place of the oral examination on a two-quarter sequence in ECE. They are required to give the thirty to forty-five minute presentation in the ECE department.

Requirements Specific to the Doctoral Program

Students in the Ph.D. program must find a faculty member who will agree to supervise their 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 a departmental preliminary examination by the end of their second year of study. This is an oral exam in which the student presents his/her research to a committee of three ECE faculty members.

Students should begin defining and preparing for their thesis research as soon as possible, definitely before the end of their second year. They must plan on taking the University Qualifying Examination by the end of their third year. This is an oral exam at which the student will present his/her thesis proposal to a universitywide committee. After passing this exam the student is 'advanced to candidacy'. The final Ph.D. requirements are the submission of a thesis, and the thesis 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

The departmental preliminary exam must be taken before the end of the second year. The course requirements must be finished within two years. The university qualifying exam must be taken before the end of the fourth year. Total university support cannot exceed seven years (six years with master's degree.) Total registered time at UCSD cannot exceed eight years (seven years with master's degree.)

COURSES

The departmental will endeavor to offer the courses as outlined 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.

UNDERGRADUATE

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. One and a half hours of lecture. *Prerequisite: none.* (F,W,S) M.L. Rudee

5A. Our Natural and Artificial Environment: Atmosphere (4)
Descriptive introduction to the basic nature of the earth's atmosphere. Its interaction with the ocean and biosphere. Chemical and thermal pollution (effects of C02, aerosols, dust, etc.) and their climatic impact. Conventional and nonconventional energy resources and their environmental impacts. Three hours of lecture. *Prerequisite: none.* (F) A. Mendis

5B. Our Natural and Artificial Environment: Computers (4)
A descriptive introduction to computing systems and technology. Topics include: semiconductor manufacturing, digital logic, data storage and display technology; the basic component of computer systems; computer software; electronic networks and the role of computers in modern society. Three hours of lecture. *Prerequisite: none.* (W) E. Yu

5C. Our Natural and Artificial Environment: The Electron (4)
This course describes in the simplest possible terms the basic properties of electrons and how modern electronic devices used on a daily basis work. Topics will include such devices as calculators, lasers, telephone radio, etc. Three hours of lectures. *Prerequisite: none.* (S) S.S. Lau, T. Cheeks

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. Two hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisite: Math. 20A with a grade of C– or better, Math. 20B may be concurrent.* (W) A. Sebald

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. Two hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisites: Math. 20B, ECE 20A with grades of C– or better, Math. 20C may be concurrent.* (S) P. Yu

30. Introduction to Computer Engineering (4)
This course is designed to introduce 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.) Three hours of lecture, four hours of laboratory. *Prerequisite: CSE 10 or 11 with a grade of C– or better.* (F) T. T. Lin, R. Fellman

53. Fundamentals of Electrical Engineering (4)
This is a problem/design-oriented course for students majoring in other branches of science and engineering. The main topics are: passive circuit analysis, analog and digital systems, and active circuit analysis. The course is integrated with the ECE 54 laboratory which must be taken concurrently. Three hours of lecture, one hour discussion. *Prerequisites: Grades of C– or better in Phys. 2B, Math. 20C or 21C, Math. 20D or 21D (may be concurrent), ECE 54 (must be concurrent).* (F) S. Esener

54. Fundamentals of Electrical Engineering Laboratory (2)
Laboratory course integrated with ECE 53. Problem/design-oriented course for students majoring in other branches of science and engineering. Experiments will include: resistive circuits, measurements of frequency and step responses, operational amplified circuits and transistor circuits. All experiments will include simulations. One hour lecture, three hours of laboratory. *Prerequisites: Grades of C– or better in Phys. 2B and Math. 20C or 21C (Math. 20D or Math. 21D may be concurrent), ECE 53 (must be concurrent).* (F) S. Esener

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. Three hours of lecture, one hour of discussion, one hour of laboratory. *Prerequisites: Math. 20A-B-C-F , ECE 20A and 20B with grades of C– or better. Math. 20D may be concurrent.* (W) R. Lugannani

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. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 60A with a grade of C– or better.* (S) R. Lugannani

60L. Circuits and Systems Laboratory (4)
Essential aspects of electrical engineering. Topics covered include transient and steady-state response of RLC circuits, transistor circuits, operational amplifiers, nonlinear circuit components, power supplies, digital circuits and error analysis. The material complements the topics in ECE 60A and 60B. One and a half hours of lecture, three and a half hours of laboratory. *Prerequisites: ECE 20B, Phys. 2B, and Math. 20C or equivalent with grades of C– or better.* (W,S) M. Rotenberg

78. Introduction to Image Engineering (4)
Representation of images image file formats, image compression standards, image scanning and display, visual perception, and color spaces. Three hours of lecture, two hours of laboratory. *Prerequisites: Math. 20A-B-C-D-F, CSE 10.* (F) P. Cosman

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. One hour lecture. *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. Three hours of lecture, one hour of discussion. *Prerequisites: Math. 20A-B-C-D-F, ECE 60B and 60L or ECE 53-54 with grades of C– or better.* (F) R. Cruz

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. Three hours of lecture, one hour discussion, three hours of laboratory. *Prerequisites: Math. 20A-B-C-D-F, Phys. 2D, ECE 60B and 60L/or ECE 53-54 with grades of C– or better.* (F) W. Coles

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, non-ideal behavior. Metal-oxide-semiconductor structures, MOSFET's, device scaling. Three hours of lecture, one hour of discussion. *Prerequisites: Phys. 2D, Math. 20A-20F, ECE 60B and 60L with grades of C– or better.* (F) E. Yu

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. Three hours of lecture, one hour of discussion. *Prerequisites: Phys. 2D, Math. 20A-20F, ECE 60B and 60L with grades of C– or better.* (W) K. Quest

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. Three hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisites: ECE 102, ECE 30 or CSE 30 with grades of C– or better.* (W) S. Esener

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. Three hours of lecture, one hour of discussion. *Prerequisites: Math. 20A-B-C-D-F with grades of C– or better (ECE 101 recommended).* (W) R. Rao

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) K. Yun

117. Data Acquisition and Process Control (4)
Introduction to the design of microprocessor-based systems. Analysis of microprocessor architecture and functionality. Design of data acquisition and control systems. Memory mapped and DMA based I/O , interrupt driven systems, I/O standards, busses, and communications protocols will be discussed. Three hours of lecture, four hours of lab. *Prerequisites: ECE 30 or CSE 30, and ECE 20B or ECE 53 and CSE 140 with grades of C– or better.* (S) C. Guest and P. Chau

119. Concurrency and Real-Time Systems (4)
Advanced issues in microprocessor-based system design. Timing, synchronization, and concurrency in the hardware and software of digital systems. Interrupt driven systems; synchronous and asynchronous systems; hardware and software interaction and concurrent programming. Three hours of lecture, four hours of lab. *Prerequisites: ECE 30 or CSE 30 and ECE 20B or ECE 53 and CSE 140 with grades of C– or better. ECE 117 and CSE 145 recommended.* (W or S) T.T. Lin

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). Three hours of lecture. *Prerequisites: Phys. 2A-B or 4A-C and Math. 20A-B with grades of C– or better (Phys. 2C and Math. 20C recommended).* (S) N. Omidi

123. Electromagnetic Radiation (4)
The magnetic vector potential; far-field radiation from electric and magnetic sources; antennas and antenna arrays; aperture radiation, Fraunhofer and Fresnel diffraction; geometric optics. Three hours lecture, one hour discussion. *Prerequisite: ECE 107 with a grade of C– or better.* (S) E. Yu, K. Quest

124. Electromagnetic Wave Phenomena (4)
Electromagnetic plane waves; reflection and transmission by discontinuities; guided waves: TEM, TE, TM modes; resonators and Q factors; dielectric waveguides and optical fibers; optical beam propagation; electromagnetic properties of materials. Three hours lecture, one hour discussion. *Prerequisite: ECE 107 with a grade of C– or better.* (F) E. Yu, K. Quest

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. Three hours of lecture. *Prerequisites: Phys. 2C-D with grades of C– or better.* (S) K. Kavanagh

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. Three hours of lecture. *Prerequisite: ECE 103 with a grade of C– or better.* (S) H. L. Luo

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. Three hours of lecture. *Prerequisite: ECE 135A with a grade of C– or better.* (F) C. Tu

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. Three hours of lecture. *Prerequisite: ECE 103 with a grade of C– or better.* (S) P. Yu

136L. Microelectronics Laboratory (4)
Laboratory fabrication of diodes and field effect transistors covering photolithography, oxidation, diffusion, thin film deposition, etching and evaluation of devices. Two hours of lecture, three hours of laboratory. *Prerequisite: ECE 103 with a grade of C– or better.* (F,W,S) S. S. Lau

137. Materials Laboratory (4)
A laboratory course covering experimental concepts and approaches in the study of materials, including preparation, processing, alloying, crystal growing, physical metallurgy, and various techniques in the evaluation and characterization of materials. One hour lecture, four to six hours of laboratory. *Prerequisite: some background in solid-state physics or consent of instructor.* (S) H. L. Luo

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. Three hours of lecture. *Prerequisites: ECE 135A-B with grades of C– or better.* (W) P. Asbeck

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. Two hours of lecture, four hours lab. *Prerequisite: ECE 107 with a grade of C– or better or consent of instructor.* (F-W-S) J. Hildebrand

146. Fundamentals of Magnetic Recording (4)
Basic concepts of the magnetic recording process. Overview of magnetic hysteresis. Playback process for single and multiple transitions. Reciprocity theorem. Record process modeling. Equivalent circuit techniques and head design. Medium noise mechanisms; S/N ratios and system error rate analysis. Three hours of lecture. *Prerequisite: ECE 107 with a grade of C– or better.* (W) N. Bertram

147. Magnetic Recording Laboratory (4)
Measurements and analysis of frequency dependence of recording head permeability, inductance, and efficiency. Field plotting and Fourier transforms of head fields. Recording spectra and pulse measurements and media characterization using current recording systems. One hour of lecture, seven hours of laboratory. *Prerequisite: ECE 146 with a grade of C– or better.* (S) N. Bertram

151. Probability and Statistics in Engineering (4)
Axioms of probability, conditional probability, theorem of total probability, random variable, densities, expected values, characteristic functions, transformation of random variables central limit theorem. Random number generation, elements of estimation, random sampling, sampling distributions, test for hypothesis. Four hours of lecture. *Prerequisites: Grades of C– or better in Math. 20A-B-C-D-F, CSE 20.* (Students who have taken ECE 109 may not take ECE 151 for credit.) (S) Staff

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. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 109 with a grade of C– or better.* (S) R. Rao

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. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 153 with a grade of C– or better.* (F) L. Milstein

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. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 154A with a grade of C– or better.* (W) L. Milstein

154C. Communications Systems III (4)
Introduction to information theory and coding, including entropy, average mutual information, channel capacity, block codes and convolutional codes. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 154B with a grade of C– or better.* (S) L. Milstein

155A. Communications Systems Laboratory (4)
This course will be concerned with modulation and coding techniques for digital recording channels. Three hours of lecture. *Prerequisites: ECE 109 and 153 with grades of C– or better and concurrent registration in ECE 154A required. Department stamp required.* (F) J. Wolf

155B-C. Communications Systems Laboratory (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 compiler simulations. One hour lecture, four hours of laboratory. *Prerequisites: ECE 109 and 153 with grades of C– or better and concurrent registration in ECE 154B-C required. Department stamp required.* (W,S) J. Wolf

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. Three hours of lecture, three hours of laboratory. *Prerequisite: ECE 109 with a grade of C– or better.* (W) R. Rao

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. Three hours of lecture, three hours of laboratory. *Prerequisite: ECE 158A with a grade of C– or better.* (S) R. Cruz

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. Three hours of lecture. *Prerequisite: ECE 109 with a grade of C– or better.* (F) E. Masry

159B. Queuing Systems: Computer Systems Performance (4)
Computer systems applications; priority scheduling, time-sharing scheduling, modeling and performance of interactive multipro-grammed computer systems, a case study. Three hours of lecture. *Prerequisite: ECE 159A with a grade of C– or better.* (W) E. Masry

159C. Queuing Systems: Networks & Operation Research Applications (4)
Elements of computer-communication networks; delay analysis, capacity and flow assignments. Operation research applications, cost models and optimization, a case study, introduction to inventory systems. Three hours of lecture. *Prerequisite: ECE 159B with a grade of C– or better.* (S) E. Masry

162A. Digital Signal Processing I (4)
Design of linear filters in discrete time, including IIR, FIR, and frequency domain filters. Coefficient transformations. Discrete Fourier Transform algorithms and their properties. Digital signal processing structures and implementations. Quantization effects. Algorithms simulated by computer and tested in the laboratory. Three hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisite: ECE 101 with a grade of C– or better.* (S) Staff

162B. Digital Signal Processing II (4)
Basic principles of adaptive algorithms. Algorithms for adaptive FIR (gradient, LMS, recursive techniques) and adaptive IIR filtering. Implementation issues. Introduction to fast transform algorithms (FFT, Winograd FFT, number theoric transforms, DCT). Fast convolution and correlation. Algorithms simulated by MATLAB. Three hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisite: ECE 162A with a grade of C– or better.* (S) P. Chau

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. Three hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisites: ECE 101 and 102 with grades of C– or better.* (S) W. Coles

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. Three hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisite: ECE 102 with a grade of C– or better. ECE 163 recommended.* (F) Staff

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.) Three hours of lecture, one hour of discussion, three hours of laboratory. *Prerequisite: ECE 108 with a grade of C– or better.* (W) P. Chau

166. Microwave Systems and Circuits (4)
Waves, distributed circuits and scattering matrixmethods. 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. Three hours of lecture, one hour of discussion, three hours of

laboratory. *Prerequisites: ECE 102 and 107 with grades of C– or better.* (S) P. Asbeck

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. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 60B or ECE 53-54 or Ames 163B with a grade of C– or better.* (S) D. Sworder

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. Three hours of lecture, one hour of discussion. *Prerequisite: ECE 171A with a grade of C– or better.* (F) D. Sworder

172A. Introduction to Intelligent Systems: Robotics and Machine Intelligence (4)
This course will introduce basic concepts in robotics and machine intelligence. In this course, we will cover basic concepts in machine perception and integrated systems. Topics covered will be: edge detection, segmentation, dynamic systems and object recognition. Three hours of lecture, one hour of discussion. *Prerequisite: CSE 10 or 11 with a grade of C– or better.* (F) R. Jain

172B. Introduction to Intelligent Systems: Robotics and Machine Intelligence (4)
The second half will be concerned with techniques in machine intelligence, control theory, and robotics. Topics covered will include: problem solving, search, robot planning, and robot control. Three hours of lecture, one hour discussion. *Prerequisite: ECE 172A with grade of C– or better.* (W) R. Jain

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. Four hours of lecture. *Prerequisite: Math. 20F with a grade of C– or better.* (S) A. Sebald

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. Four hours of lecture. *Prerequisite: Math. 20F with a grade of C– or better.* (S) B. Rao

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. Four hours of lecture. *Prerequisites: ECE 109 and ECE 174 with grades of C– or better.* (W) K. Kreutz-Delgado

178. Visual Information Management Systems (4)
Requirements of image and video information systems, data models, visual query environment, similarity methods, indexing techniques, features and primitives for describing visual information, visualization in databases. Three hours of lecture, one hour of discussion. *Prerequisites: CSE 12, ECE 78, and ECE 172A.* (S) R. Jain

181. Geometrical Optics and Guided-wave Optics (4)
Electromagnetic optics, reflection, refraction, and stratified media. Geometrical optics, ray tracing, aberrations, optical elements, and optical system design. Optical instruments, photometry, radiometry, and interferometers. Resonators, guided-wave and fiber optics. Labs: ray tracing, interferometry, guided-wave and fiberoptics. Three hours of lecture, two hours of demonstration laboratory. *Prerequisites: ECE 103 and 107 with grades of C– or better.* (S) C. Guest

182. Physical Optics and Fourier Optics (4)
Diffraction: Kirchoff, Fraunhofer, and Fresnel. Fourier and Fresnel Transform optics and optical information processing. Holography, Gaussian beams, coherence, statistical optics and photon optics. Polarization and crystal optics. Labs: difraction, Fourier and Fresnel Transforms, coherence. Three hours of lecture, two hours of demonstration laboratory. *Prerequisites: ECE 103 and 107 with grades of C– or better.* (F) S. Lee and S. Fainman

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. Three hours of lecture, two hours of demonstration laboratory. *Prerequisites: ECE 103 and 107 with grades of C– or better.* (W) C. Tu

184. Optical Information Processing and Holography (4)
Labs: optical holography, photorefractive effect, spatial filtering, computer generated holography. Two and a half hours of lecture, four hours of laboratory. *Prerequisite: ECE 182 with a grade of C– or better.* (W) S. Fainman and S. Lee

185. Lasers and Modulators (4)
Labs: CO2 laser, HeNe laser, electrooptic modulation, acoustooptic modulation, spatial light modulators. Two and a half hours of lecture, four hours of laboratory. *Prerequisite: ECE 183 with a grade of C– or better.* (S) S. Lee and S. Fainman

186. Introduction to Robotic Vision (4)
Visual perception, imaging geometry, camera model and calibration. Image processing fundamentals: image transforms, image enhancement using spatial- and frequency-domain methods, filtering and restoration. Introduction to photometric stereo, motion fields, and elements of pattern classification. Three hours of lecture, four hours laboratory. *Prerequisite: ECE 101 with a grade of C– or better.* (S) S. Fainman

190. Design Tools and Procedures (4)
Electrical and computer engineering design. Use of computer and development tools in the design process. Participation in and management of design performed by groups of engineers. Several short duration group design projects are completed. Three hours of lecture, four hours laboratory. *Prerequisites: ECE 102 and ECE 108 with grades of C– or better or sponsorship of a faculty member.* (F) C. Guest

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. Two hours of discussion, eight hours of laboratory. *Prerequisites: Completion of all of the breadth courses and one depth course.* (W) C. Guest

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)
An advanced reading or research project performed under the direction of an ECE faculty member. Must be taken for a letter grade. *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.) Three hours of lecture. *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

220. Space Plasma Physics (4)
The nature of the solar wind interaction with different planets and comets leads to a variety of magnetospheres. This course will deal with both nature of the solar wind as well as these interactions. Three hours of lecture. *Prerequisite: ECE 107 or equivalent or consent of instructor.* (W) A. Mendis

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, waveguides, optical fibers, and resonant structures. Radiation, propagation, and scattering problems. Scattering matrices, microwave circuits, and antennas. Three hours of lecture. *Prerequisites: ECE 107, 123, 124 or equivalent.* (F,W,S) B. Rickett

224A,B. Wave Propagation through Random Media (4)
Theory of scintillations due to refractive-index fluctuations at radio wavelengths in the solar wind, the ionosphere, and the interplanetary medium, and at optical wavelengths in the earth's atmosphere. Connection between the refractive index spectrum, the angular spectrum, and the intensity spectrum. Three hours of lecture. *Prerequisite: consent of instructor.* (W,S) W. Coles

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. Three hours of lecture. *Prerequisites: fundamentals of quantum mechanics, ECE 135A-B, or equivalent.* (F) S.S. Lau

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. Three hours of lecture. *Prerequisite: ECE 230A.* (W) P. Asbeck

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. Three hours of lecture. *Prerequisite: ECE 230A or equivalent.* (S) P. Yu

230D. Characterization of Electronic Devices (4)
Characterization of the electrical and galvanomagnetic properties of semiconductors relevant to the technology of transistors and integrated circuits. Three hours of lecture. *Prerequisite: consent of instructor.* (F) H. Wieder

230E. Introduction to Superconductivity (4)
Superconductivity phenomenon, two-fluid models and phenomenological theories, magnetic properties of ideal superconductors, type II superconductors, tunneling, microscopic theory, superconducting materials, current developments. Three hours of lecture. *Prerequisite: consent of instructor.* (F) H-L. Luo

231. Thin Film Phenomena (4)
This course is designed to provide a general survey of thin film processes pertinent to microelectronics. Topics to be discussed include preparation methods, various modern analytical techniques, physical properties, growth morphology, interface reaction, and alloy formation and applications. Three hours of lecture. *Prerequisite: consent of instructor.* (W) S.S. Lau and H-L.Luo

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. Three hours of lecture. *Prerequisite: consent of instructor.* (S) H. Wieder

233. Structure of Solids (4)
Atomic structure, properties and growth of ordered and disordered solids. Laboratory work includes generation of X-ray spectra, symmetry determination by Laue-technique, structure determination by single crystal and power techniques, electron diffraction, and radial distribution analysis. (W) G. Arrhenius

235. Transmission Electron Microscopy (4)
Lectures and laboratory experience giving an introduction to transmission electron microscopy (TEM) for materials science. The course will cover the basic theory of electron optics, kinematical and dynamical diffraction, and image contrast, and will include instruction on the operation and calibration of the TEM and techniques for specimen preparation. Multiple listing with Materials Science 240D. Three hours of lecture. *Prerequisite: consent of instructor.* (W) K. Kavanagh and M. L. Rudee

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. Three hours of lecture. *Prerequisites: ECE 230A-B-C or consent of instructor.* (F) C. Tu

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. Three hours of lecture. *Prerequisites: ECE 230A and 230C or equivalent.* (W) P. Yu

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. Three hours of lecture. *Prerequisite: consent of instructor.* (S) H. Wieder

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. Three hours of lecture. *Prerequisite: consent of instructor.* (F) P. Asbeck

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. Three hours of lecture. *Prerequisite: consent of instructor.* (F) K. Kavanagh

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. Three hours of lecture. *Prerequisite: consent of instructor.* (F) K. Kavanagh

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. Three hours of lecture. *Prerequisite: ECE 238A.* (W) K. Kavanagh

239. Nanometer-Scale Probes and Devices (4)
Discussion of scanning tunneling microscopy, atomic force microscopy, and other high-resolution scanning probe techniques, including basic concepts, experimental considerations, and applications. Fabrication and properties of submicron structures, with emphasis on the study of semiconductor materials and devices. Three hours of lecture. *Prerequisite: consent of instructor.* (F) Edward T. Yu

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. Three hours of lecture. *Prerequisites: ECE 123, 124 or equivalent; introductory quantum mechanics or ECE183.* (F) W. Chang

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. Three hours of lecture. *Prerequisite: ECE 182 or equivalent.* (W) S. Lee and S. Fainman

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. Three hours of lecture. *Prerequisites: ECE 181, 183 or equivalent.* (S) S. Esener and P. Yu

241A. Nonlinear Optics (4)
Second harmonic generation (color conversion), parametric amplification and oscillation, photorefractive effects and four-wave mixing, optical bistability; applications. Three hours of lecture. *Prerequisites: ECE 240A, C, or consent of instructor.* (F) S.Fainman and S. Lee

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. Three hours of lecture. *Prerequisites: ECE 240A, C, or consent of instructor.* (F) S. Esener

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. Three hours of lecture. *Prerequisite: ECE 182 or equivalent, or consent of instructor.* (W) S. Fainman

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) S. Lee and S. Fainman

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) S. Lee and S. Fainman

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 wave guide properties. Characterization of Hughes LCLV spatial light modulator. *Prerequisites: ECE 181, 182, 183, or consent of instructor.* Staff

242A. Optical Systems (4)
Principles of optical system design. Modeling of optical and opto-electronic components, modules, and systems. Signal integrity analysis. Design optimization using CAD. Assembly and testing. System scalability and manufacturability. Opto-electronic packaging. Three hours of lecture. *Prerequisites: ECE 240A-B-C, or consent of instructor.* (W) S. Lee

242B. Optical Systems (4)
Principles of optical system design. Modeling of optical and opto-electronic components, modules, and systems. Signal integrity analysis. Design optimization using CAD. Assembly and testing. System scalability and manufacturability. Opto-electronic packaging. Three hours of lecture. *Prerequisites: ECE 240A-B-C, or consent of instructor.* (S) S. Lee

243A. Optical Fiber Communication (4)
Optical fibers, waveguides, laser communication system. Modulation and demodulation; detection processes and communication receivers. Three hours of lecture. *Prerequisites: ECE 107, 123, 124, or equivalent: introduction to communication.* (W) W. Chang and P. Yu

245A. Advanced Acoustics I (4)
Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustical transducers. Three hours of lecture. *Prerequisite: concurrent registration in ECE 145AL recommended.* (F) J. Hildebrand

245B. Advanced Acoustics II (4)
Theory of radiation transmission and scattering of sound with special application to ocean acoustics. Three hours of lecture. *Prerequisite: ECE 245A or consent of instructor. Concurrent registration in ECE 145BL recommended.* (W) J. Hildebrand

245C. Advanced Acoustics III (4)
Signal processing in underwater acoustics. Theory and hardwave embodiments. Three hours of lecture. *Prerequisite: ECE 245B or consent of instructor. Concurrent registration in ECE 145CL recommended.* (S) J. Hildebrand

246A. Physics of Magnetic Recording Materials (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) N. Bertram

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) N. Bertram

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) N. Bertram

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) R. Lugannani

251A. Digital Signal Processing I (4)
Sampling theorem: A/D and D/A conversion; discrete linear system theory, z-transforms; digital filters, recursive and nonrecursive designs; fast Fourier transform, windowing, high-speed correlation and convolution; cepstrum analysis and homomorphic deconvolution. *Prerequisites: ECE 109, 153 or equivalent.* (F) W. Hodgkiss and B. Rao

251B. Digital Signal Processing II (4)
Discrete random signals; finite word length effects; conventional (FFT-based) spectral estimation; coherence and transfer function estimation; model-based spectral estimation; applications. *Prerequisite: ECE 251A or consent of instructor.* (W) W. Hodgkiss and B. Rao

251C. Digital Signal Processing III (4)
Single and multichannel data processing in a time-varying environment; phase locked loops; Kalman filters; adaptive transversal and lattice filters; time-evolving, high-resolution spectral estimation; adaptive beamforming. *Prerequisite: ECE 251B or consent of instructor.* (S) W. Hodgkiss and B. Rao

251D. Digital Signal Processing IV (4)
Adaptive transversal and recursive least squares lattice algorithms, performance analysis of adaptive signal processing algorithms for channel equalization, interference suppression, and other applications, implementation of adaptive algorithms in DSP hardware, blind deconvolution. *Prerequisite: ECE 251C or consent of instructor.* (F) J. Zeidler

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 251A or ECE 162A.* (W) B. Rao

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) B. Rao

253A. Fundamentals of Digital Image Processing (4)
Image formation, models, quantization and sampling, 2-D random fields, image transforms, compression and coding, image enhancement, edge detection, morphology. *Prerequisites: ECE 109, 153, ECE 162A-B and ECE 251A recommended.* (W) P. Cosman

253B. Digital Image Analysis (4)
Fundamentals of computer vision, scene segmentation, texture analysis, 3-D shape extraction from monocular and stereo images, feature analysis and cue fusion, analysis of time-varying images, understanding of range and structured light images. *Prerequisite: ECE 253A or consent of instructor.* (S) P. Cosman

253C. Digital Image Restoration and Reconstruction (4)
Theory and algorithms: deconvolution, additive and signal-dependent noise removal, band limited extra polation, 2-D and 3-D reconstruction from full projections and limited view. Applications in remote sensing, electromagnetics, sonar, and medical imaging. *Prerequisites: ECE 253A recommended; ECE 176A-B.* (S) Staff

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) R. Lugannani

256A-B. Time Series Analysis and Applications (4-4)
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 250.* (W,S) E. Masry

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) R. Rao

257B. Multiuser Communication Systems (4)
Markovian networks, Jackson's theorem. Communication networks. Topological design. Flow control: prevention of deadlock and throughput degradation. Delay, throughput power. Routing local global information, centralized, decentralized schemes, static, dynamic algorithms. Shortest path and minimum average delay algorithms. Comparisons. *Prerequisite: ECE 257A.* (S) R. Rao

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 254A or consent of instructor.* (W,S) L. Milstein

259A. Information Theory (4)
Introduction to basic concepts, source coding theorems, capacity, noisy-channel coding theorem. *Prerequisites: ECE 154A-B-C or consent of instructor.* (F) L. Milstein

259B. Algebraic Coding (4)
Fundamentals of block codes, bounds, introduction to groups, rings and finite fields, nonbinary codes, cyclic codes such as BCH and RS codes, decoding algorithms, applications. (W) J. Wolf

259C. Coding for Digital Communication (4)
Coding theory developed from the viewpoint of digital communications engineering, characterization of basic channel models, block and convolutional coding error bounds, maximum-likelihood and sequential decoding, trellis coding and decoding for both wideband and bandlimited channels. *Prerequisites: ECE 154A-B-C or consent of instructor.* (S) Staff

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. Three hours of lecture. *Prerequisites: undergraduate-level semiconductor electronics and digital system design; ECE 165 or equivalent or consent of instructor.* (F) Paul M. Chau

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. Three hours of lecture. *Prerequisite: ECE 260A.* (W) P. Chau

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. Three hours of lecture. *Prerequisite: ECE 260B.* (S) Pau M. Chau

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. Three hours of lecture. *Prerequisite: consent of instructor.* (W) W. Ku

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. Three hours of lecture. *Prerequisite: consent of instructor.* (S) W. Ku

262A. RPG of ASICS (Rapid Prototyping and Generation of Application-Specific Integrated Circuits and Systems) (4)
Rapid prototyping and generation (RPG) of very large scale integration (VLSI) application-specific integrated circuits and systems (ASICS). Formal methodology in top-down systems design with hands-on experimental application of new fast implementation techniques to real-world projects. Utilization of state-of-the-art commercial CAS software which provides for VHSIC hardware description language (VHDL), logic synthesis, and technology independent mapping to most ASIC and FPGA (field programmable gate array) vendors. Five hours of lecture, nine hours of laboratory. *Prerequisites: ECE 164, 165, 166, and 81.* (W) P. Chau

262B. RPG of ASSPS (Rapid Prototyping and Generation of Applications-Specific Signal Processing Systems) (4)
Introduction to concurrent engineering which can only be effectively treated through the employment of a multiprocessing environment. Strategies for partitioning of signal processing system designs and optimization of scheduling of task assignments in a distributed computing environment. Introduction to mixed-signal systems and reduced complexity system design. Testing of rapid prototyped ASICS. Three hours of lecture, nine hours of laboratory. *Prerequisite: ECE 262A.* (S) P.Chau

263A. Reliable Design of Digital Systems (4)
Fault tolerance and testability have the common objective of improving the reliability of computer hardware. Knowing the fault models, how faults manifest themselves, how to test fault existence, and how to keep system functioning when fault exists help the engineers choose different techniques in computing and VLSI systems designs. *Prerequisite: ECE 263A or consent of instructor.* (F) T. T. Lin

263B. Fault-Tolerant Computing and VLSI Testing I (4)
This course will cover all aspects of fault-tolerant computing and VLSI testing. Topics include fundamental concepts of fault-tolerant hardware design, test pattern generation, signature analysis, system diagnosis and evaluation, and fault tolerance in VLSI-based systems. *Prerequisite: ECE 263A or consent of instructor.* (W) T. T. Lin

263C. Fault-Tolerant Computing and VLSI Testing II (4)
Fault tolerance and testability have the common objective of improving system reliability. The second part of the course emphasizes systemwide design issues. Topics include fault-tolerant architecture and systems, design for testability, and computer-aided reliability evaluation. Current research issues in fault-tolerant computing and VLSI testing will be addressed. *Prerequisites: ECE 263A-B or consent of instructor.* (S) T. T. Lin

270A-B-C. Neurocomputing (4-4-4)
Neurocomputing is the study of nonalgorithmic information processing. This three-quarter sequence covers neurocomputing theory, design, and application, including sensor processing, knowledge processing, data analysis, and hands-on training with a neurocomputer. *Prerequisite: graduate standing in ECE or CSE, or consent of instructor.* (F,W,S) R. Hecht-Nielsen

271A-B-C. Linear and Nonlinear Systems (4-4-4)
Linear algebra, linear vector spaces, matrix functions, linear differential equations, state transition matrix, stability theory, controllability, observability, realization theory, pole placement, observers, singularly perturbed systems, contraction maps, nonlinear differential equations, linearization, Liapunov and Popov stability, describing functions. *Prerequisites: ECE 171A and 174.* (F,W,S) K. Kreutz Delgado

272A-B. Stochastic Processes in Dynamic Systems (4-4)
Diffusion equations, linear and nonlinear estimation and detection, random fields, optimization of stochastic dynamic systems, applications of stochastic optimization to problems. *Prerequisites: ECE 250; ECE 272B requires 272A.* (W,S) D. Sworder

273A-B-C. Optimization in Linear Vector Spaces (4-4-4)
Hilbert spaces, Banach spaces, projection theorem, dual spaces, Hahn Banach theorem, hyperplanes, geometric form of H Banach theorem, modern statistical optimization routines (simulated annealing, evolutionary programming), approaches to large neural net problems derived from the physics literature (chaos, spin glass, basic statistical mechanics). *Prerequisites: ECE 174. ECE 273B requires 273A and 273C requires 273B.* (F,W,S) A. Sebald

274A. System Identification (4)
Model types for system identification (transfer function, state space, ma, arma, armax, Box-Jenkins, etc). Convergence and consistency (identifiability, asymptotic distribution of parameter estimates). Recursive methods, experimental design (sufficient excitation, pre-treatment of data, etc). Modern methods (simulated annealing and evolutionary programming). *Prerequisite: ECE 275.* (W) A. Sebald

274B. System Identification (4)
Adaptive control (integrating real-time system identification and control), basics of intelligent control (fuzzy control, evolutionary programming and control). Basics of neural net controllers. *Prerequisite: ECE 274A.* (S) A. Sebald

275. Parameter Estimation (4)
Least squares, bias, efficiency, consistency, tolerance intervals, hypothesis tests and other forms of figures of merit for practical estimation, Practical issues in L squares estimation (multicollinearity, heteroskedasticity), MMSE, maximum likelihood and MAP estimation, projection lemma in Hilbert space, numerical aspects, including QR and householder transformations, singular value decompositions and pseudoinverse. *Prerequisites: ECE 109, 153 and ECE 271A (may be taken concurrently).* (F) A. Sebald

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. Three hours of lecture. *Prerequisites: ECE 171A, 171B, ECE 174 must be completed with grades of C– or better. (ECE 174 may be concurrent.)* (W-S) K. Kreutz-Delgado

277. Image Computing (4)
Image representation, basic image analysis algorithms, and basic visualization algorithms will be presented. Role of data models, data models for image and video data, and other related topics from database systems will be introduced. Students will implement a system for a specific application to use the concepts learned in this course. *Prerequisites: experience equivalent to CSE 12, 100 (Data Structures) is recommended, and experience with C or C+ +.* R. Jain

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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

281. Special Topics in Radio and Space Science (4)
A course to be given at the discretion of the faculty at which topics of interest in radio and space 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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

287A,B,C. 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. Three hours of lecture. *Prerequisite: consent of instructor.* Staff

288. Special Topics in Applied Physics (1-8)
A course to be given at the discretion of the faculty at which topics of current interest in applied physics will be presented by visiting or resident faculty members. (S/U grades optional.) *Prerequisite: consent of instructor.* Staff

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. Staff

292. Graduate Seminar in Radio and Space Science (2)
Research topics in radio astronomy, space plasmas, and solar system physics. (S/U grades only.) B. Rickett

293. Graduate Seminar in Communication Theory and Systems (2)
Weekly discussion of current research literature. Staff

294. Graduate Seminar in Applied Solid State Physics (2)
Research topics in applied solid state physics and quantum electronics. H-L. Luo

295. Graduate Seminar in Computer Engineering (2)
Biweekly discussion of research topics in computer engineering. Computer engineering is currently the most impacted field both in industry and academia. Computer engineering is the science of searching for an optimum within constraints of available methods and resources. Three hours of seminar. *Prerequisite: consent of instructor.* (F,W,S) T. T. Lin

296. Graduate Seminar in Optical Signal Processing (2)
Research topics of current interest in holography. S. Lee

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.*

English as a Second Language

Office: 3231 Literature Building, Warren College

Director

Margaret Loken, M.A.

The English as a Second Language Program offers two writing courses for any interested non-native speakers, one writing course for non-native-speaking graduate students, and one seminar course for teaching assistants in the program.

ESL Writing is a requirement for all undergraduates who have not satisfied the Subject A requirement and who have been designated ESL based on the Subject A Proficiency Test. Students must earn a grade of C or better to pass from the program to Subject A. Those earning a B or better will be recommended to take the Subject A exit exam, with the possibility of going on to their college writing program should they pass. The course may be repeated once for credit, a second time for workload credit.

ESL Writing Workshop and ESL Writing for Graduate Students are offered for workload credit only and may be repeated.

COURSES

10. 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. *Prerequisite: A department stamp is required.*

11. Writing Workshop (2)
This course is offered to students currently enrolled in ESL 10 who need additional help with their writing. The course will include class discussion and individualized instruction, and will address students' grammar and syntax needs. *Prerequisite: A department stamp is required.*

20. 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 will deal with common rhetorical and grammatical issues but will work on writing tasks for their respective disciplines. Workload credit only. May be repeated. *Prerequisite: A department stamp is required.*

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. *Prerequisite: A department stamp is required.*

Environmental Studies

OFFICE: 2024 Humanities and Social Sciences Building, Muir College, (619) 534-3589

Faculty

Georgios Anagnostopoulos, Ph.D., *Professor, Philosophy*
Rae Blumberg, Ph.D., *Professor, Sociology*
Richard Carson, Ph.D., *Associate Professor, Economics*
Pau Chau, Ph.D, *Associate Professor, AMES*
Susan Davis, Ph.D., *Associate Professor, Communication*
Patrick Ledden, Ph.D., *Provost, Muir College*
Gordon MacDonald, Ph.D., *Professor, IRPS; Research Director, IGCC*
James Moore, *Ph.D., Associate Professor, Anthropology*
Keith Pezzoli, Ph.D., *Director/Field Studies, Urban Studies and Planning*
Fitz John P. Poole, Ph.D., *Associate Professor, Anthropology*
Shirley Strum, Ph.D., *Professor, Anthropology*
Mark Thiemens, Ph.D., *Professor, Chemistry*
David Woodruff, Ph.D., *Professor, Biology*

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 (noted with a # sign), 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 of available courses, please come to the Environmental Studies Office: Muir Interdisciplinary Studies, 2024 HSS, mail code 0106, phone (619) 534-3589.
The minor is structured as follows:

Required:
Environmental Studies 30A, usually offered in the fall quarter
Environmental Studies 30B, usually offered in the spring quarter (need not be taken consecutively)

Required:

Four additional courses, at least three 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

AMES 119B. Energy: Non-Nuclear Energy Technologies
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 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 40. Earth Sciences and the Environment
Environmental Studies 102. Selected Topics in Environmental Studies (when taught from a natural sciences perspective)
Science, Technology, Public Affairs 35: Society and the Sea

Group B—Social Sciences/ Humanities

Anthropology GN 100. Origins of Agriculture and Sedentism
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 105. History of Environmentalism
History US 137. The Built Environment in the Twentieth Century
History US 154. Western Environmental History (cross-listed with USP 160)
†IRPS GN 458. International Environmental Policy
†IRPS GN 459. Conflict Resolution of Environmental Issues
#Literature EN 147. Metamorphoses of the Symbol
#Literature GN 160. Specialized Genres in Literature
†#Literature WR 127. General Nonfiction Prose Workshop
Philosophy 186. Technology and Human Values
Sociology D 184. Societal Evolution and Economic Development
#Sociology D 185. The Political Economy of Development and Underdevelopment
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 170. Planning Theory and Practice
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.

†Instructor's approval required for enrollment.

COURSES

30A. 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.*

30B. 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: 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.*

Ethnic Studies

OFFICE: Social Science Building, Rm. 201

Faculty

Charles Briggs, Ph.D., *Professor*
Paule Cruz Takash, Ph.D., *Assistant Professor*
Yen Le Espiritu, Ph.D., *Associate Professor*
Ross Frank, Ph.D., *Assistant Professor*
Ramon A. Gutierrez, Ph.D., *Chancellor's Associates Endowed Chair, Professor and Department Chair*
Jonathan Holloway, Ph.D., *Assistant Professor*
George Lipsitz, Ph.D., *Professor*
Jane Rhodes, Ph.D., *Assistant Professor*
Leland Saito, Ph.D., *Assistant Professor*

Associated Faculty

James Cheatham, *Emeritus, Music*
Matthew Chen, *Linguistics*
Steve Cornell, *Sociology*
Anthony Curiel, *Theatre*
Steve Erie, *Political Science*
Claudio Fenner-Lopez, *Emeritus, Communication/Visual Arts*

Floyd Gaffney, *Theatre*
Harry Hirsch, *Political Science*
Jorge Huerta, *Theatre*
Arend Lijphardt, *Emeritus, Political Science*
James Lin, *Mathematics*
Lisa Lowe, *Literature*
Cecil Lytle, *Music*
George Mariscal, *Literature*
Masao Miyoshi, *Literature*
Vicente Rafael, *Communication*
Edward Reynolds, *History*
Ramon Eduardo Ruiz, *Emeritus, History*
Marta Sanchez, *Literature*
Rosaura Sanchez, *Literature*
Faustina Solis, *Emeritus, Urban Studies/ Community and Family Medicine*
Ricardo Stanton-Salazar, *Sociology*
Olga Vasquez, *Communication*
Sherley Anne Williams, *Literature*

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 intragroup 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 102: Racial Inequality in America
      ETHN 103: American Culture and Ethnic dentity
      ETHN 104: The Idea of Race in America
      ETHN 105: Ethnic Diversity and the City
      ETHN 106: Ethnoracial Transformations of U.S. Communities
      ETHN 107: Ethnogrpahic Field Work in Racial and Ethnic Communities
      ETHN 112: History of Native Americans in the United States
      ETHN 115: The Sociology of Indian-White Relations
      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 130: Social and Economic History of the Southwest I
      ETHN 131: Social and Economic History of the Southwest II
      ETHN 150: Politics of Cultural Pluralism and National Integration
      ETHN 151: Ethnic Politics in America
      ETHN 152: Law and Civil Rights
      ETHN 155: The Supreme Court and the Constitution
      ETHN 156: Civil Liberties–The Rights of Criminals and Minorities
      ETHN 157: Ethnic Conflict in the Third World
      ETHN 158: Immigration Policy and Politics
      ETHN 160: Black Politics and Protests in the Early 20th Century (1895–1941)
      ETHN 161: Black Politics and Protest Since World War II
      ETHN 162: Cultural Contact and Exchange
      ETHN 163: Leisure in Urban America
      ETHN 169: African Society and the Slave Trade
      ETHN 170: Slavery and the Atlantic World
      ETHN 171: Slavery and Freedom in the Nineteenth-Century United States

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: American Slave Communities in Comparative Perspective

ETHN 182: Segregation, Freedom Movements, and the Crisis of the Twentieth Century

ETHN 183: Gender, Race, Ethnicity, and Class

ETHN 184: Black Intellectuals in the Twentieth Century

ETHN 189: Special Topics in Ethnic Studies

C. At least three upper-division courses that focus on language and ethnicity:

ETHN 140: Language and American Ethnicity

ETHN 141: Language and Culture

ETHN 145: Spanish Language in the United States

ETHN 185: Discourse, Power and Inequality

Due to the limited course offerings in this general area during the 1995–96 academic year, this requirement may be fulfilled by taking either three upper-division courses in language (e.g., Chinese, Vietnamese, Spanish, etc.) or area studies (e.g., Latin American studies, Third World studies, Japanese studies, etc.), or some combination of language and area studies. Students must seek faculty advice on which three upper-division courses would best satisfy this 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 132: Chicano Dramatic Literature

ETHN 133: Hispanic-American Dramatic Literature

ETHN 134: The Chicana

ETHN 135: Development of Chicano Literature

ETHN 136: Themes and Motifs in Chicano Literature

ETHN 137: Chicano Prose

ETHN 138: Chicano Poetry

ETHN 139: Chicano Literature in English

ETHN 144: Colonialism and Culture

ETHN 146A: Theatrical Ensemble

ETHN 168: Comparative Ethnic Literature

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 177: African Heritage in Contemporary Drama: African, Caribbean, and African American

ETHN 178: Introduction to Oral Music

ETHN 179A-B: Music of African Americans

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.

The Minor

Students may minor in ethnic studies. Students wishing to minor in ethnic studies must take six four-unit upper-division courses from the department's offerings. The department offers several options that allow students to take courses about a variety of ethnic groups or about one group. But all students minoring in ethnic studies must enroll in our two 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.) The minor also requires that at least two, but no more than three of the four remaining courses be selected from either the ethnic studies history and social studies courses (listed above as 2B), or the ethnic studies literature and cultural expressions courses (listed above as 2D.) While the language and ethnicity courses currently offered may also be used to satisfy this requirement, foreign language and area studies courses from other departments may not.

Students interested in the African-American experience should consider the following courses:

ETHN 160: Black Politics and Protests in the Early 20th Century (1895–1941)

ETHN 161: Black Politics and Protest Since World War II

ETHN 169: African Society and the Slave Trade

ETHN 170: Slavery in the Atlantic World

ETHN 171: Slavery and Freedom in Nineteenth Century United States

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 177: African Heritage in Contemporary Drama: African, Caribbean, and African American

ETHN 179A-B: Music of African Americans

ETHN 181: American Slave Communities in Comparative Perspective

ETHN 182: Segregation, Freedom Movements, and the Crisis of the Twentieth Century

ETHN 184: Black Intellectuals in the Twentieth Century

LTEN 188: Contemporary Caribbean Literature

THHS 153: Dance History: Jazz Dance and Related Ethnic Studies

Students interested in the Chicano Experience should consider the following courses:

ETHN 132: Chicano Dramatic Literature

ETHN 133: Hispanic-American Dramatic Literature

ETHN 134: The Chicana

ETHN 135: The Development of Chicano Literature

ETHN 136: Themes and Motifs in Chicano Literature

ETHN 137: Chicano Prose

ETHN 138: Chicano Poetry

ETHN 139: Chicano Literature in English

ETHN 145: Spanish Language in the United States

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

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 112: History of Native Americans in the United States

ETHN 115: 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, 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 methodology and theory, the history of ethnic studies, and controversies in ethnic studies.
2. **Ethnic Studies 210A-B, Research Seminar**
   During the first and second year of graduate study, all students will be required to take two (2) two-quarter research seminars, (four units each, sixteen units total). Research seminars teach students to design and execute research on areas of focused research within ethnic studies. Objects of study will vary as the course is taught by different instructors.
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, Disciplinary Methods**
   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; Advanced Theories and Methods of 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 winter and spring quarters of the second year of graduate studies.

6. **Ethnic Studies 295A-B-C, Dissertation Seminar**
   By the end of their fourth year, all candidates for the Ph.D. degree must take Ethnic Studies 295A-B-C, the Dissertation Seminar. This is a three-quarter seminar about all phases of dissertation research and writing. Students will begin their dissertations while taking this seminar.

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 Commitee 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 Ph.D. candidates must take Ethnic Studies 295A-B-C by the end of their fourth year.

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.

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.

102. Racial Inequality in America: A Comparative Historical Analysis (4)
This course will examine slavery, segregation, conquest, discrimination, and exploitation as social and cultural institutions shaping contemporary life in America. The origins and implications of inequality will be explored through analysis and interpretation of primary and secondary sources.

103. American Culture and Ethnic Identity (4)
This course examines how the ethnic experience in the United States has been represented, mediated, and shaped by expressive cultural forms including literature, folklore, visual art, and mass media.

104. The Idea of Race in America (4)
This course will examine the intellectual history of race as a concept in American culture, surveying the origins and evolution of both racist and antiracist theories and beliefs.

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.

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. Ethnographic Field Work in Racial and Ethnic Communities (4)
This is a research methods course examining social, economic, and political issues in ethnic and racial communities through ethnographic field work that places the researcher directly into the social world under study. Topics are examined through field work and library research. (Cross-listed with USP 130.)

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.

112. History of Native Americans in the United States (4)
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.

115. The Sociology of Indian-White Relations (4)
Students will examine historical and contemporary relations between Native American societies and the United States, paying particular attention to transformation in Indian collective identities, political power, and collective action, and to current political and economic issues. (Cross-listed with SOCD 181i.)

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.

120. Comparative Asian-American History 1850–1965 (4)
Using comparative methods of analysis, this course will examine the historical experience of Asian-Americans in areas such as immigration, settlement patterns, labor, economic development, race relations, community institutions, and occupational patterns between 1850 and 1965.

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.)

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 actos, 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. The Chicana (4)
A critical study of gender, ethnicity, class, and national origin as it pertains to the Chicana. The course will have a historical focus and examine literary and social science texts written by Chicana/o and non-Chicano writers.

135. Development of Chicano Literature (4)
A cross-genre survey of major works in Chicano literature from its beginning to the present with primary emphasis on contemporary works. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 150.)

136. Themes and Motifs in Chicano Literature (4)
This course is organized around some of the significant themes and ideas expressed in specific Chicano writings. The importance of these themes to particular Chicano experience is considered. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 151.)

137. Chicano Prose (4)
A study of the different genres of Chicano prose: novel, short story, poetry, autobiography. Attention is given to Chicano prose styles and the historical and cultural movement in which they develop. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 152.)

138. Chicano Poetry (4)
An analysis and discussion of major forms and modes of Chicano poetry, with primary emphasis on the developing styles of the poets and on the study of texts' and authors' historical moments. Speaking, writing, and reading knowledge of Spanish is required. (Cross-listed with Lit/Sp 153.)

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 Lit/En 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 and Culture (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.

144. 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. (Cross-listed with Com/Cul 179.)

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 Lit/Sp 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.)

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.

155. 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. (Cross-listed with Pol. Sci. 104A.)

156. Civil Liberties—The Rights of Criminals and Minorities (4)
This course examines the legal issues surrounding the rights of criminal suspects, as well as the rights of "marginal" groups such as aliens, illegal immigrants, and the mentally ill. It also includes a discussion of the nature of discrimination in American society. (Cross-listed with Pol. Sci. 104C.)

157. Ethnic Conflict in the Third World (4)
A comparative analysis of ethnic conflict and of conflict resolution by consociational methods in Lebanon, Cyprus, Malaysia, Burundi, and South Africa. Comparisons will also be made with the United States, other Western countries, and other Third World countries. (Cross-listed with Pol. Sci. 135A.)

158. Immigration Policy and Politics (4)
A comparative analysis of attempts by the U.S., Western Europe, and Japan to initiate, regulate, and restrict immigration from the Third World, 1940 to present. Social and economic factors shaping immigration policies, anti-immigrant movements, and political parties in industrialized countries. (Cross-listed with Pol. Sci. 150A.)

160. Black Politics and Protest in the Early 20th Century (1895–1941) (4)
A discussion of social and political movements ascribed to the black community from 1895 to 1941. Topics will range from accommodation strategies to pressure politics. Course will seek lucid definitions of what constitutes a community and its politics.

161. Black Politics and Protest Since World War II (4)
A discussion of social and political movements ascribed to the black community since 1941. Topics will range from Supreme Court challenges to Black Power to political insiderism. Course will seek lucid definitions of what constitutes a community and its politics.

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.

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.

169. African Society and the Slave Trade (4)
Topics include trans-Saharan trade, slavery within African societies, Atlantic slave trade, problems of numbers exported and profitability, impact of slave trade on African societies, and the abolition of the slave trade. (Cross-listed with HIAF 130.)

170. Slavery and the Atlantic World (4)
An examination of the emergence and consolidation of slave societies in regions of the Caribbean and British North America from the seventeenth through the early nineteenth centuries. (Cross-listed with HIUS 135.)

171. Slavery and Freedom in the Nineteenth Century (4)
An examination of social, cultural, and political dimensions of the transition from slave to wage labor in the era of the Civil War, Reconstruction, and the Gilded Age. (Cross-listed with HIUS 136.)

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 Lit/En 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 Lit/En 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 Lit/En 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 Lit/En 186.)

176. Black Music/Black Texts: Communication and Cultural Expression (4)
This course explores the 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 Lit/En 187.)

177. African Heritage in Contemporary Drama: African, Caribbean, and African American (4)
From Lorraine Hansberry's Raisin in the Sun to the latest plays of Ed Bullins, black drama has mirrored and, occasionally, forecast the mood and aspirations of black people in America. The course examines plays, playwrights, and participants in contemporary black theatre. (Cross-listed with THHS 109.)

178. Introduction to Oral Music (4)
An introductory study of oral music in Western and non-Western cultures, with emphasis on the impact of oral transmission of ideas and customs, and the nature of improvisation in various indigenous cultures. Music studied includes Afro-American, African, Asian, and Oceanian. (Cross-listed with Music 126.)

179A-B. Music of African Americans (4-4)
The first quarter of this course will investigate the vocal music of African American culture, primarily the development of the spiritual and the blues traditions, while the second quarter will critically study the history of jazz in America. (Cross-listed with Music 127A-B.)

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. American Slave Communities in Comparative Perspective (4)
A reading and discussion seminar that explores topics related to the emergence, consolidation, and destruction of plantation slave regimes in regions of the Caribbean and the United States. Topics will vary. (Cross-listed with HIUS 164.)

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
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.

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.

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 and Methods of Ethnic Studies (4)
A critical exploration of the ways in which theories and methods 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.

210A-B. Research Seminar in Ethnic Studies (4-4)
This course is a two-quarter research sequence in ethnic studies. The first quarter will cover selected topics of importance in the field of racial and ethnic studies, as well as introduce students to the practice of original discovery research. The second quarter is devoted to the writing of a major research paper in the field. 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.

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. Advanced Theories and Methods in Ethnic Studies (4)
This course explores the nature and content of disciplinary boundaries in the social sciences and humanities, and looks at the intersections between and among fields of study.

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 Ethnic Identity (4)
This course studies the body cross-culturally as a site for the construction of gender, sex, ethnic, and racial identities.

257A-B. Language, Inequality, Modernity (4-4)
A critical review of the role that theories of language and discursive practices have played in the construction of modernity and the legitimation of social inequality. First quarter covers the seventeenth century through 1970. The second quarter covers 1970 through the present.

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.

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 winter and spring quarters of the second year of graduate studies.

295A-B-C. Dissertation Seminar (4-4-4)
For students advanced to doctoral candidacy. It will include discussion, criticism, and revision of dissertation drafts, and of work to be submitted for publication.

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.

Frontiers of Science

This program has been disestablished.

Greek Literature

See Literature.

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, including anthropology, economics, 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 (forms officially designating health care–social issues a minor and listing the specific course work selected by the student) and petitions (forms requesting changes in or exceptions to course requirements) for the health care–social issues minor 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 G.P.A.) are eligible and can earn from four to sixteen units of academic credit for the internship experience.

Resource materials, information, workshops, and other supplementary programs for students considering health care careers are also available through the Career Services Center, Student Health Service, and faculty advisers in the academic departments. Further information on these programs and activities is available at the Interdisciplinary Programs Office, Literature Building, Second Floor, Room 3238, Warren College.

Health Care–Social Issues Minor Requirements

The minor consists of six courses (three required and three electives, chosen from a list of approved courses). At least four courses must

be taken at the upper-division level. Upper-division electives must be chosen from a department other than that of the student's major and must be distributed in two or more disciplines. A lower-division elective course that is not health-related but is a prerequisite to an upper-division course, must be followed by a health-related upper-division course in the same department. 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

Three courses to be chosen from the following list. At least two must be upper-division and from a department other than that of the student's major.

Anthropology

Lower-Division

10—Human Origins: Introduction to Anthropology
22—Cultural Anthropology: Introduction

General

128—The Anthropology of Medicine
191—Seminar in Medical Anthropology
193—Witchcraft, Shamanism, and Psychiatry

Biological Anthropology

180—Anthropology and Aging

Contemporary Issues

22—Human Sexuality
40—The AIDS Epidemic
136—Anthropology of Medicine
181—Seminar in Medical Anthropology

Economics

1A-B—Elements of Economics
138A-B—Economics of Health

Philosophy

151—Philosophy of Neuroscience
162—Contemporary Moral Issues
165—Professional Ethics
190—Special Topics
(prior approval of topic required)

Psychology

1—Psychology
2—General Psychology: Biological Foundations
5—Introduction to Abnormal Psychology
8—Psychopharmacology: Everyday Addictions
9—Brain Damage and the Mind
60—Introduction to Statistics
104—Introduction to Social Psychology
153—Clinical Psychology
154—Behavior Modification
155—Social Psychology and Medicine
163—Abnormal Psychology
168—Psychological Disorders of Childhood
179—Drug Addiction and Mental Disorders
181—Drugs and Behavior

Science, Technology, and Public Affairs

181—Elements of International Medicine

Sociology

Lower-Division

1A, 1B—The Study of Society

Cluster B

143—Suicide

Cluster C

135—Medical Sociology
136A—Sociology of Mental Illness: Historical Approach
136B—Sociology of Mental Illness in Contemporary Society

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

Professors

Robert S. Edelman, Ph.D.
Joseph W. Esherick, Ph.D., *Hsiu Professor of Chinese Studies*
David Noel Freedman, Ph.D., *Endowed Chair, Biblical Studies*
David M. Goodblatt, Ph.D., *Endowed Chair, Judaic Studies*
Ramón A. Gutiérrez, Ph.D., *Chancellor's Associates Endowed Chair*
Steven Hahn, Ph.D.
Judith M. Hughes, Ph.D.
David S. Luft, Ph.D.
Alden Mosshammer, Ph.D.
Michael E. Parrish, Ph.D.
Paul G. Pickowicz, Ph.D.
Edward Reynolds, Ph.D.
David R. Ringrose, Ph.D.
Martin J. S. Rudwick, Ph.D.
Eric Van Young, Ph.D.
Robert S. Westman, Ph.D.

Associate Professors

Michael A. Bernstein, Ph.D., *Chair*
Dain Borges
Robert Marc Friedman, Ph.D.
Takashi Fujitani, Ph.D.
David G. Gutiérrez, Ph.D., *Academic Senate Distinguished Teaching Award*
Christine Hünefeldt, Ph.D.
Rachel Klein, Ph.D.
Dorothy Y. Ko, Ph.D.
John A. Marino, Ph.D.
Stephanie McCurry, Ph.D.
Michael Meranze, Ph.D.
Michael P. Monteón, Ph.D.
William H. Propp, Ph.D.
Stefan A. Tanaka, Ph.D.
Cynthia M. Truant, Ph.D., *Vice-Chair*

Assistant Professors

Hasan Kayali, Ph.D.
Jill Lepore
Pamela B. Radcliff, Ph.D.

Lecturer with Security of Employment

Ping Hu

Adjunct Faculty

Michal Belknap, Ph.D., *Professor, Cal. Western School of Law*
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., *Associate Professor, Political Science*
Peter Smith, Ph.D., *Professor, Political Science and Simon Bolivar Chair in Latin American Studies*
Steven Shapin, Ph.D., *Professor, Sociology*
Leften Stavrianos, Ph.D., *Professor Emeritus, Clark University*

Emeriti Professors

Guillermo Cespedes, Ph.D.
Stanley Chodorow, Ph.D.
John S. Galbraith, Ph.D.
H. Stuart Hughes, Ph.D.
Gabriel Jackson, Ph.D.
Thomas A. Metzger, Ph.D.
Allan Mitchell, Ph.D.
Earl Pomeroy, Ph.D.
Ramón Eduardo Ruiz, 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. In consultation with this academic adviser, the student should formulate a coherent program of history courses that will lead to completion of the major. All undergraduate majors are strongly encouraged to consult with the academic 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 are as follows: Africa (HIAF), East Asia (HIEA), Europe (HIEU), Near East (HINE), Latin America (HILA), History of Science (HISC), and U.S. History (HIUS). In carrying on its work, the department also administers the following special research and instructional units: the Committee on Area and Ethnic Studies and Research (CAESAR), which includes African Studies, Chinese Studies, Classical Studies, German Studies, Italian Studies, Japanese Studies, Judaic Studies, Middle East Studies, Religious Studies, Russian Soviet Studies, Science Studies; the Project on the History and Culture of the American Southwest; and the Project in Southern (U.S.) History.

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. 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.)
3. Five courses in other fields within the department, selected to complement the student's concentration.
4. THREE of the twelve upper-division courses must be chronologically situated before 1800. These symbols are indicated by the symbol (+).

In special cases, upon approval of the academic adviser, 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 their academic adviser, 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) prior to May 14.

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, of which two or three should be colloquia;
2. Three quarter-courses in a field other than the primary one, of which one course should be a colloquium unless the requirement of three colloquia has been satisfied in the major field;
3. HITO 196. Colloquium in History;
4. HITO 194 and 195. History Honors—Honors Essay.

Minors in History

The minor consists of at least six courses, of which no more than three may be lower-division. Although there is no specific distribution requirement, the courses should be selected to constitute a coherent curriculum. Prospective minors in history should consult with a departmental adviser for approval of their program.

Education Abroad Program

Students are able 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 Director of Undergraduate Studies before going abroad, and courses taken abroad must be approved by the department. More information on EAP is detailed in the Education Abroad Program of the *UCSD General Catalog*. Interested students should contact the Programs Abroad Office in the International Center.

Education at Home Program (EHP)

Due to budgetary constraints, the Education at Home Program is suspended until further notice.

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.

Applicants must submit their academic records, three letters of recommendation, Graduate Record Examination scores (aptitude only), TOEFL scores for foreign applicants, and samples of their written work. Ordinarily, those admitted have at least a 3.0 grade-point average, with a higher average in history and related subjects. Proficiency in a foreign language is not a requirement for admission (except in Latin America, where a reading knowledge of Spanish is required), but the department urges prospective applicants to begin study of at least one foreign language relevant to the proposed area of concentration as early as possible in their academic careers.

With very few exceptions, students are expected to begin their programs in the fall quarter. The deadline for application is January 15. Normally, master's students do not receive financial aid from the department or the university, except in circumstances where funds are not utilized for support of Ph.D. candidates.

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 graduate 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. 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.
3. Four additional courses chosen in consultation with the student's adviser. Two of these may be in a related field outside the department.
4. 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.

Applicants for admission to these programs must submit their academic records, three letters of recommendation, Graduate Record Examination scores (aptitude only), TOEFL scores for foreign applicants, and samples of their written work. 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 one foreign language will be required during a student's academic career. While proficiency in a foreign language is not a requirement for admission (except in Latin America, where a reading know-ledge of Spanish is required), the department urges prospective applicants to begin study of at least one foreign language relevant to the proposed area of concentration as early as possible in their academic careers. With very few exceptions, students are expected to begin their programs in the fall quarter. The deadline for application is January 15.

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 ancient Near East, with emphasis on the civilization of the northwest Semitic

peoples during the Bronze and early Iron Ages.

2. The history of Israel in the biblical period.
3. 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 related discipline studied with particular attention to East Asia.

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 and speaking knowledge of Chinese and a reading knowledge of a second foreign language related to the student's reasearch 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.

D. Language Requirements

All students must demonstrate a reading and speaking knowledge of one East Asian language and a reading knowledge of a second foreign language related to the student's research interests. Language competencies will be examined through a timed translation exercise (with the use of a dictionary).

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 social and economic history of one region.
3. Medieval Europe, with a specialty in political theory, canon law, or the political history of the eleventh through thirteenth centuries.

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 under (2) above.
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. Candidates should include in their studies the histories of the Andean region, Central America, Cuba, Mexico, and the Southern Cone countries in both the colonial and the national periods. Students will normally choose either the colonial or national period as a major field and the other as the first minor. 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, Cuba, 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

Beginning in fall quarter,1996, competency in two languages in addition to English before advancement to candidacy is required.

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.

VII. 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.

Course Work

A normal full-time program consists of twelve units per quarter. Ph.D. students are expected to complete at least one of the following minimum formal courses of study prior to their examinations: (a) two two-quarter research seminars and eight other courses (which may be a combination of colloquia, conjoined courses, or directed readings); or (b) three two-quarter research seminars (not necessarily in the same field) and six other courses (which may be a combination of colloquia, conjoined courses, or directed readings). Students are encouraged to take at least one colloquium or 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 East Asian, European, and (beginning in fall quarter 1996) Latin American history must demonstrate competency in two foreign languages. Ph.D. candidates in History of Science, and United States history must demonstrate competency in one foreign language. Ancient history requires two modern foreign languages as well as the rel-

evant ancient languages. Additional languages appropriate to the special field of study may be required by the Graduate Committee, in consultation with the student's major field adviser. Language requirements for candidates in fields other than those already mentioned will be set by the Graduate Committee, in consultation with their major field adviser.

Students may satisfy the foreign language requirement in one of the following ways:

A. By passing a proficiency examination administered by the Department of Linguistics with a score of 30 or better.

B. By completing, with a grade of B– or better in each term, a two-year, lower-division se quence in the language approved by the Graduate Committee.

C. By completing, with a grade of B– or better in each term, a one-year, upper-division sequence in the language approved by the Graduate Committee.

D. For languages not covered by the Department of Linguistics' examination, the requirement may be satisfied either by options B or C or by passing a translation examination administered by a faculty mem ber proficient in the language.

NOTE: with reference to options B and C, 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. Courses may have been taken either at UCSD or, with the approval of the Graduate Committee, at another institution.

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. Minor field examinations are written; 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.) In a minor field, a reading list (in the form of a contract) is agreed upon, at least three months in advance, by the student and faculty member administering the minor field examination. The contract is intended to establish what will be expected of the student and to prevent confusion over the material to be covered. The professor composes and grades the written examination.

Students who fail either 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 normative time limits are not exceeded. A second failure results automatically in dismissal from the program.

B. Oral Qualifying Examination and Candidacy

Students are strongly encouraged 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 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. At least three of the examiners must be members of the Department of History. At least two examiners must be faculty members from disciplines outside the Department of History. At least one of the outside examiners must be a tenured member of the faculty. 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. 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 strongly encouraged that students also submit a dissertation prospectus to the committee before the oral examination. The examination 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 may be taken in undergraduate teaching. When such an opportunity is not available, a student may participate in some special research program or teach in instructional 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, and readerships. Graduate students are eligible for one or a combination of the five forms of financial support. Departmental policy has been to seek seven years of support for students in the program. Recent reduction in resources now makes it difficult to give assurances for more than four years. Fellowships and research assistantships are granted by the Office of Graduate Studies and Research upon the recommendation of the department. Teaching assistants are appointed by the department on the recommendation of the Graduate Committee. Readers are appointed by the department upon recommendation of the professor for whose course requires such assistance. Students should, therefore, apply directly to the professor concerned.

Graduate students must maintain a minimum grade-point average of 3.0 to be considered for any type of financial aid; for tuition scholarships, nonresident students must maintain a minimum grade point average of 3.6. 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.

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.) Staff

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. McCurry

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. Gutiérrez

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. Pickowicz, Esherick, and Ko.

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. Pickowicz, Esherick, and Ko.

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. Pickowicz, Esherick, and Ko.

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)
(Cross-listed as Third World Studies 175A.) A survey of precolonial Africa, concentrating on ancient Africa, Islam, state formation, the slave trade and abolition, and European penetration of the interior. *Prerequisite: upper-division standing.* Reynolds. +

HIAF 111. Modern Africa Since 1880 (4)
(Cross-listed as Third World Studies 175B.) 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.* Reynolds

HIAF 120. History of South Africa (4)
(Cross-listed as Third World Studies 176.) 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.* Reynolds

HIAF 130. African Society and the Slave Trade (4)
(Cross-listed as Ethnic Studies 169.) 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.* Reynolds

HIAF 140. Economic History of Africa (4)
(Cross-listed as Third World Studies 178.) Lecture-discussion course on the economic development of sub-Saharan Africa from earliest times to the present. Topics will include: pre-European trade, the Atlantic slave trade, the era of legitimate trade, economic imperialism and the colonial economy, and post-independence economic development. *Prerequisite: upper-division standing.* Reynolds +

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 160/260. Special Topics in the Economic History of Africa (4)
This course will examine selected topics in African economic history. Topics will include the precolonial economy, economics of colonialism, economics of underdevelopment, and postcolonial economic development. 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: completion of several upper-division history courses or consent of instructor. Department stamp required.* Reynolds

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.* Reynolds

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 110. Japan: Through the Twelfth Century (4)
Topics include relations with continental Asia, emergence of the Yamato state, archaic notions of territoriality, the monarchy, relations between the central state and provincial elites, landholding, mythology and religion, and culture of the Heian aristocracy. Fujitani +

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. Fujitani +

HIEA 112. Japan: From the Mid-Nineteenth Century through the U.S. Occupation (4)
Topics include the Meiji Restoration, nationalism, industrialization, imperialism, Taishô 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. Fujitani

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. Fujitani

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.* Fujitani and Tanaka

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. Ko +

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.* Ko +

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.* Ko +

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.* Ko

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. Pickowicz

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. Pickowicz

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. Pickowicz

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.* Ko +

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. Colloquium on 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.

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.* Fujitani

HIEA 162/262. History of Women in China (4)
This course concerns women in Chinese history in Imperial times. The course will focus on women's changing roles in the family, society, and culture. Topics will vary from year to year. Ko

HIEA 163/263. Cinema and Society in Twentieth-Century China (4)
This colloquium will explore the relationship between cinema and society in twentieth-century China. The emphasis will be on the social, political, and cultural impact of film-making. The specific period under examination (1930s, 1940s, post-1949) may vary with each quarter. Topics may vary from year to year. *Prerequisite: previous course work in Chinese history or equivalent.* Pickowicz

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.* Ko

HIEA 165/265. The Chinese Village in Transition: 1930–1956 (4)
A research colloquium that examines social, economic, political, and cultural conditions in North China villages during Nationalist rule, World War II, the Civil War, and the early years of communist rule. *Prerequisites: completion of several upper-division history courses.* Pickowicz

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. Esherick

HIEA 169/269. Literature and Society in Republican China (4)
A colloquium that examines the relationship between literature and society in the 1911-1949 period. Novels, short stories, critical essays, and feature-length films are used to document the social, political, and intellectual history of the Republican era. *Prerequisites: completion of several upper-division history courses.* Pickowicz

HIEA 199. Independent Study in East Asian History (4)
Directed reading for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

EUROPE

Lecture Courses

HIEU 100. Early Greece (4)
The social, political, and cultural history of the ancient Greek world from the Bronze Age to the Persian Wars (2000-480 B.C.). Mosshammer +

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.). Mosshammer +

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. Mosshammer +

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). Mosshammer +

HIEU 105. The Early Christian Church (4)
A study of the origin and development of early Christian thought, literature, and institutions from the New Testament period to the Council of Chalcedon (451). Mosshamer +

HIEU 108. Early Medieval England (4)
Course covers the history of England from Roman times to 1066. Students will study the development of English government, society, and culture. Staff +

HIEU 109. Medieval England (4)
Course covers the history of England from 1066 to the fourteenth century. Students will study the development of English government, society, and culture. *Prerequisite: Humanities sequence or its equivalent/consent of instructor.* Staff +

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.* Staff +

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. Staff +

HIEU 112. The Origins of the Common Law (4)
Course begins with a discussion of the revival of jurisprudence in the twelfth century and then focuses on three areas of the early common law. First, we will cover the court system and its procedure. Second, we will study proprietary and possessory actions in property law. Third, we will discuss the origins of modern contract law. Staff +

HIEU 120. Early Renaissance Italy: Dante to the Medici (1300-1494) (4)
The economic and political 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. Marino +

HIEU 121. Late Italian Renaissance: From Machaivelli to Galileo (4)
The political analysis of Machiavelli and Guicciardini establishes the lines of inquiry to examine society and culture in Italy from the High Renaissance to the seventeenth century. Marino +

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. Marino +

HIEU 123. Renaissance Europe (4)
This course explores the age of the Renaissance from approximately the middle of the fourteenth century to the middle of the sixteenth (1350-1550) as a period of great change and diversity, a dynamic moment of discovery, exploration, and expansion, not only in geography but also in politics, economics, religion, art, and science. Marino +

HIEU 124. The City in Italy (4)
Each of the great Italian cities has a style and heritage all its own. This course considers the social, political, economic, and religious aspects of civic life which gave rise to the unique characteristics of such cities as Florence, Siena, Venice, or Rome. Emphasis will be placed on the function and content of civic art, the architecture of public buildings, and the design of the urban environment. The specific content of the course, the city or cities and periods under consideration, will vary. Marino +

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.* Marino +

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. Ringrose and Marino +

HIEU 127. Age of Expansion: Europe and the World, 1600–1750 (4)
The techniques, economic organization, and institutional evolution of European colonizations in Africa, the Far East, and the Americas. The great geographical discoveries and the beginnings of world trade, with emphasis on comparative aspects from 1600-1750. *Prerequisite: upper-division standing.* Marino +

HIEU 128. Tudor History (4)
This course will examine the social, political, and cultural history of England from 1485 to 1660. *Prerequisite: upper-division standing.* Staff +

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. Truant +

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.* Truant +

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. Luft +

HIEU 133. Lord and Peasant–East and West: Agrarian Revolution (4)
A comparative treatment of the transformation from a feudal to capitalist base of the rural life and economy of East and West Europe. Edelman +

HIEU 134. Russia: Ninth Century to 1855 (4)
The roots of Russian backwardness. The long-range historical impact of dominant personalities (Ivan the Terrible, Peter the Great, Catherine the Great) will be assessed. *Prerequisite: upper-division standing or consent of instructor.* Edelman +

HIEU 135. European Economy and Society: 1000–1750
Underlying structures of rural economy and society, geography, population, resources, technology. Evolution of commercial cities, unification of the European market systems, mercantilism, emergence of bureaucracies. Economic and social background of the industrial revolution. *Prerequisite: upper-division standing or consent of instructor.* Ringrose +

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. Truant +

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. J. M. Hughes

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.* Ringrose +

HIEU 140. The Industrialization of Europe: 1750–Present (4)
The beginning of industrialization in England and its spread through nineteenth-century Europe. World War I and the redefinition of economy: private enterprise vs. social justice, big business vs. state planning, and environmental limitations on "progress." *Prerequisite: upper-division standing or consent of instructor.* Ringrose

HIEU 141. European Diplomatic History, 1870–1945 (4)
The European alliance to 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. J.M. Hughes

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.* Luft

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.* Luft

HIEU 144. Social and Cultural History of Europe since 1945 (4)
Europe in the post-European world. The failure of the wartime Resistance. The restoration of bourgeois society. Economic boom and uncertainty. The new role of meritocracy, labor unions, and public enterprise. Population shifts and the problems of women and foreign workers. Neorealism, existentialism, and the German and Russian cultural revivals. Protest and liberation in Eastern Europe. The European Economic Community. The end of the Cold War. *Prerequisite: upper-division standing.* H.S. Hughes

HIEU 145. European Jewry: 1750–1880 (4)
The era of the emancipation of European Jews with an emphasis on social history and history of ideas. *Prerequisite: upper-division standing or consent of instructor.* Staff

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. Radcliff

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 fo 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.* Truant +

HIEU 148. The History of Women in Europe: From the Early 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.* Truant +

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.* Radcliff

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.* J.M. Hughes

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.* Ringrose

HIEU 152. Italy Since 1860 (4)
Political and social history since the unification, treated primarily in terms of the successive attempts of parliamentary monarchy, fascism, Christian democracy, communism, and right-wing Populism to cope with such basic issues as church-state relations, the problem of the South, uneven economic development, and the cleavages within Italian society. *Prerequisite: upper-division standing or consent of instructor.* H. S. Hughes

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. Mitchell

HIEU 153B. Twentieth-Century France (4)
A study of the social, intellectual, and political currents in French history from the First World War to the present. Lectures, slides, films, readings, and discussions. Mitchell

HIEU 154. Modern German History (4)
A lecture-discussion course on the political and social history of Germany during the nineteenth and twentieth centuries. *Prerequisite: upper-division standing or consent of instructor.* Mitchell

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.* Luft

HIEU 156. Russia: 1855 to the Present (4)
The long-term causes of the Revolution and its ultimate consequences. Course will consider the roles of Herzen, Lenin, Stalin, and Nicholas and Alexandra. HIEU 134 is not a prerequisite for HIEU 156. *Prerequisite: upper-division standing or consent of instructor.* Edelman

HIEU 157. Early Soviet Social History (4)
This course will stress the class struggle and the construction of socialism in Russia between the Revolution and World War II. The fate of the peasants and workers will be stressed. Other topics covered will be revolutionary culture, women's liberation, the national question, and the social basis of bureaucracy. *Prerequisite: upper-division standing or consent of instructor.* Edelman

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: department stamp or permission of instructor.* Mosshammer

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.* Mosshammer

HIEU 162/262. Special Topics in the History of Early Christianity (4)
Selected topics in the history of the early Christian church from New Testament times to the middle of the fifth century. Topics will vary from year to year. Mosshammer +

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. *Prerequisite: background in European history.* Chodorow +

HIEU 164/264. Special Topics in Early Modern Europe (4)
Topics will vary from year to year, and students may therefore repeat the course for credit with the permission of the instructor. (Satisfies the Humanities Program minor.) Marino +

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.* Ringrose +

HIEU 166/266. The Agrarian Revolution in Western and Eastern Europe, 1300–1900 (4)
Examines the transition from traditional to modern economy and society in rural Europe from the late medieval period to the turn of the twentieth century. Considerable attention will be paid to theoretical issues. Edelman +

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. Truant +

HIEU 168/268. Special Topics in European Economic History (4)
Analysis of the economic and social interactions between cities and their surrounding regions, comparing the impact of political, commercial, and industrial urbanization in the historical development of regions and countries. Each student will study one such city and present his or her finding to the seminar. Ringrose +

HIEU 170/270. Special Topics in Nineteenth-Century Europe (4)
This course alternates with HIEU 171. Topics will vary from year to year. *Prerequisite: background in European history.* Mitchell

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.* Mitchell

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. J.M. Hughes

HIEU 173/273. Ideology and the Imagination in Modern Britain (4)
Culture and society as reflected in novels and essays. *Prerequisite: background in European history.* J.M. Hughes

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. Ringrose

HIEU 176/276. German Thought in the Romantic Era: 1780–1830 (4)
Works of Kant, Schiller, Schelling, Schlegel, and Hegel will be read. (Satisfies the Humanities Program minor.) Luft

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.* Luft

HIEU 178/278. Special Topics in Modern Russian History (4)
Topics will vary from year to year. May be repeated for credit. Edelman

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. Radcliff, Truant

HIEU 199. Independent Study in European History (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and faculty adviser required.* Staff

HISTORY OF SCIENCE

Lecture Courses

HISC 100. Understanding the Earth: Historical Topics (4)
Selected topics in the history of the ways in which the earth has been understood and interpreted in relation to human beings and to the rest of the natural world. *Prerequisite: upper-division standing.* Rudwick

HISC 101. Problems in the Cultural History of Greek, Medieval, and Early Modern Science (4)
An examination of the sciences produced by Greek, late medieval, and early modern European cultures. The origins of Greek naturalism; Aristotelian and Platonic philosophies of nature; medieval university culture; Aristotle's medieval critics; theology and the medieval scientific imagination; Renaissance scientific patronage; the revolution in printing; artisan and craft traditions; early modern scientific thinkers in medieval perspective: Copernicus, Paracelsus, Giordano Bruno, Kepler, Galileo and Descartes. *Prerequisite: upper-division standing.* Westman +

HISC 102. The Physical Sciences in the Twentieth Century (4)
Major conceptual changes in physical science, and their historical contexts. Quantum and relativity theories, atomic and nuclear physics 'invades' new territories: the rise of astrophysics, geophysics and chemical physics. The changing nature of the physical science enterprise. *Prerequisite: at least one year of science courses.* R.M. Friedman

HISC 103. Gender and Science in Historial Perspective (4)
This course will examine the 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. R.M. Friedman

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.* Rudwick, staff

HISC 105. History of Environmentalism (4)
History of human effects on the natural environment, and with environmentalist interpretations of the history of science. R.M. Friedman

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. Westman +

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.* Rudwick

HISC 108. Science and Technology in the Twentieth Century (4)
The origins and development of the modern scientific-technological enterprise, with science in industry, government, and war. Cultural, social, and economic implications of major scientific advances. The changing social role of the scientist. *Prerequisite: upper-division standing.* Friedman

HISC 109. History of Evolutionary Theories (4)
History of theories to account for the diversity of organisms. Darwin's theory of evolution by natural selection and its modern versions. Implications of evolutionary theories for understanding human beings in relation to the rest of the natural world. *Prerequisite: upper-division standing.* Rudwick, staff

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. Staff

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. Staff

HISC 163/263. Topics in the History of the Life and Earth Sciences (4)
Intensive study of specific problems in the life sciences and earth 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. Rudwick

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. R.M. Friedman

HISC 166/266. Topics in the History of the Social Sciences (4)
Intensive study of specific problems in the history of the social sciences in relation to the natural sciences and mathematics. Staff

HISC 167/267. Topics in 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. *Prerequisite: department stamp required.* Staff

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 and academic adviser required.* Staff

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. Van Young +

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. Van Young

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.* Monteón

HILA 105. South America: Labor, Coercion, and Society in the Nineteenth Century (4)
Course examines how and why forms of forced labor, particularly slavery, persisted and changed in South America after independence and how they shaped the possibilities of economic development. An emphasis is placed on the diversity of contexts in which laborers survived. Hünefeldt

HILA 107. State and Society in Nineteenth and Twentieth Century Latin America (4)
This course seeks to outline the main trends of thought concerning state theory and to evaluate how and when such trends have either been applied or originated in Latin American history. Special consideration will be given to the ways in which peasants and Indians participated in the molding of modern states in Latin America and created their "own" ways of political participation. The final issue we want to address is the question about the "political projects" that can be identified through a reading of nineteenth- and twentieth-century history. Hünefeldt

HILA 110. Progress and Poverty in South America: 1820–1930 (4)
An examination of three phenomena on the continent: the expansion of centralized states, the boom-bust cycles of economic growth, and the persistence of mass misery. The course covers the "export" phase of development, 1820-1930. *Prerequisite: none, although an introductory sequence in history, political science, or economics is useful.* Monteón

HILA 111. Progress and Poverty in South America: 1930–Present (4)
An examination of three phenomena on the continent: the expansion of centralized states, the boom-bust cycles of economic growth, and the persistence of mass misery. The course covers industrialization and its consequences, 1930-present. Monteón

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. Staff

HILA 113. Lord and Peasant in Latin America (4)
Examination of the historical roots of population problems, social conflict, and revolution in Latin America, with emphasis on man/land relationships. Special emphasis on modern reform efforts and on Mexico, Cuba, Brazil, and Argentina. Lecture, discussion, reading, and films. *Prerequisite: upper-division standing or consent of instructor.* Van Young

HILA 114. Social History of Colonial Latin America (4)
The course will examine the evolution of multiracial societies in Brazil and Spanish America, with some attention to the Anglo-American colonies by way of comparison. Particular emphasis on the relationship of race to class and on topics such as race mixture, agrarian structures, slavery, urban life, and crime and social protest. *Prerequisite: upper-division standing.* Van Young +

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.* Monteón

HILA 116. Encounter of Two Worlds: Early Colonial Latin America (4)
A lecture course concentrating on the first century or so of the colonial period, from Columbus to about 1600. Topics will include changing European cosmography, the New World indigenous civilizations, mutual perceptions of the two cultural traditions during the conquest and early colonial eras, and evolving colonial society, all with an emphasis on cultural history. Van Young +

HILA 117. Indians, Blacks, and Whites: Family Relations in Latin America (4)
The development of family structures and relations among different ethnic groups. State and economy define and are defined by family relations. Thus this family approach also provides an understanding of broader socio-economic processes and cultural issues. Hünefeldt

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.* Monteón

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.* Monteón

HILA 122. Cuba: From Colony to Socialist Republic (4)
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 rereading of Inca history between 900 and 1535. Hünefeldt +

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 160/260. Topics in Latin American Colonial History, 1500–1820 (4)
Topics will deal with the social, economic, and political history of the Spanish and Portuguese experience in the new world and the presence of the black and the indian. *Prerequisites: department stamp required and background in Latin American history.* Van Young

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. Gutiérrez

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: department stamp or consent of instructor.* Hünefeldt

HILA 164/264. The Political Economy of Argentina (4)
The course surveys the basic issues in Argentina's development since the late eighteenth century, focusing on the relation of politics to economics and of both to the dramatic economic stagnation of the last fifty years. Each student will be required to write a paper on one of these topics, based on his or her reading of scholarly monographs and journals. Monteón

HILA 166/266. Cuba: From Colony to Socialist Republic (4)
A colloquium on the historical roots of revolutionary Cuba, with special emphasis on the impact of the United States on the island's development and society. Staff

HILA 170/270. Topics in Latin American History, 1820–1910 (4)
Topic will vary from year to year. May be repeated for credit. Staff

HILA 171/271. Special Topics in Latin American History since 1910 (4)
Topic will vary from year to year. May be repeated for credit. Staff

HILA 172/272. Machismo and Matriarchy: The Latin American Social Structure (4)
The course will examine the social history of Latin America as the product of family structure and sexual mores. In addition to looking at the different settings in which the Latin American family evolved, the course will discuss the importance of miscegenation, the role of women, and the current social crisis of the region. Gutiérrez

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 academic adviser required.* Staff

NEAR EAST

Lecture Courses

HINE 100. The Ancient Near East and Israel (4)
The history of Israel is studied in the context of ancient Near Eastern civilization as a whole. Topics include the birth of civilization in Southern Mesopotamia, the Assyrian and Babylonian empires, and the rise of Persia as well as Israel in the biblical period. *Prerequisite: upper-division standing or consent of instructor.* Staff +

HINE 101. Hebrew Prophetic Literature (4)
The prophetic books of the Bible in their historical contexts. The relationship between the prophetic and narrative books. Literary critical analysis, theological issues, reference to ar-

chaeological data. *Prerequisite: upper-division standing or consent of instructor.* D.N. Freedman +

HINE 102. The Jews in Their Homeland in Antiquity (4)
The Jews in Israel from the sixth century B.C.E. to the seventh century C.E. Statehood, nationalism, and autonomy within the framework of the Persian empire, the Hellenistic kingdoms, and the Roman-Byzantine empire. Cultural and religious developments. Prerequisite: upper-division standing. Goodblatt +

HINE 103. The Jewish Diaspora in Antiquity (4)
The Jews outside their homeland in pre-Islamic times, concentrating on the Greco-Roman West and the Parthian-Sasanian East. Topics include assimilation and survival; antisemitism and missionizing; patterns of organization and autonomy; cultural and religious developments. *Prerequisite: upper-division standing.* Goodblatt +

HINE 104. The Bible and the Ancient Near East (4)
The course deals with the Bible in terms of its relationship to the history of ancient Israel and the Near East. It focuses on the biblical prophets, their historicity, their message, and the influence of the events of their day on the prophecy. *Prerequisites: Revelle Humanities 1, HINE 100, Cultural Traditions 1A, or any other courses in Bible. Upper-division standing.* Freedman +

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.* Goodblatt +

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. Kayali

HINE 115. The Middle East since 1600 (4)
Western Asia, Anatolia, and North Africa from 1600 to the present. The Ottoman Empire; European involvement; the rise of modern Turkey, Iran, the Arab states, and Israel. Political, cultural, and religious developments. Kayali

HINE 116. The Middle East in the Age of European Empires (1798–1914) (4)
Examines the contacts of the late Ottoman Empire and Qajar Iran with Europe from the Napoleonic invasion of Egypt to World War I, the diverse facets of the relationship with the West, and the reshaping of the institutions of the Islamic states and societies. Kayali

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. Kayali

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 160/260. Special Topics in the Bible and Ancient Near East (4)
The study of a single book, period, or issue in the Bible, in the context of the ancient Near Eastern world. *Prerequisite: department stamp required or consent of instructor.* Freedman +

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.* Kayali

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.* Goodblatt

HINE 180/280. Cultures of the Ancient Near East (4)
Introduction to language and history of various ancient Near Eastern cultures, including Mesopotamia, Aram, and Canaan. *Prerequisite: upper-division or graduate standing.* Propp

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.* Propp

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.* Kayali

HINE 199. Independent Study in Near Eastern History (4)
Directed readings for undergraduates under the supervision of various faculty members. *Prerequisite: consent of instructor and academic adviser required.* Staff

UNITED STATES

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.* Staff +

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.* Staff +

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. Lepore +

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.* Staff +

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. Meranze +

HIUS 110. The Rise and Fall of the Old South (4)
This course examines the history of the American South from first settlement to the Civil War. Special attention will be devoted to the emergence of slavery and the plantation system, the role of the South in the Revolution and Constitution, the relations between planters and yeomen, the development of slave communities, and the growing sectional conflict. *Prerequisite: upper-division standing or consent of instructor.* Hahn

HIUS 111. The Making of the New South (4)
This course will focus on the American South between the Civil War and the civil rights movement. Topics include emancipation and Reconstruction, the new plantation system, agrarian radicalism, segregation and disfranchisement, the onset of industrialization, Southern culture black and white, and the recent struggles for civil and political rights. Hahn

HIUS 112. The Era of Civil War and Reconstruction (4)
This course is chiefly a social and political history of the United States between 1848 and 1877. It explores the developing sectional conflict, disunion and civil war, and the process of reconstructing the nation; and it places the American experience in an international and comparative context. *Prerequisite: upper-division standing or consent of instructor.* Hahn

HIUS 114. California History (4)
(Cross-listed as USP 161.) 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. Staff

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. Staff

HIUS 120. American Politics and Society, 1900–1942 (4)
A lecture-discussion course on American politics and society from the era of Theodore Roosevelt to Pearl Harbor. Among the topics covered: the progressive movement, the impact of the Great War, the economic boom and collapse of the 1920s, and the New Deal. *Prerequisite: upper-division standing.* Parrish

HIUS 121. American Politics and Society, 1942–Present (4)
A lecture-discussion course on American politics and society, Pearl Harbor to the present. Among the topics covered: the origins of the cold war, the Red scare, the civil rights movement, the counterculture of the 1960s, and the neoconservatism of the Nixon-Reagan era. *Prerequisite: upper-division standing.* Parrish

HIUS 122. American Foreign Relations to 1865 (4)
The intellectual, economic, political, and social forces that shaped American policy and attitudes towards other countries

from the colonial era through the Civil War. Topics include the revolution, the origins of neutrality, the Monroe Doctrine, continental expansionism, and the Civil War. Staff

HIUS 123. American Foreign Relations, 1865–Present (4)
The intellectual, economic, political, and social forces that shaped American policy and attitudes towards other countries since the Civil War. Topics include imperialism, the world wars, American-Soviety relations after 1945, the cold war, Vietnam, and contemporary developments. Staff

HIUS 126. Power in American Society (4)
(Cross-listed as Political Science 110J.) 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. Hahn, Strong

HIUS 130. Cultural History from 1607 to the Civil War (4)
This course will explore connections between American culture and the transformation of class relations, gender ideology, and political thought. Topics will include the transformation of religious perspectives and practices, republican art and architecture, artisan and working-class culture, the changing place of art and artists in American society, antebellum reform movements, antislavery and proslavery thought. Prerequisite: upper-division standing or consent of instructor. Klein +

HIUS 131. Cultural History from the Civl 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. *Prerequisite: upper-division standing or consent of instructor.* Klein

HIUS 135. Slavery and the Atlantic World (4)
(Cross-listed with Ethnic Studies 170.) An examination of the emergence and consolidation of slave societies in regions of the Caribbean and British North America from the seventeenth century through the early nineteenth century. +

HIUS 136. Slavery and Freedom in Nineteenth-Century U.S.: Images and Realities (4)
(Cross-listed with Ethnic Studies 171.) An examination of social, cultural, and political dimensions of the transition from slave to wage labor in the era of the Civil War, Reconstruction, and the Gilded Age.

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. Bernstein

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. Bernstein

HIUS 146. Early American Labor History, 1600–1850 (4)
A history of labor systems and activity in early America. The course will address work relations affecting Indians, slaves, artisans, indentured servants, laborers, yeomen, and tenant farmers as well as wrk culture, political consciousness, labor organization, and working-class protest. *Prerequisite: upper-division standing.* Staff +

HIUS 148. The American City in the Twentieth Century (4)
(Cross-listed as USP 103.) 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 dealth with historically. Staff

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. D. Gutiérrez

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.* Parrish +

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.* Parrish

HIUS 152. The Trials of America (4)
An in-depth look at the civil and criminal trials that have shaped the legal and constitutional history of the United States from the colonial period to the present. The relationship between law and society will be explored through a series of cases that examine freedom of the press, insanity and the law, impeachment, treason and sedition, and tort liability. *Prerequisite: upper-division standing or consent of instructor.* Parrish

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. Parrish +

HIUS 154. Western Environmental History (4)
(Cross-listed as USP 160.) 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. Staff

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.* McCurry +

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.* McCurry

HIUS 158. Social and Economic History of the Southwest I (4)
(Cross-listed as Ethnic Studies 130.) 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. Gutiérrez, R. +

HIUS 159. 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. Gutiérrez, R.

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 160/260. Industrialization and Early American Society (4)
A course examining the initial stages of industrialization in the late eighteenth and early nineteenth centuries. Special attention to how various communities and trades responded to the intervention of large-scale capital, machine technology, and the rise of factory methods of production.

HIUS 161/261. Popular Politics aned Political Culture in America, 1750–1900 (4)
This course will examine the transformation of political life in America from the mid-eighteenth century to the turn of the twentieth century. We shall focus on three moments during these years: the revolutionary and constitutional period, the Jacksonian period, and the Gilded Age. And we shall look at the nature of popular political participation before the franchise, at the advent of mass politics and partisan mobilization, at the gendered aspects of politics and political culture, and at the rise of popular radicalism. Hahn

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 written work in order to receive graduate credit for the course. Deverell

HIUS 163/263. The Transformation of the American City (4)
Seminar on the transformation of American cities during the eighteenth and nineteenth centuries. We will examine changing urban spatial patterns, cultural institutions, political be-

havior, the relationship of work and home as well as class and gender relations. *Prerequisite: department stamp required.* Meranze

HIUS 164/264/Ethn 181. American Slave Communities in Comparative Perspective (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 in the emergence, consolidation, and destruction of New World slave regimes in regions 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. *Prerequisite: department stamp required.*

HIUS 165. 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.

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. Hahn

HIUS 167/267. Topics in Mexican-American History (4)
(Cross-listed as Ethnic Studies 180.) 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. Gutiérrez, R.

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. Parrish

HIUS 170/270. Topics in Colonial History (4)
Colloquium on selected topics in late colonial history, with special attention to issues often neglected. Topics will vary from year to year, and the course may therefore be repeated for credit. *Prerequisite: department stamp required.* Meranze

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 required.* Meranze

HIUS 172/272. Feminist Traditions in America (4)
In this course original documents are used to explore competing definitions of feminism and the diversity of feminist traditions in the United States from the eighteenth century to the present day. Three arenas of feminist activity are considered—women's social and political activism, the female intellectual tradition, and feminist theory. Documents and topics change annually, so course may be repeated for credit. McCurry.

HIUS 173/273. Topics in American 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 American women's history. Special topics. McCurry

HIUS 174/274. American Society in the Cold War (4)
An inquiry into the social, political, economic, and constitutional impact of the cold war upon American society between 1945 and the present. Parrish

HIUS 175/275. America in the 1930s (4)
The impact of the Great Depression upon American society will be investigated in this reading and discussion course. Among the topics to be covered: the causes of the depression, the nature of the New Deal, political radicalism, popular culture, the arts and literature. Topics will vary from year to year. Parrish

HIUS 176/276. Topics in the History of American Radicalism (4)
This course will explore America's radical tradition by focusing on sources of continuity and change among radical movements. Topics will include the Revolution, Abolitionism, labor radicalism, the women's movement, populism, the New Left, the counterculture. Topics will vary from year to year. Klein

HIUS 177/277. Gender and Sovereignty in the Age of Revolution (4)
Intersection of gender and sovereignty in the Age of Democratic Revolution. Topics include relations between class, gender, the individual, and the states; changing definitions of masculinity and femininity; and women and revolution. Materials from England, France, and the United States. Meranze

HIUS 178/278. American Labor in the Nineteenth Century (4)
Readings in the comparative historiography of labor relations, working-class formation, slave emancipation, and industrialization in the United States during the nineteenth century. Compilation of annotated bibliographies and preparation of review essays.

HIUS 179/279. Topics in the History of Art and Politics, Nineteenth and Twentieth Centuries (4)
This course explores the relationship between politics (broadly conceived) and painting. Focus will be on the United States, but readings will include works in European history. Klein

HIUS 180/280. 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: department stamp required.* Gutiérrez

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. Parrish.

HIUS 182/282. Special Topics in Intellectual History: Politics and Culture in the United States, 1776–1860 (4)
An examination of the cultural and political construction of the American nation. Topics include: how citizenship and national community were imagined and contested; the importance of class, gender, and race in the nation's public sphere; and debates over slavery, expansion, and democracy in defining national purpose. Meranze

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 academic adviser required.* Staff

TOPICS

Courses

HITO 100. Religious Traditions: Ancient Near Eastern Religions (4)
A comprehensive study of the ancient religious traditions of the world. The course will cover tribal religions, classical polytheism, and the religion of the ancient Hebrews. *Prerequisite: upper-division standing.* Staff +

HITO 101. Religious Traditions: Judaism, Christianity, Islam (4)
A comprehensive study of the Western religious traditions. The course will cover Judaism, Christianity, and Islam. *Prerequisite: upper-division standing.* Staff +

HITO 102. Religious Traditions: South and East Asian Religious Traditions (4)
A comprehensive study of the Asian religious traditions. The course will cover Hinduism, Buddhism, Taoism, Shinto, and Confucian thought. *Prerequisite: upper-division standing.* Staff +

HITO 110/210.The History of Economic Thought (4)
A survey and examination of the development of economic theory from its classical antecedents through the Keynesian revolution. Emphasis on three major traditions in economic thought: classical political economy, neoclassical economic theory, and Keynesian economics. These traditions will be evaluated in terms of both their chronological development and theoretical maturation. *Prerequisite: introductory economics or consent of instructor.* Bernstein

HITO 111/211. Marxian Economic 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.* Bernstein

HITO 112. The History of Psychoanalysis (4)
A lecture-discussion course tracing the development of psychoanalysis. The late nineteenth-century intellectual context. Freud's major contributions. Psychoanalysis in practice. Post-Freudian transformations. *Prerequisite: upper-division standing or consent of instructor.* J.M. Hughes

HITO 113. Architects, Clients, and the Public: 1550–1950 (4)
From Michelangelo to Mies van der Rohe. Focus on Rome, Vienna, Paris, London, Washington, Chicago, New York. H.S. Hughes

Colloquia

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HITO 161/261. The Rise of Capitalism (4)
An inquiry into the theoretical issues and debates associated with the rise of capitalism as a world system between the fourteenth and nineteenth centuries. Authorities considered will include Karl Marx, Max Weber, Maurice Dobb, Immanuel Wallerstein, Eric Hobsbawn, Perry Anderson, Robert Brenner, Eugene Genovese, and Andre Gunder Frank. Hahn

HITO 162/262. Economic Development in Historical Perspective (4)
An inquiry into economic growth and development as a process of historical transformation. Topics will vary from year to year, but some examples are: the transition from feudalism to capitalism in Europe and North America; the social and political tensions accompanying the rise of capitalism; the role of the state and the juridical environment in economic development; and the sources and organization of the managerial and financial control of enterprise. Bernstein

HITO 163/263. Topics in the History of Economic Thought (4)
A course focusing on the development of economic theory from its classical antecedents to the present day. Themes will vary from year to year, but some examples are: classical political economy, Marxian economic analysis, and the marginalist revolution. *Prerequisite: introductory economics or consent of instructor.* Bernstein

HITO 164/264. Gender Differences in Historical Perspective (4)
An inquiry into how over the past century a number of disciplines (principally psychoanalysis, psychology, and anthropology) have treated gender differences. *Prerequisite: department stamp or consent of instructor.* J. M. Hughes.

HITO 167/267. Cultural History of the Early Modern Europe and Early America (4)
A comparative examination of the cultural history of early modern Europe and early America (1500–1800), with special emphasis on questions of religion and magic, ritual, print culture, and cross-cultural encounters. Lepore +

HITO 170/270. Time, Space, and the Politics of Development (4)
This course will focus on the idea and practice of development as a way to examine the transformation of spatial and temporal categories in modern society. Topics will range from the conceptual—notions of temporality—to the pratical—modernization in the non-West. Topics vary from year to year. Tanaka

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. Staff

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. Staff

HITO 196. Colloquium in History (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. Staff

HITO 197. Field Study (4)
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.* Staff

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.* Staff

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.* Staff

GRADUATE

Graduate standing is a prerequisite for all graduate-level courses.

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 201. Theory and Method in Historical Research (4)
A weekly reading/writing seminar that seeks to introduce students to major theoretical and analytical trends in writing of history. Themes will vary but will include interdisciplinary approaches to historical research and method. Students from all fields welcome, although the emphasis in the course will be on the modern era (1789–present). Bernstein and departmental faculty

HIGR 202. An Inquiry Concerning Historical Understanding (4)
This seminar will concern the difficulty of understanding past beliefs which are no longer ours, and the ways in which this recurrent misunderstanding marked the encounter of the other. Our attention will be focused on two historical moments: the Greco-Roman Antiquity (Pagans v. Christians) and the conquest of the New World (Western Europe v. Indians). We will study in parallel primary and secondary sources. Giard

HIGR 206A-B. Seminar on West African History (4-4)
A two-quarter seminar on selected topics in West African history. One quarter will be devoted to readings and discussions, and the second quarter will be devoted to the writing of individual research papers. 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. Reynolds (Not offered in 1996–97.)

HIGR 210. Literature of Modern Chinese History (4)
This course will introduce students to the monographic literature and the main historiographic controversies of modern Chinese history. *Prerequisite: graduate standing or permission of instructor.*

HIGR 211. Literature of Modern Japanese History (4)
This course will introduce students to the monographic literature and the main historiographic controversies of modern Japanese history. *Prerequisite: graduate standing or permission of instructor.*

HIGR 212. Literature of Modern East Asian History (4)
This course will introduce students to the monographic literature and the main historiographic controversies of modern East Asian history. *Prerequisite: graduate standing or permission of instructor.*

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. *Prerequisite: graduate standing or permission of instructor.*

HIGR 215A-B. 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. 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. Problems in 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. *Prerequisite: graduate standing or permission of instructor.*

HIGR 221. Problems in 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. *Prerequisite: graduate standing or permission of instructor.*

HIGR 222. Problems in 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. *Prerequisite: graduate standing or permission of instructor.*

HIGR 223A-B. Seminar in Medieval History (4-4)
Topics will include the Investiture Contest, concentrating on the personalities involved in the ideas on both sides of the dispute, and the study of the development of canonical jurisprudence, 1140–1234. 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. (Not offered in 1996–97.)

HIGR 224. Latin Paleography (4)
Course trains graduate students in the reading and study of medieval Latin manuscripts. Topics covered include codicology, paleography, and editing of texts. *Prerequisites: Latin and either French or German, and consent of the instructor.* (Not offered in 1996–97.)

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. Edelman

HIGR 226. Knowledge and Meaning (4)
Readings in European intellectual history since the late nineteenth century. Previous work in intellectual history is required. May be repeated as course content changes. Luft

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. Graduate standing. German or French also desirable.* Ringrose (Not offered in 1996–97.)

HIGR 228A-B. Atlantic World in the 18th Century (1650-1825) (4-4)
This two-quarter research seminar will explore the interaction between Europe, Anglo-America, and Ibero-America. Discussion and papers will highlight the commercial growth of the eighteenth century, efforts at imperial control and reform, the emergence of autonomous regional identities, and the political transformation after 1770. 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: HIGR 228A is a prerequisite for HIGR 228B.* May be taught by professors Ringrose, Marino, Van Young, and/or Meranze (Not offered in 1996–97.)

HIGR 229A-B. Seminar in British Empire History (4-4)
Topics on the history of the British Empire. May be repeated 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. (Not offered in 1996–97.)

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 on 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 on 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 233. The Philosophical Foundations of Modern Western Historiography (4)
From Plato to Foucalt, a selection of major philosophical texts studied in context and considered in relationship with key historical issues. Giard

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. 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. Rudwick/Friedman

HIGR 238. Introduction to Science Studies (4)
(Cross-listed as Sociology 255A and Philosophy 209A.) 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 Sociology 255B and Philosophy 209B.) 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 Sociology 255C and Philosophy 209C.) 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. Seminar in the Literature of 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 246A-B. History of Mexico (4-4)
A research and study seminar of two quarters, with primary emphasis on social change in Mexico. The first quarter deals with primary sources, bibliography, and the selection of a research project; in the second quarter, the student will complete the project and submit the study to the scrutiny of the seminar. 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: 246A is a prerequisite for 246B.*

HIGR 247A-B. Readings and Seminar on 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. Readings and Seminar on 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 250. Topics in the National Period of Latin America (4)
One or two topics in the national period or the national history of one country will be analyzed in depth; a reading knowledge of Spanish is expected.

HIGR 251. Topics in the History of Mexico (4)
One or two topics in the history of Mexico will be examined in depth. A reading knowledge of Spanish is expected. Topics vary from year to year, and students may therefore repeat the course for credit.

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. Mariaategui 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. *Prerequisite: graduate standing or consent of instructor.*

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 in the field. Topics vary from year to year. Mosshammer

HIGR 256. Topics in Greek and Roman History (4)
An examination in depth of selected topics in Greek and Roman history. *Prerequisite: graduate standing or consent of instructor.* Mosshammer (Not offered in 1996–97.)

HIGR 260A-B-C. Seminar in 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 261. Seminar in the Hebrew Bible (4)
Examination of texts from the Hebrew Bible with the aim of identifying their authors and the historical circumstances surrounding their composition. Methodological preparation in textual criticism, redaction criticism, and analysis of the relationship between history and literature.

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. Goodblatt

HIGR 265A-B-C. The Literature of 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 266A-B. United States History 1789–1877 (4-4)
Analysis of sources and methods of historical research in the national period to 1877. Readings and original research papers will be 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. Klein (Not offered in 1996–97)

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 269A-B. Topics in U.S. Diplomatic History (4-4)
Critical analysis of major works in U.S. diplomatic history, designed to acquaint the student with the historiographic developments in the field. Readings, discussions, and papers will form the basis of the course. 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. (Not offered in 1996–97.)

HIGR 270A-B. American Legal History (4-4)
A two-quarter research seminar for graduate students focusing upon the development of American legal institutions and ideas from the colonial period to the present, with special emphasis upon the relationship of law to public policy. 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. Parrish (Not offered in 1996–97.)

HIGR 272. Seminar in Southern History (4)
Analysis of major works on the history of the southern United States, focusing on social groups, class and race relations, economic development, culture, and politics. An intercampus course taught jointly by participating faculty from UCSD, UCI, and UCR. May be repeated for credit due to the content changing from quarter to quarter. Special topics.

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. Klein

HIGR 274. Topics in Western American History (4)
This course is a one-quarter colloquium devoted to the examination of major issues in the history of the American West. Topics addressed will include, but not be limited to, the region's social, cultural, environmental, and political history. Historiographical debates will be analyzed, as well as crucial problems related to the definition of the field and region. Students will be expected to participate fully in class discussions and write several essays pertaining to the course themes and readings. Department of History graduate students are encouraged to enroll in research seminar HIGR 275A-B instead of taking this colloquium. *Prerequisite: graduate standing in the Department of History and related disciplines.*

HIGR 275A-B. Seminar in Western American History (4-4)
This course is a two-quarter research sequence in Western American history. The first quarter will cover selected topics of the nineteenth and twentieth centuries of the American West, with an emphasis on the region's social, cultural, environmental, and political history. The second quarter is devoted to the writing of a major research paper in the field. 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: 275A is a prerequisite for 275B.*

HIGR 290. Library Research Methods (2)
Introduction to library research methods for historians, including strategies, current and retrospective bibliography, computer-based resources, and special skills and knowledge for contemporary scholarly research. Includes bibliography project that may be undertaken with concurrent research seminar.

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 296. M.A. Thesis Direction (8)
Independent work by graduate students engaged in research and writing of thesis.

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.)

Program in Human Development

ADMINISTRATIVE OFFICE: 3575 McGill Hall Annex, Muir College

Professors

Elizabeth Bates, Ph.D., *Cognitive Science*
Aaron V. Cicourel, Ph.D., *Emeritus, Cognitive Science/Sociology*
Michael Cole, Ph.D., *Communication*
Jean M. Mandler, Ph.D., *Cognitive Science*
Hugh B. Mehan, Ph.D., *Sociology*
Laura Schreibman, Ph.D., *Psychology*
Joan Stiles, Ph.D., *Director, Psychology*

Associate Professors

Farrell Ackerman, Ph.D., *Linguistics*
Carol Padden, Ph.D., *Communication*

Assistant Professors

Adele Goldberg, Ph.D., *Linguistics*
Shirley McGuire, Ph.D., *Psychology*
Olga A. Vasquez, Ph.D., *Communication*

The Human Development Program Major

The scientific study of human development focuses on issues of growth, development, and behavioral change. The Human Development Program is interdisciplinary, incorporating courses from the Departments of Anthropology, Biology, Cognitive Science, Communication, Linguistics, Literature, Psychology, and Sociology. The curriculum concentrates on development from birth through childhood, and 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 Program in Human Development unifies and coordinates the excellent research and teaching resources currently available on campus in this area, and profiles the factors which 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 two major areas of study within the Program in Human Development are: *Development of the Child* and the *World of the Child*. Within each area there are two further subdivisions. The *Development of the Child* focuses on the individual, and considers issues which pertain to development of specific neural and cognitive processes. The tracks defined under this area are: 1) Neural and Perceptual Development, and 2) Cognitive and Linguistic Development. The *World of the Child* focuses on development within a larger social and cultural context. The tracks defined under this area are: 1) The Social World of the Child, and 2) Childhood.

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, public health, public administration, or social work. Students who are interested in these areas are advised to see the Student Affairs coordinator for assistance in selecting

their 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 the elementary schools. However, 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.

Prerequisites for Program in Human Development Majors

A bachelor of arts degree in human development will be given to students who satisfactorily complete the general-education requirements of Muir, Revelle, Marshall, Warren, or Roosevelt College in addition to the Program in Human Development requirements described below.

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.**

Lower-Division Requirements

The lower-division requirements for the major in human development are:

1. **Introductory course in human development** (HDP 1).
2. **One quarter of statistics** (Psychology 60, Cognitive Science 14, or the equivalent).
3. **Two natural science courses.** This requirement should be fulfilled by taking general introductory courses in the physical sciences (i.e., biology, chemistry, and physics). The following is a list of acceptable natural science courses offered at UCSD:

   Biology: 1,2, 3, 10, 12, 24, 26, 30, 32

   Chemistry: 4, 6A, 6B, 6C, 7A, 7B, 11, 12, 13

   Cognitive Science: 17

   Physics: any of the 1 and 2 series, 10, 11
4. **One introductory computer course** (Cognitive Science 3, CSE 1, CSE 2, Linguistics 63, Economics 60, or the equivalent).
5. **Two formal skills courses.** The courses may consist of any combination of courses in college level mathematics or logic. One quarter of calculus is strongly recommended. Acceptable logic courses include Philosophy 10 and 12.

*Lower-division requirement **1.** and **2.** should be taken prior to enrolling in upper-division coursework. It is recommended that all other lower-division requirements be completed by the end of the sophomore year.*

Upper-Division Requirements

The upper-division requirements for a major in human development are:

1. **one laboratory** course
2. **four foundation** courses
3. **seven upper-division developmental** courses.
4. **one quarter field research**

LABORATORY COURSES (ONE COURSE)

Each student is required to complete **one** laboratory course from the list of approved courses. The laboratory course is intended to introduce students to the methodologies used in the study of human development. Students are to choose **one** of:

Cognitive Science 130: Everyday Cognition
Communication, Com/HIP 108: The Development of Communication
Communication, Com/HIP 116: Practicum in Child Development
Psychology 114: Laboratory in Developmental Psycholinguistics
Psychology 117: Laboratory in Developmental Psychology

FOUNDATION COURSES (FOUR UPPER-DIVISION COURSES):

The study of development provides an essential perspective of how children come to know and interact with the world. However, this perspective must be grounded in a knowledge of the larger fields of study. It is crucial that students of human development are well-versed in the major theoretical and empirical issues of the related parent disciplines. The foundation course list is divided into the two major areas, **Development of the Child**, and **World of the Child**. Within each area a number of foundation courses are indicated. Students are required to take at least **four** foundation courses. **Students must take at least one course in each of the two major areas and may distribute the remaining two courses as they wish.**

DEVELOPMENT OF THE CHILD

Cognitive Science 101A-B-C: Cognitive Theory and Phenomena
Cognitive Science 107A-B-C: Cognitive Neuroscience
Cognitive Science 172: Brain Disorders and Cognition
Psychology 102: Introduction to Sensation and Perception
Psychology 105: Introduction to Cognitive Psychology
Psychology 106: Introduction to Physiological Psychology
Psychology 145: Psychology of Language
Psychology 176: Functional Neuroanatomy

WORLD OF THE CHILD

Anthropology, ANPR 105: Social Anthropology
Anthropology, ANPR 106: Cultural Anthropology
Anthropology, ANPR 107: Psychological Anthropology
Anthropology, ANGN 118: Cognitive Anthropology
Communication, Com/HIP 100: Introduction to Communication & the Individual
Communication, Com/CUL 100: Introduction to Communication & Culture
Psychology 104: Introduction to Social Psychology
Psychology 131: Personality Theory and Research
Sociology, Soc/B 115: Introduction to Sociolinguistics

DEVELOPMENTAL COURSES (SEVEN UPPER-DIVISION COURSES):

Each student is required to complete **seven** developmental courses from the approved list.

The developmental course list is divided into the two major areas, **Development of the Child**, and **World of the Child**. Within each area there are two further subdivisions which together define the four specialized tracks available within the program. Within the seven developmental courses, a distribution requirement must be met by taking **three** courses from those denoted by the asterisk *. (Note that some courses appear in more than one of the tracks.) The distribution requirement is intended to provide students with breadth within the area of human development. In addition to these three courses, each student is required to take **four** other courses chosen from the approved developmental course list. The program allows considerable flexibility in selection of developmental courses. Students may focus on a particular track, or they may define their course of study more broadly by selecting courses across the range of track offerings.

I. DEVELOPMENT OF THE CHILD

A) Neural and Perceptual Development

Biology, BICD 134: Human Reproduction and Development
Cognitive Science 113*: Cognitive Development
Psychology 101*: Intro to Developmental Psychology
Psychology 133: Brain and Cognitive Development
Psychology 168*: Psychological Disorders of Childhood
Psychology 177: Introduction to Behavioral Genetics

B) Cognitive, Linguistic and Affective Development

Cognitive Science 113*: Cognitive Development
Linguistics 171: Child Language Acquisition
Psychology 101*: Intro to Developmental Psychology
Psychology 167*: Social and Emotional Development
Psychology 168*: Psychological Disorders of Childhood
Psychology 174: Communication Disorders in Children & Adults

II. WORLD OF THE CHILD

A) The Social World of the Child

Communication, Com/HIP 123*: Children and Media
Psychology 101*: Intro to Developmental Psychology
Psychology 156: Cognitive Development in Infancy
Psychology 167*: Social and Emotional Development
Sociology, Soc/B 117*: Language, Culture, and Education
Sociology, Soc/B 118: Sociology of Sex and Gender Roles
Sociology, Soc/C 129: The Family

B) Childhood

Anthropology, ANGN 143: Education and Culture
Anthropology, ANGN 180: The Culture of Children
Communication Com/HIP 123*: Children and Media
Literature, LTGN 171: Children's Literature
Sociology, Soc/B 117*: Language, Culture, and Education

Field Research Requirement HDP 191

The field research requirement is intended to provide students with exposure to the study of human development in a placement related to their primary area of interest. One additional quarter of field research may be substituted for one of the developmental courses. Students will work with the field research coordinator to select an appropriate field research experience. A final paper will be required at the end of the quarter. In addition to literature research, students will be required to engage in a minimum of two hours at the research site per week. This course must be taken for a letter grade. *Prerequisites: upper-division standing and consent of instructor.*

Honors in Human Development HDP 194A-B-C

Students are encouraged to participate in the honors program. In order to be admitted to the honors program, students must have a minimum overall grade point average of 3.2, and a 3.5 GPA for courses taken in the human development major. Students in the honors program are expected to complete the following courses in addition to those indicated for the major:

1. An advanced course in Statistics or Experimental Design
2. A year-long independent research project, which results in an Honors Thesis.

The Minor Program

A total of **six** courses are required to complete the minor in human development. These include the **Introduction to Human Development course**, plus **three** courses denoted by the asterisk from the developmental course list, plus **two** additional courses from the developmental course list.

FINISH IN FOUR PLAN

FALL	WINTER	SPRING
FRESHMAN YEAR		
natural science	natural science	computer
formal skills	formal skills	
	HDP 1	
SOPHOMORE YEAR		
statistics	lab	foundation
foundation	foundation	foundation
JUNIOR YEAR		
distribution	distribution	distribution
distribution	distribution	advanced statistics**
SENIOR YEAR		
distribution	distribution	field research
Honor's Thesis**	Honor's Thesis**	Honor's Thesis**

**Only required for students participating in the HDP Honors Program

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.

UPPER-DIVISION

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 honors 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 191. Field Research in Human Development (4)
The field research requirement is intended to provide students with exposure to the study of human development in a placement related to their primary area of interest but outside the classroom setting. Students will work with the field research coordinator to select an appropriate field research experience. Students will be required to engage in a minimum of two hours at the research site per week, conduct a literature search, and write a final paper. *Prerequisites: upper-division standing and consent of instructor.*

Humanities

OFFICE: 1512 Galbraith Hall, Revelle College

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)

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 six courses chosen from the listings of the Departments of History, Philosophy, Literature, Visual Arts, Music, and Theatre. All six courses *may* be selected from the upper-division offerings, but at least three upper-division courses *must* be included. Effective winter 1995, students for whom Humanities 1-5 fulfill general education requirements may use three of these courses on the humanities minor.

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 humanities minor:

Example 1:

History: HILD 3BC: European Society and Social Thought
History: HILD 11: East Asia and the West
Literature: LTGN 140B: Modern Chinese Literature in Translation
Philosophy 123: Ethical Theories
Philosophy 164: Philosophy of History

Example 2:

History: HILA 102: Latin America in the Twentieth Century
History: HIAF 111: Modern Africa since 1880
Literature: LTGN 136: Latin American Literature in Translation
Literature: LTEN 184: Afro-American Poetry
Music 119: Music of the Nineteenth Century
Visual Arts 126A: African and Afro-American Art

Example 3:

Literature: LTEN 145: The English Novel: Modern Period
Literature: LTEN 146: Women and English/American Literature
Literature: LTGN 148: The Bible and Western Literature
Philosophy 150: Aesthetics
Philosophy 152: Philosophy and Literature
Theatre: TH/HIS 1: Drama Survey: Tragedy

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, 1512 Galbraith Hall.

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.

International Relations and Pacific Studies Graduate School (IR/PS)

OFFICE: Building 4, Level 1, Robinson Building Complex

Professors

Peter Cowhey, Ph.D.
Richard Feinberg, Ph.D., *Dean*
Peter Gourevitch, Ph.D.
Stephen Haggard, Ph.D.
Chalmers Johnson, Ph.D., *Emeritus*
Miles Kahler, Ph.D.
Alex Kane, Ph.D.
Lawrence Krause, Ph.D.
Ellis Krauss, Ph.D.
Bruce Lehmann, Ph.D.
Gordon MacDonald, Ph.D.
R. John McMillan, Ph.D.
Susan Shirk, Ph.D.

Associate Professors

Roger Bohn, Ph.D.
Takeo Hoshi, Ph.D.
Andrew MacIntyre, Ph.D., *Associate Dean*
Barry Naughton, Ph.D.
Matthew Shugart, Ph.D.
Yasu-Hiko Tohsaku, Ph.D.

Assistant Professors

Taekwon Kim, Ph.D.
Ulrike Schaede, Ph.D.
Barbara Walter, Ph.D.
Christopher Woodruff, Ph.D.

Adjunct

Wayne Cornelius, Ph.D.
Paul W. Drake, Ph.D.
Theodore Groves, Ph.D.
J. Luis Guasch, Ph.D.
Germaine Hoston, Ph.D.
David Lake, Ph.D.
David Mares, Ph.D.
Michael May, Ph.D.
Akimasa Mitsuta, Ph.D.
Paul Papayoanou, Ph.D.
James Rauch, Ph.D.
Peter H. Smith, Ph.D.
Dale Squires, Ph.D.
Christena 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; computer science 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 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. For further information, call (619) 534-3400.)

Interviews are not required for admission to the MPIA program, but are available for all applicants who would like further information about the degree programs. Interviews 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. Applicants are advised to schedule appointments well in advance of the January 15 application deadline. To make an appointment, applicants should contact the IR/PS Office of Admissions at (619) 534-5914.

The MPIA is a two-year, full-time program. Those students who enter, however, with no previous language training in Mandarin Chinese, Japanese, Korean, or Spanish will need to spend more time in the program. Part-time study is feasible within the MPIA curriculum. The maximum course load for part-time study is 6 units.

The MPIA Curriculum (ninety-six units)*

Core Curriculum

The Core Curriculum is designed to integrate the diverse subject areas of international management, international relations, and comparative public policy, as well as regional studies and foreign language. All components of the Core Curriculum are required of MPIA students. Core courses list as follows:

- Economics (Managerial and International)
- Management (Accounting and Finance)
- International Relations (International Politics and The Politics of International Economic Relations or International Security)
- Policy-Making Processes (two-quarter sequence)
- Regional Specialization: Students are required to specialize in one particular country or region in the Pacific. To fulfill this requirement, students must take two courses in one of four areas: China, Japan, East Asia, or Latin America. (Additional areas will be incorporated into the curriculum as the school expands.)
- Foreign Language: A minimum level of language proficiency must be met through ex-

amination prior to award of the MPIA degree. Students' designated foreign language must correspond to the geographical area selected for regional specialization.

- Quantitative Methods (two-quarter sequence)
- Policy Workshop (two-quarter sequence)

*Note: The MPIA curriculum is currently undergoing minor revision. Students are advised to check with IR/PS for curriculum requirements.

TWO-YEAR MASTER'S PROGRAM

First Year

Fall
Policy-Making Processes (4)
Managerial Economics (4)
International Politics (4)
Quantitative Methods (2)
Elective (4)/Language (4)

Winter
Policy-Making Processes (4)
International Economics (4)
Accounting (4)
Quantitative Methods (2)
Elective (4)/Language (4)

Spring
The Politics of International Economic Relations (4) or International Security (4)
Finance (4)
Elective (4)
Elective (4)/Language (4)

Second Year

Fall
Policy Workshop (4)
Elective (4) *or*
Regional Specialization* (4)
Elective (4)/Language (4)
Elective (4)

Winter
Policy Workshop (4)
Elective (4) *or*
Regional Specialization* (4)
Elective (4)/Language (4)
Elective (4)

Spring
Elective (4)
Elective (4) *or*
Regional Specialization* (4)
Elective (4)/Language (4)

*Two regional specialization courses are required.

This program summary represents a sequence of courses that most MPIA students are likely to take.

Concentrations and Electives

The MPIA program's elective course work allows for flexibility in response to the wide diversity of marketplace employment options as well as in students' backgrounds, interests, and needs. Students have the opportunity to declare a career concentration or regional concentration. Although concentration in a career or regional area is not mandatory, it enables individuals to work closely with other students and faculty who share similar interests. In addition, concentration in a particular career or regional area may serve to enhance career entry opportunities and improve initial on-the-job performance.

Career Concentrations

A career concentration requires that the student take six elective courses in one of four career concentration areas. IR/PS offers career concentrations in the following areas:

International Management: An international management concentration includes intermediate and advanced courses in such areas as corporate finance, accounting, and international marketing–similar to those offered in M.B.A. programs–as well as courses focusing on international business activities such as multinational corporations, project analysis and planning, trade, and risk analysis.

International Relations: This concentration includes course work with an emphasis on political economic factors operating in the global environment, as well as on the traditional areas of international strategy and security. Particular attention is given to the Pacific region as an international subsystem.

Comparative Public Policy: In this area of concentration, courses are provided which compare policies in Pacific region countries in such areas as industry, development, labor, technology, natural resources, health, and social security. The focus is on public sector policies as well as public and private sector interrelations in policy formation and implementation.

International Technology: Management and Policy: The International Technology: Management and Policy concentration is designed for students with technical or scientific undergraduate training. The course work emphasizes technology management and technology policy, allowing students to apply their backgrounds to issues which will be important in the twenty-first century. Courses are chosen by students from a selected curriculum which includes: operations management, technology management, policymaking, corporate finance, international marketing, and environmental policy. The concentration prepares graduates for careers in business (technology management) and government (technology policy).

Note: Specific course requirements for fulfilling a concentration may be obtained at the Student Affairs Office.

Regional Concentrations

A regional concentration requires that the student take two additional regional area courses. The main areas of concentration currently include China, East Asia, Japan, and Latin America.

Policy Workshop

The Policy Workshop (a two-quarter sequence) introduces policy and management case studies simulating real-world issues that students will address in their professional lives. In addition, students participate in an international simulation laboratory where teams compete as corporate managers or government policymakers. The workshop serves as the capstone sequence for the MPIA program and is taken during the final year of residency. Students work together on problems in business and government strategy, utilizing decision analysis and computer simulation techniques in evaluating the problems examined. The material introduced is designed to develop analytical, technical, and communications skills.

Foreign Language

IR/PS considers foreign language competency an indispensable skill for international relations professionals. All students are expected to acquire the language skills necessary to work in the Pacific region. The foreign language proficiency requirement is designed to ensure that

students achieve a level of competency sufficient for professional interaction. Students are placed in foreign language courses based on prior preparation and on the results of a placement test administered during the first week of classes. Students who miss the placement exam should contact the IR/PS Language Program office (RBC 1308) for instructions.

At the present time, students can fulfill the foreign language requirement in Mandarin Chinese, Vietnamese, Japanese, Korean, Spanish, or Brazilian Portuguese. Students may also fulfill their language proficiency requirement in other languages, such as Thai, Tagalog, Bahasa Indonesia, Bahasa Malay, and other Chinese dialects; but, due to resource constraints, IR/PS cannot provide instructional support at this time. Please contact the IR/PS Language Program or the Office of Student Affairs for additional information. The language selected for the requirement must coincide with the student's regional specialization. As languages differ greatly in their relative degree of difficulty, the level of required competency varies among these languages. The minimum required level of proficiency for Spanish is equivalent to 2+ on the Foreign Service Institute Scales (FSI), 2 for Portuguese, and 2- for Mandarin Chinese, Vietnamese, Japanese, Korean, and other Asian languages. Students must pass the proficiency examination administered by the IR/PS Language Program before receiving their degree.

A variety of language courses are offered by UCSD. IR/PS is currently offering four-unit language courses for professional proficiency in the five languages at intermediate to advanced levels. Students with a lower level of language proficiency are encouraged to take beginning and intermediate language courses offered by the Chinese Studies Program, the Japanese Studies Program, the Korea Pacific Program, the ASEAN Pacific Project, and the Department of Linguistics. These courses serve as prerequisites for the language proficiency courses offered at IR/PS, which in turn prepare students for the proficiency examination.

Students may prepare for the proficiency examination in a variety of ways, depending on their language background, aptitude for learning languages, and actual time and effort invested in language study at IR/PS. In general, students fall into one of four categories with respect to language study: 1) those who enter at a superior level of proficiency may be waived out of the language courses; 2) those who enter with a rough equivalence of three years of Chinese or Japanese or two-plus years of Spanish should be able to achieve the requisite level in two years without any intensive language training during the first summer; 3) those who enter with a rough equivalence of two years of Mandarin Chinese or Japanese language or one-plus years of Spanish will usually be able to achieve the requisite level in two years by a combination of intensive language study in the summer and the six language courses for professional proficiency in the two-year program; 4) those who enter with less training in these foreign languages will need to spend at least two and one-half to three years in the program. Intensive summer sessions for two or three summers and language courses during the academic year should enable students to achieve the required proficiency.

The proficiency examination will be given throughout the academic year. Most students take the proficiency examination during the spring quarter of their final year. To take the examination, students must petition the director of the Language Program. The petitioning process involves consultation and advising with the student's current language instructor, the dean of Student Affairs, and the director of the Language Program. Students have two opportunities to take the proficiency examination free of charge. An administrative fee will be charged for each subsequent examination.

Internships

Students are encouraged to participate in various internship programs that are available in business and industry, in federal and state government, and through various foundations and institutions. The school has established links to a number of programs with available internships.

Career Development and Opportunities

The IR/PS Career Services Office provides students with assistance in professional career development. This assistance begins in the students' first quarter and continues through the interviewing process in the final quarter.

Career services include individual advising appointments, workshops, speaker forums, special events, and a library containing international resources and employment opportunity listings. Specialized workshops explore resume writing, cover letters, salary and benefits negotiation, job-offer evaluation, interviewing skills (including videotaped mock interviews), career goals, labor market trends, and effective job search strategies.

The Ph.D. in International Affairs

The Ph.D. in international affairs is designed for students who wish to undertake advanced work in preparation for careers in university teaching and research or as international affairs researchers and specialists in business, government, or research organizations. The number of students admitted to the program each year is small; and within the general requirements, programs of study are designed to fit individual interests.

Requirements for Admission

Students who seek admission to the program must have a B.A. or 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.) Scores from the Graduate Management Admissions Test (GMAT) may be substituted. (Indicate code #4927 for UCSD, Pacific International Affairs.)

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 doctoral work. (UCSD Extension offers an excellent English language program during summer as well as the academic year. For further information, call (619) 534-3400.)

The Ph.D. Curriculum Program of Study

The Ph.D. program prepares students for research careers in international affairs dealing with the Pacific region. In contrast to doctoral programs within social science departments which follow the intellectual agendas of their disciplines, the Ph.D. in International Affairs Program takes an interdisciplinary approach to the economic and policy issues of the Pacific region. The program is designed to combine the analytical skills of specific disciplines with interdisciplinary analysis of policy issues.

Prior to the first year of residence, students select a major and a minor field of study. Within the major field, each student indicates a special interest from which the dissertation may develop. The minor, composed of four courses, is ordinarily a supplementary field within the student's area of concentration. Knowledge of the major and minor fields is evaluated by comprehensive examinations; knowledge of the Pacific region is demonstrated through course work dealing with a country or subregion in the Pacific.

Program Advisory Committee

Each student is assigned a Program Advisory Committee of three faculty members, two of whom must be faculty members at IR/PS. With this committee, the student works out a plan of study which the committee must approve. The student must make satisfactory progress in a coherent program of course work and reading courses in the major and minor fields which meet the approval of the Program Advisory Committee.

The Major and Minor Fields

At the time of application into the Ph.D. in international affairs program, students must declare a major in one of three fields: international relations, international economic policy and management, or comparative policy analysis. Transfer between majors is discouraged and can only be accomplished through petition. All students are required to take four courses in a minor field.

Students must demonstrate through comprehensive examinations that they have acquired a strong foundation in the theories and methods of the relevant disciplines as well as the ability to apply this disciplinary knowledge to the analysis of policy problems.

Course Requirements

Course requirements vary depending on the field; please refer to the international relations, international economic policy and management, and comparative policy analysis field descriptions for precise requirements for each field. Generally they consist of eighteen to twenty-one courses in the major field and four courses in the minor field.

Course work in both the major and minor fields is typically taken at IR/PS and, with adviser's permission, in related departments. At least one third of all courses must be taken at IR/PS, and the remainder must be graduate courses. The field descriptions are available from the IR/PS Office of Admissions at (619) 534-5914.

Regional Requirement

Students must take at least three courses on policy processes and issues in the Pacific region. These courses may consider the Pacific region as a whole, a subregion, 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 examinations on regional areas are not required.

Quantitative Methods

One sequence selected from the following:
IP/Core 453, 454. Quantitative Methods (2-2)
Econ. 120A-B-C. Econometrics (4-4-4)
Econ. 205. Mathematics for Economists (non-credit)
Math. 181A-B. Introduction to Mathematical Statistics (4-4)
Math. 183. Statistical Methods (4)

Graduate Policy Seminar

Doctoral students must participate in the Graduate Policy Seminar beginning in their third year of study and as long as they remain in residence. The course requires students to make presentations of work in progress, whether in the form of literature reviews, research papers, and a dissertation prospectus, or chapters of the thesis.

Language Requirement

Students are expected to achieve a high level 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 examinations in their major and minor fields, but the precise details of the exam structure differ by field; see the sections below for details. It is important to notify and consult with the Program Advisory Committee before attempting a comprehensive exam.

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 four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

Ph.D. Curriculum Requirements for a Major in International Relations

The Ph.D. curriculum in international relations is designed to provide the student with basic training in the theory of international politics as well as the opportunity to specialize in one of three focus fields: international politi-

cal economy, comparative foreign policy, and security. All students are required to develop regional expertise. From the second year, all students in residence are also required to attend the Workshop on International Relations. This seminar, run jointly with the international relations faculty of the Department of Political Science, provides the opportunity to present work in progress.

Students concentrating in international relations will take a written examination in the theory of international relations, a written focus field examination, and an oral examination administered by a committee drawn from the international relations faculty of IR/PS and the Department of Political Science.

Ph.D. Curriculum Requirements for a Major in International Economic Policy and Management

The Ph.D. curriculum in international economic policy and management is designed to provide the student with basic training in the techniques of modern economics. The first year the student takes courses which are tool-oriented and therefore heavily mathematical. In the second year, more applied subjects are studied. All students are required to develop regional expertise.

Students concentrating in international economic policy will take a written comprehensive examination in microeconomics, macroeconomics, and econometrics, a written field examination in an applied area of economics, and an oral examination administered by a committee drawn from the economics management faculty of IR/PS and the Department of Economics.

Ph.D. Curriculum Requirements for a Major in Comparative Policy Analysis

The Ph.D. curriculum in comparative policy analysis is designed to provide an introduction to comparative politiical analysis, political economy, and policy analysis. Students may specialize either in comparative politics or comparative policy analysis and are expected to develop expertise in a particular region.

Students concentrating in comparative policy analysis will take a major examination plus a policy analysis focus field examination. The general and focus field portions of the examinations will have both written and oral components.

Specific course requirements for all Ph.D. major and minor fields of study are available through the IR/PS Office of Admissions at (619) 534-5914.

International Career Associates Program

The International Career Associates Program 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 an academic year at IR/PS usually beginning in mid-September and ending in mid-June. 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 such areas 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.

IR/PS offers:

- An individualized one-year program leading to a Certificate of Study
- An optional summer program preceding the academic year
- An academic tutorial program
- Opportunities to interact with world-renowned Pacific Rim scholars and policymakers
- Special seminars and lectures by academics and professionals
- IR/PS-sponsored cultural events and field trips to local, state, and national organizations and government offices

For further information, contact the International Career Associates Program office at (619) 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 Professor Lawrence Krause, the program promotes the understanding of Korea in an international context and encourages the study of Korea in a university setting by offering courses in the country's society, economics, language, and policymaking. Research is supported on contemporary Korean society and policy issues. Outreach to the community is offered through seminars, lectures, courses, and cultural events, including performances and exhibits in the Korean arts.

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 Korea-Pacific Program is supported by a strong Korean language component, encourages a broad understanding of Korean culture and history, and has a strong community base in and around its university setting.

The ASEAN-Pacific Project

The ASEAN-Pacific Project seeks to encourage greater understanding between the United States and the member countries of the Association of Southeast Asian Nations (Indonesia, Thailand, Malaysia, Singapore, the Philippines, Vietnam, and Brunei). The project was launched in 1995 and builds upon the foundation of IR/PS's pre-existing Vietnam-Pacific Project.

Directed by Associated Professor Andrew MacIntyre, the ASEAN-Pacific Project aims to promote understanding and awareness of Southeast Asia which has emerged as one of the fastest growing economic regions in the world, and an increasingly important trade and investment partner for the United States. The project focuses on supporting students wanting to study Southeast Asia through a fellowship and travel grant program. Another area of activity is research on political and economic change in Southeast Asia and a popular guest speaker series. The project also continues to support IR/PS's Vietnamese language program and has hosted several students from Vietnam-

ese agencies who have enrolled in the International Career Associates Program and the MPIA Program.

Like its forerunner (the Vietnam-Pacific Project), the ASEAN-Pacific Project is largely made possible through private-sector funding.

MPIA CORE CURRICULUM

IP/Core 400A-B. Policy-Making Processes (4-4)
A two-course sequence 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.

IP/Core 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.

IP/Core 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.

IP/Core 410. International Politics (4)
Introduction to international politics focusing on the rise and demise of the Cold War. Combines postwar diplomatic history with the core concepts and analytical approaches of international relations. Emphasizes the interplay between structure and strategy.

IP/Core 411. The Politics of International Economic Relations (4)
The course presents explanations for the political organization of international economic relations in different issue-areas. Additional topics include international economic inequality, efforts by states to manipulate economic relations for strategic gain, and the prospects for regional and global organizations.

IP/Core 412. International Security (4)
Examination of origins, character, and consequences of fundamental security dilemmas of states and possible means of resolution. Phenomena explored include: causes of war and conditions of peace; arms races; deterrence; balance of power; alliances; security regimes; and current U.S. strategic debate.

IP/Core 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.

IP/Core 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: IP/Core 420, 453, and 454.*

IP/Core 430. 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.

IP/Core 431. 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 paid to the prospects for political reform in China.

IP/Core 439. 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.

IP/Core 440. Politics and Policy in Latin America (4)
An overview of the contemporary politics in Latin America: democracy, authoritarianism, and revolutionary change. Readings will be mostly comparative, either dealing with groups of countries within Latin America or comparisons between Latin America and other regions of the world.

IP/Core 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.

IP/Core 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.

IP/Core 456A-B. Policy Workshop (4-4)
A two-quarter course sequence. Assignments and class discussions involve: (1)analysis of case histories or corporate and public policymaking and (2)participation in an international simulation laboratory. Students manage corporate and government teams that compete in quality of decisions, forecasting, and analysis. *Prerequisites: IP/Core 400A-B, 401, 403, 410, 411 or 412, 420, 421, 453 and 454, or consent of instructor.*

GENERAL COURSES

IP/Gen 400. 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 Korean War and Sino-Soviet dispute; immigration patterns and their consequences; and Japan's foreign policy.

IP/Gen 402. International Political Economy: Money and Finance (4)
Examination of effects of national policies and international collaboration of public and private international financial insitutions, in particular management of international debt crises, economic policy coordination, and the role of international lender of last resort. *Prerequisite: IP/Core 411 or consent of instructor.* Conjoined with Political Science 144D and 262.

IP/Gen 403. International Political Economy: Trade (4)
This course examines the evolution of the international trading system, emphasizing issues of politics and policy. Topics include developments in the GATT, the emergence of regional trading blocs, protectionism, industrial policy, and the relationship between trade and direct investment. Students choose a particular sector to develop expertise. *Prerequisite: IP/CORE 411 or consent of instructor.*

IP/Gen 406. The Politics of Democratization (4)
This course will examine the following questions: Why do some countries fail and others succeed in establishing democracies? How do leaders "institutionalize uncertainty"? Should economic or political liberalization come first? Why are there periodic "waves" of democratic breakthrough and breakdown?

IP/Gen 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.

IP/Gen 413. The Political Economy of Regulated International Markets (4)
This course examines the politics and economics of world markets that are subject to extensive government regulation. Cases include examples from the services, manufacturing, and commodities markets. The course investigates why there are different types of regulation for each market, how global regulations interact with national regulations, and how firms respond to regulations.

IP/Gen 414. U.S. Strategic Policy Issues in a Changing World (4)
Strategic issues facing the U.S. in the nineties will be described and analyzed. Issues taken up will include nuclear weapons policy, space policy, European and Northeast Asia security policies. Political, military and technical aspects of these issues will be analyzed. *Prerequisite: graduate status or consent of instructor. Some background in political science and in quantitative analysis of issues desirable.*

IP/Gen 415. U.S. Foreign Economic Policy (4)
An examination of the main institutional and political factors affecting American foreign policy with current theoretical debates in international political economy described. Trade policy, monetary policy and macroeconomic coordination, the politics of oil, and foreign direct investment will also be discussed.

IP/Gen 416. Modern Japanese Politics (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.

IP/Gen 417. Models of International Change (4)
The seminar will explore models that account for international change by linking international (systemic or structural) and domestic variables. Particular attention will be given to evolutionary and learning models as they have been employed in a number of disciplines. *Prerequisite: IP/Core 410.*

IP/Gen 420. Principles of Marketing (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: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 421. International Marketing (4)
This course focuses on decision making in international marketing. The impact of cultural, social, political, economic, and other environmental variables on international marketing systems and the decision making process of multilateral marketing operations will be addressed. *Prerequisites: IP/Core 453 and 454, and IP/Gen 420 or consent of instructor.*

IP/Gen 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: IP/Core 421, 453, and 454, or consent of instructor.*

IP/Gen 423. Industrial Organization (4)
The interactions among firms and between firms and consumers. How firms compete and collude. The efficiency implications of different market institutions. Public policy toward industry. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 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 be mostly lectures, with occasional cases. Some international aspects of corporate finance will also be discussed. *Prerequisites: IP/Core 401, 403, 420, 421, 453, and 454, or consent of instructor.*

IP/Gen 425. The Internal Organization of the Firm (4)
The employment relationship. Separation of ownership and control. Principal-agent relationships. Hierarchies. Team Production. Incentive effects of alternative forms of organization. The boundaries between the firm and the market. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 426. Financial Instruments, Institutions, and Markets (4)
Advanced topics covered include hedging and risk reduction using futures and options contracts, the resolution of differences of opinion, information, and incentives among managers and asset holders with different financial contracts, and the implications for the structure of financial markets. *Prerequisites: IP/Core 421, IP/Gen 434; IP/Gen 422 recommended.*

IP/Gen 428. Human Behavior in Organizations (4)
Examination of factors influencing behavior of people in organizations. Psychology of the individual, interpersonal relations, work groups, conflict resolution, organizational structure, rewards and punishments, leadership, and the structures of culture of the larger global sociopolitical environment will be covered.

IP/Gen 429. Quantitative Analysis for Management Decisions (4)
This course is concerned with the systematic analysis of problems. It treats subjects that belong to a general area usually called operations research, management science, or systems analysis. Although a number of analytical tools will be presented, the focus will be on developing a quantitative approach to managerial problems. There will be a continuing emphasis on managerial applications through the use of examples and case materials.

IP/Gen 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.

IP/Gen 432. The Firm in Global Competition (4)
The theory of gains from international trade is used for understanding current issues in trade policy. Then the viewpoint switches from country to firm: What gives firms an edge in international competition? How does firm organization vary across countries? *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 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: IP/Core 403, 421, or consent of instructor.*

IP/Gen 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.

IP/Gen 435. Advanced Topics in International Trade (4)
Assumes student participants have a background in basic theories of international trade. Introduction to advanced theories and current topics in international trade, including technological transfer between countries, trade patterns between North and South, etc. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 436. Public Finance: Taxation (4)
A survey of taxation theory and institutions. Effect of taxation on efficiency and income distribution. Deficit financing and the burden of the debt. Tax system and structure of the U.S. and other Pacific Rim countries.

IP/Gen 437. Strategy and Planning in Production and Operations Management (4)
This course examines manufacturing, distribution, and service activities that are relevant to the strategic management of operations. It explores the everyday control of operations, the design of the production system, and the interface between operations and other aspects of the firm's overall strategy. *Prerequisite: IP/Gen 438 or consent of instructor.*

IP/Gen 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: IP/Core 453 and 454, or consent of instructor.*

IP/Gen 439. International Manufacturing Strategy: Selected Topics (4)
This course covers selected issues emerging from the recent trends in globalization of a firm's manufacturing activities. Topics include globalization of manufacturing base, international comparison of manufacturing management, the role of manufacturing in the global competition. *Prerequisite: IP/Gen 438 or consent of instructor.*

IP/Gen 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: IP/Core 420 or consent of instructor.*

IP/Gen 441. Seminar in Advanced Topics in Production and Operations Management (4)
Studies of advanced analytical techniques in operations management. Emphasis is on the application of various analytical methods to operational problems. Students are encouraged to carry out a research project for the actual application of these techniques. *Prerequisite: IP/Gen 438 or consent of instructor.*

IP/Gen 442. Economic Analysis of Manufacturing Systems (4)
How to evaluate manufacturing process economics. Coast accounting, project evaluation, net present value and other financial measures, making tradeoffs among alternatives, cost of quality losses, assessing intangibles. Impacts of design and operating policies. Fitting manufacturing processes to market and strategy. *Prerequisite: none.*

IP/Gen 444. Product Design and Process Development (4)
Engineering management, emphasizing creation and improvement of products and processes. Cases, lectures, and team exercises set in various industries, including software. *Prerequisites: IP/Gen 438 or consent of instructor plus experience in manufacturing, engineering, or software.*

IP/Gen 445. Entrepreneurship
Student teams (3–5) are admitted to the course on the basis of a proforma business plan. While teams perfect their plans, class discussions cover aspects of creating and planning new businesses, culminating in presentations of their final plans. *Prerequisites: IP/Core 400A-B, 401, 403, 410, 411 or 412, 420, 421, 453, and 454, and consent of instructor.*

IP/Gen 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: MPIA level: IRCO 401 and IRCO 403.*

IP/Gen 450. Comparative Government-Business Relations (4)
Explores the general issue of the interaction between market forces and government, focusing on mediation between public and private sectors. Examines several principal mediation mechanisms: business associations, consultative bodies, and so on. Proposes a typology for examining the logic of membership and the logic of action of the business community.

IP/Gen 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: IP/Gen 401 and 403, or consent of instructor.*

IP/Gen 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 evaluation projects.

IP/Gen 457. Policy 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.

IP/Gen 458. International Environmental Policy (4)
Review of environmental issues, including transboundary air and water pollution, acid rain, ozone depletion, species eradication, whaling, and climate change. Economic, political, and social consequences of international environmental disputes. Current approaches to environmental policy analysis.

IP/Gen 459. 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.

IP/Gen 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 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.

IP/Gen 464. Comparative Economic Development Policy (4)
General theories of economic development, industrialization of developed countries and developing countries, comparison of Asian NIEs and South American NIEs, comparison of Korean economic development and Taiwanese economic development (also of Korea and Japan) will be studied. *Prerequisites: IP/Core 401 and 403.*

IP/Gen 465. Economy of China (4)
Survey and assessment of China's economic development since 1949. Sections on agriculture; industry; foreign trade; and financial and macroeconomic problems. Economic analysis of the state-dominated mixed economy emerging from current reforms. *Prerequisites: IP/Core 401 and 403, or consent of instructor.* IP/*Core 430 recommended.*

IP/Gen 466. Chinese Foreign Policy (4)
Examination of Chinese perceptions of the world, domestic sources of foreign policy, military and security issues, foreign trade, and cultural ties. Relations with the two superpowers will be emphasized. Relations with Japan and the Third World will also be covered.

IP/Gen 467. Policymaking and Political Economy in Japan (4)
The policymaking process in Japan and the interaction and role of state and non-state factors in shaping Japan's economic development. Analysis and comparison, through case studies of industrial policies (toward high-tech and declining industries), and non-industrial policies and their consequences.

IP/Gen 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. *Prerequisites: additional paper and/or examination will be required at the doctoral level.*

IP/Gen 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: IP/Core 401 and 403.*

IP/Gen 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: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 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.

IP/Gen 474. Latin American Societies: Social Classes and State Policies in a Comparative Perspective (4)
Focuses on class structures, political mobilization, and government policies (economic and social policies in particular) in selected South American countries. Special attention will be given to the interaction between domestic and external economic and political processes.

IP/Gen 475. State and Society in Latin America (4)
Comparative survey of the multiple roles of the state in contemporary Latin America, with special emphasis on the politics of economic policy. Analysis of public policies regarding such problems as agricultural production, incomes and wages, stabilization, investment, and external debt in a variety of political settings: authoritarian, reformist, and revolutionary.

IP/Gen 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. *Conjoined with Political Science 235A.*

IP/Gen 478. Mexican Economic Policy (4)
This course offers an overview of economic policy in Mexico. It covers the shift from "stabilizing growth" in the 1950s and 1960s to crisis in the 1970s and 1980s and current reforms. International interactions and current developments are stressed.

IP/Gen 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: IP/Core 401 and 403, or IP/Core 410 and 411, or consent of instructor.*

IP/Gen 483. Comparative Economic Systems (4)
Economic systems and their transformation in developed and developing countries. Socialism and the transition from central planning to the market. Capitalism and government interventions to foster growth or equity. Coverage may include Russia, Japan, Poland, Sweden and Brazil. *Prerequisites: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 484. Korean Politics and Society (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.

IP/Gen 485. The Political Economy of South Korea (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.

IP/Gen 487. Concepts and Aspects of Revolution (4)
Introduction to the analytical and comparative study of revolutionary movements and related forms of political violence. Topics include: the classical paradigm, types of revolutionary episodes, psychological theories, ideology and belief systems, coups, insurgencies, civil wars, terrorism and revolutionary outcomes. *Conjoined with Political Science 140B.*

IP/Gen 489. Political Development of Modern Japan (4)
This course seeks to illuminate issues in contemporary Japanese Politics by examining Japan's politico-economic development since the Meiji era. Particular stress is placed on issues concerning modernity and national identity, and the significance of the role of Japan's developmental state. *Prerequisite: graduate standing or permission of the instructor.*

IP/Gen 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.

IP/Gen 497. Internships (4-12)
Field research in an area relevant to career and/or regional specialization. May be repeated for credit.

IP/Gen 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.

IP/Gen 499. Independent Research (2-12)
Independent research under the guidance of a faculty member in IR/PS. May be repeated for credit.

LANGUAGE COURSES

IP/Lang 1A-B-C. First-Year Korean: Korean Conversation (2-2-2)
Tutorial meetings to practice Korean conversation. Must be taken with IP/Lang 1AX, BX, CX.

IP/Lang 1AX-BX-CX. First-Year Korean: Analysis of Korean (3-3-3)
Introduction to the phonology, orthography, morphology, and syntax of the Korean language. Lectures and practice. Must be taken with IP/Lang 1A, B, C.

IP/Lang 3A. First-Year Vietnamese: Vietnamese Conversation (2)
Training and practice in Vietnamese conversation. *Prerequisite: must be taken with IP/Lang 3AX or consent of instructor.*

IP/Lang 3B. First-Year Vietnamese: Vietnamese Conversation (2)
Training and practice in Vietnamese conversation. *Prerequisites: must be taken with IP/Lang 3BX. Completion of IP/Lang 3A and 3AX or consent of instructor.*

IP/Lang 3C. First-Year Vietnamese: Vietnamese Conversation (2)
Additional training and tutorial in Vietnamese conversation. *Prerequisites: must be taken with IP/Lang 3CX. Completion of IP/Lang 3A/3AX and 3B/3BX or consent of instructor.*

IP/Lang 3AX. First-Year Vietnamese: Analysis of Vietnamese (3)
Introduction to the phonology, orthography, morphology, and syntax of the Vietnamese language. Lectures and practice. *Prerequisite: must be taken with IP/Lang 3A or consent of instructor.*

IP/Lang 3BX. First-Year Vietnamese: Analysis of Vietnamese (3)
Introduction to the phonology, orthography, morphology, and syntax of the Vietnamese language. Lectures and practice. *Prerequisites: must be taken with IP/Lang 3B. Completion of IP/Lang 3A and 3AX.*

IP/Lang 3CX. First-Year Vietnamese: Analysis of Vietnamese (3)
Introduction to the phonology, orthography, morphology, and syntax of the Vietnamese language. Lectures and practice. *Prerequisites: must be taken with IP/Lang 3C. Completion of IP/Lang 3B/3BX and 3A/3AX.*

IP/Lang 11A-B-C. Second-Year Korean: Korean Conversation (2-2-2)
Tutorial meetings to practice Korean conversation. Must be taken with IP/Lang 11AX-BX-CX. *Prerequisites: IP/Lang 1C and 1CX or equivalent.*

IP/Lang 11AX-BX-CX. Second-Year Korean: Analysis of Korean (3-3-3)
A continuation of IP/Lang 1A, B, C. Through lectures and practice, students will review the basic structure of Korean and will be introduced to an intermediate-level analysis of Korean structure. Must be taken with IP/Lang 11A-B-C. *Prerequisites: IP/Lang 1C and 1CX or equivalent.*

IP/Lang 33A. Second-Year Vietnamese: Vietnamese Conversation (2)
Tutorial meetings to practice Vietnamese conversation. *Prerequisites: must be taken with IP/Lang 33AX. Completion of IP/Lang 3A, 3B, 3C and 3AX, 3BX, 3CX or consent of instructor.*

IP/Lang 33B. Second-Year Vietnamese: Vietnamese Conversation (2)
Tutorial meetings to practice Vietnamese conversation. *Prerequisites: must be taken with IP/Lang 33BX. Completion of IP/Lang 33A, 33AX or consent of instructor.*

IP/Lang 33C. Second-Year Vietnamese: Vietnamese Conversation (2)
Tutorial meetings to practice Vietnamese conversation. *Prerequisites: must be taken with IP/Lang 33CX. Completion of IP/Lang 33A, 33B, 33AX, 33BX or consent of instructor.*

IP/Lang 33AX. Second-Year Vietnamese: Analysis of Vietnamese (3)
A continuation of first-year Vietnamese. Through lectures and practice students will review the basic structure of Vietnamese and will be introduced to an intermediate level analysis of Vietnamese structure. *Prerequisites: IP/Lang 3A, 3B, 3C, 3AX, 3BX, 3CX and must be taken with 33A or consent of instructor*

IP/Lang 33BX. Second-Year Vietnamese: Analysis of Vietnamese (3)
A continuation of first-year Vietnamese. Through lectures and practice students will review the basic structure of Vietnamese and will be introduced to an intermediate level analysis of Vietnamese structure. *Prerequisites: IP/Lang 33A, 33AX, and must be taken with 33B or consent of instructor*

IP/Lang 33CX. Second-Year Vietnamese: Analysis of Vietnamese (3)
A continuation of first-year Vietnamese. Through lectures and practice students will review the basic structure of Vietnamese and will be introduced to an intermediate level analysis of Vietnamese structure. *Prerequisites: IP/Lang 33A, 33AX, 33B, 33BX, and must be taken with 33C or consent of instructor*

IP/Lang 100A-B-C. Third-Year Korean (4-4-4)
A continuation of Second-Year Korean. For students who wish to further develop their communicative skills through improving their comprehension, speaking, reading, and writing abilities in Korean. Sino-Korean characters will be introduced in this course. *Prerequisites: IP/Lang 2C and 2CX or equivalent.*

IP/Lang 401-406-411. 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 consent of instructor.*

IP/Lang 402-407-412. 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 consent of instructor.*

IP/Lang 403-408-413. 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 consent of instructor.*

IP/Lang 404-420-424. 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 consent of instructor.*

IP/Lang 425. Second-Year Portuguese Language for Spanish Speakers (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 experience. *Prerequisites: IR/PS students only and IP/Lang 405, 410, 415.*

IP/Lang 405-410-415. 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 consent of instructor.*

IP/Lang 409-414-419. 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 consent of instructor.*

IP/Lang 416-417-418. Chinese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at an advanced-beginning 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 consent of instructor.*

IP/Lang 421-426-431. 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 consent of instructor.*

IP/Lang 422-427-432. 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 consent of instructor.*

IP/Lang 423-428-433. 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 consent of instructor.*

IP/Lang 429. Technical Spanish Language (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 consent of instructor.*

IP/Lang 430. Second-Year Portuguese Language for Spanish Speakers (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 experience. *Prerequisites: IR/PS students only and IP/Lang 405, 410, 415, 425.*

IP/Lang 435. Second-Year Portuguese Language for Spanish Speakers (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 experience. *Prerequisites: consent of instructor. IP/Lang 405, 410, 415, 425, and 430.*

IP/Lang 436. Technical Chinese Language (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 laboratory, exercises, and other activities. *Prerequisite: IR/PS technical concentration admission status or consent of instructor.*

IP/Lang 440. Technical Japanese Language (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 consent of instructor.*

IP/Lang 441-446-451. 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 consent of instructor.*

IP/Lang 442-447-452. 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 consent of instructor.*

IP/Lang 443-448-453. 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 consent of instructor.*

IP/Lang 449. Technical Spanish Language (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 consent of instructor.*

IP/Lang 456. Technical Chinese Language (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 laboratory, exercises, and other activities. *Prerequisite: IR/PS technical concentration admission status or consent of instructor.*

IP/Lang 460. Technical Japanese Language (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 consent of instructor.*

IP/Lang 461-466-471. Chinese 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 Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. *Prerequisite: IR/PS majors only, or consent of instructor.*

IP/Lang 462-467-472. 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 consent of instructor.*

IP/Lang 463-468-473. 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 consent of instructor.*

IP/Lang 469. Technical Spanish Language (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 consent of instructor.*

IP/Lang 476. Technical Chinese Language (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 laboratory, exercises, and other activities. *Prerequisite: IR/PS technical concentration admission status or consent of instructor.*

IP/Lang 480. Technical Japanese Language (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. *Prerequisites: IR/PS technical concentration admission status and IP/Lang 440 and 460, or consent of instructor.*

IP/Lang 481-486-491. Chinese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at the highest level of proficiency to maintain and improve their Chinese language skills through individual training with an instructor. *Prerequisite: IR/PS majors only or consent of instructor.*

IP/Lang 482-487-492. Japanese Language for Professional Proficiency (4-4-4)
This course is designed to enable students at the highest level of proficiency to maintain and improve their Japanese language skills through individual training with an instructor. *Prerequisite: IR/PS majors only or consent of instructor.*

IP/Lang 483-488-493. Spanish Language for Professional Proficiency (4-4-4)
This course is designed to enable students at the highest level of proficiency to maintain and improve their Spanish language skills through individual training with an instructor. *Prerequisite: IR/PS majors only or consent of instructor.*

IP/Lang 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.*

IP/Lang 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

IP/Gen 200. Theory of International Relations: International System (4)
This course examines the concepts of international structure and system in the field of international relations. It covers the literatures on realism, neorealism, world systems theory, and other system-level explanations of patterns of international conflict and cooperation, continuity and change. Conjoined with Political Science 241.

IP/Gen 201. Theory of International Relations: The Unit in the International System (4)
This course reviews the literature on the role of states and other actors in the international system. Issues to be discussed include the domestic sources of foreign policy and the degree to which changes in the characteristics of the units of a system change the system itself. Conjoined with Political Science 242.

IP/Gen 202. International Political Economy: Money and Finance (4)
Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crises, economic policy coordination, and the role of international lender of last resort. Conjoined with Political Science 262.

IP/Gen 203. The International Political Economy: Trade (4)
This course examines the evolution of the international trading system, emphasizing issues of politics and policy. Topics include developments in the GATT, the emergence of regional trading blocs, protectionism, industrial policy, and the relationship between trade and direct investment. Students choose a particular sector to develop expertise. *Prerequisite: IP/Core 411 or consent of instructor.*

IP/Gen 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.

IP/Gen 205. International Security (4)
Examination of the origins, character, and consequences of fundamental security dilemmas of states and possible means of resolution. Phenomena explored include: causes of war and conditions of peace; arms races; deterrence; balance of power; alliances; security regimes; and current U.S. strategic debate.

IP/Gen 206. The Politics of Democratization (4)
This course will examine the following questions: Why do some countries fail and others succeed in establishing democracies? How do leaders "institutionalize uncertainty"? Should economic or political liberalization come first? Why are there periodic "waves" of democratic breakthrough and breakdown? Conjoined with Political Science 224.

IP/Gen 209. Principles of Marketing (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: IP/Core 401 and 403, or consent of instructor.*

IP/Gen 210. International Politics (4)
Introduction to international politics focusing on the rise and demise of the Cold War. Combines postwar diplomatic history with the core concepts and analytical approaches of international relations. Emphasizes the interplay between structure and strategy.

IP/Gen 211. The Politics of International Economic Relations (4)
The course presents explanations for the political organization of international economic relations in different issue-areas. Additional topics include international economic inequality, efforts by states to manipulate economic relations for strategic gain, and the prospects for regional and global organizations.

IP/Gen 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.

IP/Gen 214. U.S. Strategic Policy Issues in a Changing World (4)
Strategic issues facing the U.S. in the nineties will be described and analyzed. Issues taken up will include nuclear weapons policy, space policy, European and Northeast Asia security policies. Political, military, and technical aspects of these issues will be analyzed. *Prerequisite: graduate status or consent of instructor. Some background in political science and in quantitative analysis of issues desirable.*

IP/Gen 215. United States Foreign Economic Policy (4)
An examination of the main institutional and political factors affecting American foreign economic policy with current theo-

retical debates in international political economy described. Trade policy, monetary policy and macroeconomic coordination, the politics of oil, and foreign direct investment will also be discussed.

IP/Gen 216. Modern Japanese Politics (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.

IP/Gen 217. Models of International Change (4)
The seminar will explore models that account for international change by linking international (systemic or structural) and domestic variables. Particular attention will be given to evolutionary and learning models as they have been employed in a number of disciplines.

IP/Gen 218. Research Seminar on the Pacific Rim (4)
Examination of research strategy formulation. Student papers written for each meeting will raise basic strategic policy questions and propose viable answers. Class evaluation of presented research strategies will investigate alternative methods for examining the underlying questions and proposed solution.

IP/Gen 219A-B-C. Workshop in International Relations (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. Conjoined with Political Science 283A-B-C.

IP/Gen 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 failures occur, and basic topics concerning the aggregate economy.

IP/Gen 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.

IP/Gen 223. Industrial Organization (4)
The interactions among firms and between firms and consumers. How firms compete and collude. The efficiency implications of different market institutions. Public policy toward industry.

IP/Gen 224. Corporate Finance (4)
The topics covered are dividend policy and capital structure, options, debt financing, and short- and long-term in financial planning. Course format will be mostly lectures with occasional cases. Some international aspects of corporate finance will also be discussed.

IP/Gen 225. Comparative Government-Business Relations (4)
Explores the general issue of the interaction between market forces and government, focusing on the mediation between public and private sectors. Examines several principal mediation mechanisms: business associations, consultative bodies, and so on. Proposes a typology for examining the logic of membership and the logic of action of the business community. *Prerequisite: majors only. Additional paper and/or examination will be required at the doctoral level.*

IP/Gen 226. Financial Instruments, Institutions, and Markets (4)
Advanced topics covered include hedging and risk reduction using options contracts, the resolution of differences of opinion, information, and incentives among managers and asset holders with different financial contracts, and the implications for the structure of financial markets. *Prerequisites: IP/Core 421, IP/Gen 434; IP/Gen 422 recommended.*

IP/Gen 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: MPIA level: IRCO 401 and IRCO 403. Ph.D. level: IRGen 221 and IRGen 243.*

IP/Gen 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. *Prerequisite: Additional paper and/or examination will be required at the doctoral level.*

IP/Gen 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.

IP/Gen 232. The Firm in Global Competition (4)
The theory of the gains from international trade is used for understanding current issues in trade policy. Then the viewpoint switches from country to firm: What gives firms an edge in international competition? How does firm organization vary across countries?

IP/Gen 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.

IP/Gen 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.

IP/Gen 235. Advanced Topics in International Trade (4)
Assumes student participants have a background in basic theories of international trade. Introduction to advanced theories and current topics in international trade, including technological transfer between countries, trade patterns between North and South, etc.

IP/Gen 236. Public Finance: Taxation (4)
A survey of taxation theory and institutions. Effect of taxation on efficiency and income distribution. Deficit financing and the burden of the debt. Tax system and structure of the U.S. and other Pacific Rim countries.

IP/Gen 237. Strategy and Planning in Production and Operations Management (4)
This course examines manufacturing, distribution, and service activities that are relevant to the strategic management of operations. It explores the everyday control of operations, the design of the production system, and the interface between operations and other aspects of the firm's overall strategy. *Prerequisite: IP/Gen 238 or consent of instructor.*

IP/Gen 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.

IP/Gen 239. International Manufacturing Strategy: Selected Topics (4)
This course covers selected issues emerging from the recent trends in globalization of firms' manufacturing activities. Topics include globalization of the manufacturing base, international comparison of manufacturing management, and the role of manufacturing in the global competition. *Prerequisite: IP/Gen 238 or consent of instructor.*

IP/Gen 241. Seminar in Advanced Topics in Production and Operations Management (4)
Studies of advanced analytical techniques in operations management. Emphasis is on the application of various analytical methods to operational problems. Students are encouraged to carry out a research project for the actual application of these techniques. *Prerequisite: IP/Gen 238 or consent of instructor.*

IP/Gen 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.

IP/Gen 244. Product Design and Process Development (4)
Engineering management, emphasizing creation and improvement of products and processes. Cases, lectures, and team exercises set in various industries, including software. *Prerequisites: IP/Gen 438 or consent of instructor plus experience in manufacturing, engineering, or software.*

IP/Gen 245. Entrepreneurship (4)
Student teams (3–5) are admitted to the course on the basis of a pro forma business plan. While teams perfect their plans, class discussions cover aspects of creating and planning new businesses, culminating in presentations of their final plans.

IP/Gen 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.

IP/Gen 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 evaluation projects.

IP/Gen 257. Policy 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.

IP/Gen 258. International Environmental Policy (4)
Review of environmental issues, including transboundary air and water pollution, acid rain, ozone depletion, species eradication, whaling, and climate change. Economic, political, and social consequences of international environmental disputes. Current approaches to environmental policy analysis.

IP/Gen 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.

IP/Gen 260. Economic and Social Development of China (4)
traditional Chinese society and economy; geography and resource constraints; impact of the West and Japan; development since 1949; and contemporary problems and options.

IP/Gen 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.

IP/Gen 262. Theories of the Politics and Process of Making Public Policy (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.

IP/Gen 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, 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.

IP/Gen 264. Comparative Economic Development Policy (4)
General theories of economic development, industrialization of developed countries and developing countries, comparison of Asian NIEs and South American NIEs, comparison of Korean economic development and Taiwanese economic development (also of Korea and Japan).

IP/Gen 265. Economy of China (4)
Survey and assessment of China's economic development since 1949. Sections on agriculture; industry; foreign trade; and financial and macroeconomic problems. Economic analysis of the state-dominated mixed economy emerging from current reforms.

IP/Gen 266. Chinese Foreign Policy (4)
Examination of Chinese perceptions of the world, domestic sources of foreign policy, military and security issues, foreign trade, and cultural ties. Relations with the two superpowers will be emphasized. Relations with Japan and the Third World will also be covered.

IP/Gen 267. Policymaking and Political Economy in Japan (4)
The policymaking process in Japan and the interaction and role of state and non-state factors in shaping Japan's economic development. Analysis and comparison, through case studies of industrial policies (toward high-tech and declining industries), and non-industrial policies and their consequences.

IP/Gen 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: IP/Core 401 and 403.*

IP/Gen 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.

IP/Gen 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.

IP/Gen 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 current debate between conventional and heterodox policy packages and their impact on decision making.

IP/Gen 275. Politics and Policy in Latin America (4)
An overview of the contemporary politics in Latin America: democracy, authoritarianism, and revolutionary change. Readings will be mostly comparative, either dealing with groups of countries within Latin America or comparisons between Latin America and other regions of the world.

IP/Gen 276. State and Society in Latin America (4)
Comparative survey of the multiple roles of the state in contemporary Latin America, with special emphasis on the politics of economic policy. Analysis of public policies regarding such problems as agricultural production, incomes and wages, stabilization, investment, and external debt in a variety of political settings: authoritarian, reformist, and revolutionary.

IP/Gen 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.

IP/Gen 278. Mexican Economic Policy (4)
This course offers an overview of economic policy in Mexico. It covers the shift from "stabilizing growth" in the 1950s and 1960s to crisis in the 1970s and 1980s and current reforms. International interactions and current developments are stressed.

IP/Gen 280A-B-C. Graduate Policy Seminar: Comparative Analysis of Political Decision Making (4-4-4)
Three quarter sequence requirement for all doctoral candidates. This course aims to develop theoretical approaches to the study of policymaking in the countries of the Pacific region, including China, Japan, Korea, Taiwan, Hong Kong, Singapore, Latin America, and Canada. The focus is on political institutions and how they structure collective choice and incentives for individual behavior. Participants will research case studies of policymaking and present their findings to the class. As a group, they will also contribute to the process of generating theories about the consequences of different institutional arrangements for policy outcomes.

IP/Gen 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.

IP/Gen 283. Comparative Economic Systems (4)
Economic systems and their transformation in developed and developing countries. Socialism and the transition from central planning to the market. Capitalism and government intervention to foster growth or equity. Coverage may include Russia, Japan, Poland, Sweden, and Brazil.

IP/Gen 284. Korean Politics and Society (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.

IP/Gen 285. The Political Economy of South Korea (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.

IP/Gen 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.

IP/Gen 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.

IP/Gen 299. Independent Research (2-12)
Independent research under the guidance of a faculty member in IR/PS. May be repeated for credit.

Italian Studies

OFFICE: 3071 Humanities and Social Sciences Building, Muir College (CAESAR Office)

Professor

Robert Westman, Ph.D., *History*

Associate Professors

Jack Greenstein, Ph.D., *Visual Arts*
John Marino, Ph.D., *History*
Stephanie Jed, Ph.D., *Italian and Comparative Literature*

Assistant Professors

Pamela Radcliffe, Ph.D., *History*
Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*
Adrienne von Lates, Ph.D., *Visual Arts*

Italian studies is an interdisciplinary program in the language, literature, history, and art of Italy. Italian studies coordinates the resources of

the Departments of History, Literature and Visual Arts, and offers students the opportunity to design a major, leading to a B.A., around the course offerings of these three 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, Venice, 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, and visual arts approved for the program and listed below. Each of the three areas (literature, history, and visual arts) must be represented in the student's program of study, with at least two courses from each field. The particular courses making up each student's major will be selected in consultation with the program adviser. Literature 115 (Medieval Studies) is a required course for all Italian studies majors. In the senior year, each student is required to take a directed readings tutorial (199) and write an essay under the supervision of the chosen instructor.

The Minor Program

A minor in Italian studies consists of six upper-division courses from among those listed below (two each from literature, history, and visual arts). Credit for three courses from the EAP program may be applied toward the minor.

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.

Upper-Division/Italian Studies Courses

For description of courses listed below, see appropriate departmental listing.

Literature

LT/IT 100. Introduction to Italian Literature
LT/IT 110. Selected Topics in Italian Literature (may be repeated for credit as topics vary)
LT/IT 115. Medieval Studies
LT/IT 122. Studies in Modern Italian Culture
LT/IT 136. Studies in Modern Italian Poetry
LT/IT 137. Studies in Modern Italian Prose
LT/IT 161. Advanced Stylistics and Conversation
LT/IT 190. Seminar
LT/IT 198. Directed Group Study
LT/IT 199. Special Studies

N.B.: A prerequisite for all upper-division work in Italian literature, for majors in the Italian Studies Program, is the first- and second-year language sequence (Linguistics/Italian 1A-B-C, Literature/Italian 2A-B, 50).

Visual Arts

123A. Italian Art of the Early Renaissance
123B. High Renaissance Art
123C. Michelangelo
123D. The City in Italy
128C. Topics in Medieval, Renaissance, and Baroque Art (when on an Italian topic)
129C. Special Problems in Medieval, Renaissance, and Baroque Art (when on an Italian topic)

History

120. Early Renaissance Italy: Dante to the Medici (1300-1494)
121. Late Italian Renaissance: Age of Michelangelo (1494-1564)
122. Politics, Italian Renaissance Style
152. Italy Since 1860
199. Independent Study for Undergraduates

Japanese Studies

OFFICE: 3071 Humanities and Social Sciences Building, Muir College

Faculty

Takashi Fujitani, *Associate Professor, History*
Takeo Hoshi, *Associate Professor, International Relations and Pacific Studies*
Germain A. Hoston, *Professor, Political Science*
Hifumi Ito, *Lecturer, Japanese Language*
Noriko Kikuchi, *Lecturer, Japanese Language*
Setsuko Kiyomi, *Lecturer, Japanese Language*
Ellis Krauss, *Professor, International Relations and Pacific Studies*
Sige-Yuki Kuroda, *Professor Emeritus, Linguistics*
Masao Miyoshi, *Hajime Mori Professor of Japanese, English, and Comparative Literature*
Masato Nishimura, *Lecturer, Japanese Language*
Ulrike Schaede, *Assistant Professor, International Relations and Pacific Studies*
Stefan Tanaka, *Associate Professor, History*
Yasu-Hiko Tohsaku, *Associate Professor, International Relations and Pacific Studies*
Christena Turner, *Associate Professor, Sociology*
Lisa Yoneyama, *Assistant 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

1. Japanese language: two years lower-division or the transferred equivalent:
   Japanese Studies 10A-B-C
   Japanese Studies 20A-B-C
2. Lower-division Japanese studies course (one quarter speaker/seminar rotated among the Japanese studies faculty).
3. The remaining two 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.
   c. Thurgood Marshall College students may petition to use DOC courses.
4. 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
2. The remaining six 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. Stduents may include one 199.
   c. Students may include one course on China or Korea.
3. All upper-division courses must be taken for a letter grade.
4. 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 (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 Japanese studies program director.

MINOR

A minor in Japanese studies consists of six courses, at least three of which are upper-division. The courses must be taken in at least two different departments other than language, and approved by the student's college as well as the Program in Japanese Studies. Three quarters of Japanese language courses are required, and may be used to satisfy the minor requirements as lower-division courses. All courses must be taken for a letter grade. One upper-division non-language course taken abroad (EAP or OAP) may be used to satisfy the upper-division requirement.

COURSES

(All graduate-level courses require permission of the instructor for undergraduate students.) (Course titles may vary from year to year.)

HISTORY

HIEA 110. Japan: Through the Twelfth Century

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 160. Colloquium on Modern Japanese History

HIEA 161. Representing Japan

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. Written Japanese
(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.

LINGUISTICS

146. Structure of Japanese

LITERATURE

Lit/Gen 142. 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.)

Lit/Gen 143. 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.)

Lit/Gen 144. A Single Japanese Author (in translation)

Lit/Gen 145. Special Topics in Japanese Literature

Lit/Gen 146. Japanese Literary Works/Writers in Japanese
(When on Japan)

LTGN 189. 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

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

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

188G. Japanese Organizational Culture

GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

IP/Gen 400. International Relations of the Pacific

IP/Gen 469. The Japanese Financial System

IP/Gen 471/271. Japanese Economy

IP/Gen 472/272. Cultures of Japanese Business Organizations

IP/Core 434A-B/270A-B. Modern Japanese Political Economy

IP/Gen 473/273. Japan's Foreign and Defense Policies

IP/Core 473A-D, 474A-D, 475A-D. Japanese Language Maintenance for Professional Proficiency

Judaic Studies

JUDAIC STUDIES OFFICE: 4008 Humanities and Social Sciences Building, Muir College

Professors

Steven Cassedy, Ph.D., *Literature*
David Noel Freedman, Ph.D., *History; Endowed Chair, Biblical Studies*
Richard Elliot Friedman, Th.D., *Hebrew and Comparative Literature; Katzin Chair in Jewish Civilization*
David M. Goodblatt, Ph.D., *History; Endowed Chair in Judaic Studies*
Thomas E. Levy, Ph.D., *Anthropology*
Melford E. Spiro, Ph.D., *Anthropology, Professor Emeritus*

Associate Professors

William H.C. Propp, Ph.D., *History; Coordinator*
Jonathan Saville, Ph.D., *Theatre, Emeritus*
Gershon Shafir, Ph.D., *Sociology*

The Judaic Studies Program is an interdisciplinary program offering courses, majors, minors, and concentrations in Judaic studies which draw upon a variety of perspectives. Courses are offered in the Departments of Anthropology, History, Literature, Political Science, Philosophy, and Sociology.

Major

Requirements for the major in Judaic studies are:

1. Judaic Studies100A-B-C.
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.

Students also have the option within the general literature major in the Department of Literature of concentrating on Judaic literature or on a combined program of Judaic and classical literature.

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.

UCSD students are eligible for participation in the UC Education Abroad Programs in Jerusalem and Haifa.

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.

Judiac Studies 100A-B-C. Introduction to Judaic Studies (4-4-4)
An introductory survey of the history of the Jewish people and Jewish civilization from the Bible to the present day. The approach is multi-disciplinary and addresses social, political, religious, and artistic aspects of Judaic culture.

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.

ANGN 105. Ethnoarchaeology (4)

ANGN 141. Religion and Society (4)

ANRG 116. Archaeology of Society in Syro-Palestine (4)

ANRG 189. Zionism (4)

HIEU 145. European Jewry: 1750-1880 (4)

HINE 100. The Ancient Near East and Israel (4)

HINE 101. Hebrew Prophetic Literature (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 (4)

HINE 108. The Middle East before Islam (4)

HINE 160/260. Special Topics in the Bible and Ancient Near East (4)

HINE 166/266. Nationalism in the Middle East (4)

HINE 170/270. Special Topics in Jewish History (4)

HINE 180. Cultures in Ancient Near East (4)

HINE 181. Problems in Hebrew Manuscripts (4)

HINE 199. Independent Study in Near Eastern History (4)

HITO 100. Religious Traditions: Ancient Near Eastern Religions (4)

HITO 101. Religious Traditions: Judaism, Christianity, Islam (4)

HIGR 260. Seminar in the Hebrew Bible.

HIGR 261A-B-C. Seminar in Judaic Studies (4-4-4)

HIGR 298. Directed Reading (1-12)

HIGR 299. Thesis Direction (1-12)

HIGR 500. Apprentice Teaching (1-40)

Lit/He (Lit/Gen) 148. The Bible and Western Literature (4)

Lit/Gen 149. The Jewish Experience in Literature (4)

Lit/Gen 150. Jewish Mysticism (4)

Lit/Gen 159. A Cultural History of American Jewry (4)

Lit/He (Lit/Gen) 151. Bible: The Prophetic Books (4)

Lit/He (Lit/Gen) 152. Bible: The Narrative Books (4)

Lit/He (Lit/Gen) 153. Bible: The Poetic Books (4)

Lit/He (Lit/Gen) 154. Medieval Hebrew Literature (4)

Lit/He (Lit/Gen) 155. Hebrew Literature: The Modern Period (4)

Lit/He (Lit/Gen) 156. Topics in the Prophets (4)

Lit/He (Lit/Gen) 157. Topics in Biblical Narrative (4)

Lit/He (Lit/Gen) 158. Topics in Biblical Poetry (4)

Lit/Gen 120. Yiddish Literature in Translation (4)

Lit/He 190. Seminars (4)

Lit/Gen 195. Apprentice Teaching (0 and 4)

Courses cross-listed as Lit/He and Lit/Gen may be taken as Hebrew literature by students proficient in the language or as general literature by students without knowledge of Hebrew.

Lit/He 197. Field Study: Archaeology and the Bible (4)
(Offered in Summer Session)

Lit/He 198. Directed Group Study (4)

Lit/He 199. Special Studies (4)

Lit/Co 297. Directed Studies (4)

Lit/Co 298. Special Projects (4)

Philosophy 160. Philosophy of Religion (4-4)

Philosophy 161. Religious Existentialism (4)

Political Science 121A and 121B. Governments and Politics of the Middle East (4-4)

Political Science 121C and 121D. The Arab-Israeli Conflict (4-4)

Sociology/C 156. Sociology of Religion (4)

Sociology/C 157. Religion in Contemporary Society (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 261,
Mail code: 0526,
(619) 534-2536

Professors

Elizabeth Bates, Ph.D., *Cognitive Science, Psychology*
Ursula Bellugi, Ed.D., *Adjunct/Psychology*
Jeff Elman, Ph.D., *Cognitive Science*
Marta Kutas, Ph.D., *Cognitive Science*
David Swinney, Ph.D., *Psychology*

Associate Professor

Mark Kritchevsky, M.D., *Neurosciences*
Carol Padden, Ph.D., *Communications*

Assistant Professors

Adele Goldber, Ph.D., *Linguistics*
Javier Movellan, Ph.D., *Cognitive Science*

The Joint Doctoral Program (approval pending, spring 1996)

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. Backgrounds 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. Applications must be received by February 15 to be considered for the doctoral program beginning in the following fall semester/quarter. All other supporting materials must be received by April 1. Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University.

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

Ethics and Survival Skills in Academe
Cognitive Science 241

Neuroanatomy and Neurophysiology
Cognitive Science 201A or
(Neurosciences 253 and 262)

Language: Basic Structures and Concepts
Cognitive Science 201D or
(Linguistics 221A and 211A)

Foundations Requirement:

Normal Language and Cognition in Adults
Psychology 244

Language Disorders in Adults
Cognitive Science 251 or Psychology 245

Development of Normal Language and Cognition in Children
Psychology 215

Electives:

Cognitive Science
201F: Foundations: Neural Networks
201G: Cognitive Neuroscience
204A-B: Research Methods in Cognitive Science
213: Issues in Cognitive Development
260: Parallel Distributed Processing and Natural Language Processing
272: Topics in Theoretical Biology
273: Biological Basis of Attention
279: Electrophysiology of Cognition

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: Modern Childhood

Linguistics
211A: Introductory Phonology[1]
214: Topics in Phonetics
221: Introductory Syntax[1]
225: Topics in Syntax
249: Topics in Sign Languages of the Deaf
272: Language and the Brain

Psychology
202: Sensory Mechanisms
203: Physiological Psychology
218AB: Cognitive Psychology
222: Brain Functions
225: The Development of Speech Perception
227: Cognitive Development
230: Brain, Cognition & Development
235: Cognitive Psychophysiology
236: Neural Plasticity and Regeneration
242A-B-C: Research Topics in Developmental Psychology
244: Special Topics in Psycholinguistics
252: Seminar on Cognitive Neuroscience

Computer Science and Engineering
278AB: Advanced Artificial Intelligence
281P: Connectionist Models and Cognitive Processes
281W: Natural Language Processing

Neurosciences:
243: Physiological Basis of Human Information
246: Advanced Neuroanatomy[1]
252: Information Processing in Man
253: Clinical Neuroanatomy
258 Molecular and Cellular Neurobiology
262: Neurophysiology
263: Developmental Neurobiology
274: Neurobiology of Cognitive Developmental Disorders
277: Clinical Neurosciences

[1]Students who use this course to fulfill the Tools requirement may not use this as an elective.

Latin American Studies

Office:
1 Gildred Latin American Studies Building
Institute of the Americas Complex

Professors

Carlos Blanco, Ph.D., *Literature (emeritus)*
Rae Blumberg, Ph.D., *Sociology*
Charles Briggs, Ph.D., *Ethnic Studies*
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*
Joseph Grunwald, Ph.D., *Economics (Adjunct, Emeritus)*
Ramón Gutiérrez, Ph.D., *Ethnic Studies*
Stephan Haggard, Ph.D., *International Relations and Pacific Studies*
Dee Dee Halleck, Ph.D., *Communication*
Daniel Hallin, Ph.D., *Communication*
Jorge Huerta, Ph.D., *Theatre*
Rosaura Sánchez, Ph.D., *Literature*
Peter H. Smith, Ph.D., *Political Science (Program Director)*
Eric Van Young, Ph.D., *History*
Carlos Waisman, Ph.D., *Sociology*

Associate Professors

Dain Borges, Ph.D., *History*
Ann Craig, Ph.D., *Political Science*
Luis Guasch, Ph.D., *Economics*
David Gutiérrez, Ph.D., *History*
James Holston, Ph.D., *Anthropology*
Christine Hunefeldt, Ph.D., *History*
David Mares, Ph.D., *Political Science*
George Mariscal, Ph.D., *Literature*
Michael Monteón, Ph.D., *History*
James Rauch, Ph.D., *Economics*
Marta Sánchez, Ph.D., *Literature*
Matthew Shugart, Ph.D., *International Relations and Pacific Studies*
Kathryn Woolard, Ph.D., *Sociology*
León Zamosc, Ph.D., *Sociology*

Assistant Professors

Paule Cruz-Takash, Ph.D., *Ethnic Studies*
John Moore, Ph.D., *Linguistics*
Max Parra, Ph.D., *Literature*
Ricardo Stanton-Sálazar, Ph.D., *Sociology*

Olga Vásquez, Ph.D., *Communication*
Christopher Woodruff, Ph.D., *International Relations and Pacific Studies*

Lecturers

Claudio Fenner-Lopez, M.A., *Visual Arts*
Beatrice Pita, Ph.D., *Literature*

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 200 Latin America-related courses in fourteen academic departments, and the Latin American Studies Program now offers three interdisciplinary degrees:

- bachelor of arts in Latin American Studies,
- minor in Latin American Studies, and a
- master of arts in Latin American Studies.

Planning is also under way for creation of a joint master's program in Pacific International Affairs and 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.
- 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.

For such reasons, UCSD is one of twelve federally-designated National Resource Centers for Latin American Studies. In reflection of its prominence, the UCSD program also receives external funding from such prestigious institutions as the Ford Foundation, the Andrew W. Mellon Foundation, the William and Flora Hewlett Foundation, and the Tinker Foundation.

The Curricular Programs

Degree programs in Latin American Studies are supervised by an interdisciplinary faculty group under the chairmanship of the director of Latin American Studies. Students in Latin American Studies are encouraged to participate in the Education Abroad Program (EAP) in Brazil, Chile, Costa Rica, or Mexico; by petition, credits earned through EAP can fulfill UCSD's degree requirements.

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 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. 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 from UCSD's interdisciplinary offerings (see list of approved courses below). They must also demonstrate proficiency in Spanish. Students are encouraged to complete the lower-division prerequisites before they enroll in upper-division courses.

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.

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 America 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 by examination are strongly encouraged to study Portuguese.
2. Latin American Studies 50.

UPPER-DIVISION REQUIREMENTS

Eleven upper-division courses selected, with the approval of the director of Latin American Studies, from a designated list of Latin American studies courses offered in the humanities or social sciences. Students must take course work in at least three departments; and they must take at least three courses, but no more than five, from one department. At least two of the eleven courses must concentrate exclusively on periods earlier than the twentieth century. 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.

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. With the sole exception of LATI 199, all courses must be taken for a letter grade.

Honors in Latin American Studies

Individuals who wish to pursue Honors in Latin American Studies, as distinct from the regular major, must complete nine upper-division courses from at least three departments,

with no more than five courses from any single department and with at least two courses on material prior to the twentieth century. Honors students also take a three-quarter sequence during the senior year that will culminate in the presentation and defense of an original thesis based on primary research (usually between 50 and 100 pages in length), and they must maintain a minimum GPA in the major of 3.5.

In summary, to receive Honors, students must:

1. satisfy all lower-division requirements of the major program;
2. complete nine upper-division courses;
3. complete a three-course sequence 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; three 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.

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 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. complete forty units of course work (ten courses) in at least three fields, with no more than sixteen units in any one department, and four of those units must be taken in the Latin American Studies Core Seminar (LATI 200); and
3. successfully complete either a comprehensive exam or master's thesis.

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 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 298. Directed Reading (4)
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.*

The following is a partial list of courses available in UCSD departments that are approved to satisfy the requirements of the minor, major, and master of arts in Latin American Studies. Language courses in Spanish and Portuguese are offered by the departments of Linguistics and Literature, and by the Graduate School of International Relations and Pacific Studies.

Anthropology

ANRG 90: Undergraduate Seminar: Archaeology of Central Mexico

ANRG 90: Undergraduate Seminar: Mayan Archaeology

ANRG 102: Latin American Societies & Cultures

ANRG 126: Rise of New World Civilizations: Mesoamerica & the Andes

ANRG 133: Politics & Modernity: Urban Cultures in Latin America

ANRG 134: The Cultures of Mexico

Communication

COM/GEN 175: Cinema in Latin America: Visions of a Continent in Transition

Economics

ECON 161: Latin American Economic Development

Ethnic Studies

ETHN 131: Hispanic American Dramatic Literature

ETHN 180: Topics in Mexican-American History

History

HILA 100: Latin American Colonial Transformation

HILA 101: Latin American Independence, 1810–1898

HILA 102: Latin America/Twentieth Century

HILA 105: South America: Labor, Coercion, & Society

HILA 110: Progress & Poverty in South America, 1820–1930

HILA 111: Progress & Poverty in South America, 1930–present

HILA 112: Economic & Social History of the Andean Region

HILA 113: Lord & Peasant in Latin America

HILA 114: Social History/Colonial Latin America

HILA 115: Latin American City, A History

HILA 116: Encounter of Two Worlds/Colonial Latin America

HILA 117: Indians, Blacks, Whites: Family Relations in Latin America

HILA 120: History of Argentina

HILA 121: History of Brazil

HILA 122: Cuba: From Colony to Socialist Republic

HILA 131: History of Mexico: 1821–1924

HILA 132: History of Contemporary Mexico

HILA 160: Topics in Latin American Colonial History

HILA 161: History of Women in Latin America

HILA 162: Special Topics in Latin American History

HILA 164: Political Economy of Argentina

HILA 166: Cuba: From Colony to Socialist Republic

HILA 170: Topics in Latin American History, 1820–1910

HILA 171: Special Topics in Latin American History since 1910

HILA 172: Machismo and Matriarchy: The Latin American Social Structure

HIGR 245ABC: Seminar in the Literature of Latin American History

HIGR 246ABC: History of Mexico

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

IRPS 278: Mexican Economic Policy

IRPS 438: State & Society in Latin America

IRPS 439: Economic Policy in Latin America

IRPS 440: Politics and Policy in Latin America

IRPS 474: Latin American Societies: Social Class & State Policies

IRPS 475: State and Society in Latin America

IRPS 477: Latin American Politics

IRPS 478: Mexican Economic Policy

IRPS 479: Regime Change in Latin America

IRPS 480: Health Policy Development in Mexico

Latin American Studies

LATI 50: Introduction to Latin America

LATI 190: Senior Seminar/Latin American Studies

LATI 191: Honors Thesis Seminar/Latin American Studies

LATI 199: Independent Study/Latin American Studies

LATI 200: Core Seminar in Latin American Studies

Literature

LTSP 130B: Development/Latin American Literature

LTSP 131: Spanish American Literature: Colonial Period

LTSP 132: Spanish American Literature: Nineteenth Century

LTSP 133: Spanish American Literature: Twentieth Century

LTSP 134: Argentine Literature: Borges & Cortazar

LTSP 135: Mexican Literature: Narrative & Peasant Revolts

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 Essay

LTSP 144: Spanish American Theatre

LTSP 163: Spanish Language in the Americas

LTSP 165: History of the Spanish Language

LTSP 171: Literature & National Integration in Mexico

LTSP 172: Indigenista Themes in Spanish American Literature

LTSP 173: Problems in Spanish & Spanish American Literary History

LTSP 258: Spanish American Prose

LTSP 259: Spanish American Poetry

LTSP 272: Literature and Society Studies

Political Science

POLI 134AA-AB: Comparative Politics of Latin America

POLI 134B: Politics in Mexico

POLI 134C: Politics in Mexico: Research Seminar

POLI1 34D: Selected Topics in Latin American Politics

POLI 134G: Politics in the Andes

POLI 134I: Politics: Southern Cone of Latin America

POLI 134N: Politics in Central America

POLI 134P: Organizing Women in Latin America

POLI 134R: Political Parties in Latin America

POLI 134Q: Organization, Resistance, & Protest in Latin America

POLI 146A: US & Latin America: Political & Economic Relations

POLI 230AB: The Mexican Political System

POLI 235A: Latin American Politics

POLI 235B: Regime Transformation in Latin America

POLI 236: Immigration Policy and Politics

POLI 237: Grassroots Organization and Political Change

Sociology

SocC 180: Social Movements & Social Protest

SocD 188D: Latin America: Society & Politics

SocG 248: Latin American Societies: Social Classes and State Policies

Theatre

THHS 4: Introduction to Contemporary Chicano Theatre

THHS 110: Chicano Dramatic Literature

THHS 111: Hispanic-American Dramatic Literature

THGR 268: Latin American Dramatic Literature

THGR 269: U.S.-Latino Dramatic Literature

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, history, philosophy, political science, psychology, sociology, urban studies and planning, and women's 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 (forms officially designating law and society a minor and listing the specific course

work selected by the student) and petitions (forms requesting changes and/or exceptions from course requirements) for the law and society minor 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.

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.

Law and Society Minor Requirements

The minor consists of six courses. 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.

The law and society minor is applicable as a Warren College program of concentration in the social sciences.

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 140C–Sociology of Law

TWO ELECTIVES CHOSEN FROM THE FOLLOWING:

Communication/SF

139A-B–Law, Communication, and Freedom of Expression

Dimensions of Culture

2–Justice (open to Marshall College students)

Economics

118A-B–Law and Economics

Environmental Studies

110-Environmental Law

History U.S.

152–The Trials of America
153–American Political Trials
169–American Legal and Constitutional History

Philosophy

12–Logic and Decision Making
162–Contemporary Moral Issues
163–Bio-Medical Ethics
165–Professional Ethics
167–Contemporary Political Philosophy

Political Science

102H–Political and Legal Foundations of the American Economy
104F–Constitutional Law Seminar
104I–Law and Politics–Courts and Political Controversy
105A–Comparative Legal Cultures

Psychology

162–Psychology and the Law

Sociology

141/C–Crime and Society
142/B–Social Deviance
144/C–Forms of Social Control

Urban Studies and Planning

124–Land Use Planning

Women's Studies

102–Selected Topics in Women's Studies: Women and the Law

Students may petition to substitute courses in the minor that have substantial legal content. Petitions should be submitted to the Interdisciplinary Programs Office, Literature Building, Second Floor, Room 3238, Warren College.

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. *Prerequisite: Political Science 40 or consent of instructor. May be repeated for credit once, for a maximum total of eight units.*

Linguistics

OFFICE: 2125 McGill Hall, Muir College

Professors

Matthew Y. Chen, Ph.D., *Chair*
Ronald W. Langacker, Ph.D.
David M. Perlmutter, Ph.D.

Associate Professors

Farrell Ackerman, Ph.D.

Assistant Professors

Chris Barker, Ph.D.
Adele Goldberg, Ph.D.
Kathleen Hubbard, Ph.D.
Robert Kluender, Ph.D.
John Moore, Ph.D.

Professors Emeritus

Edward S. Klima, Ph.D.
S.-Y. Kuroda, Ph.D.
Margaret Langdon, Ph.D.
Leonard 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 (psycholin-guistics) and brain (neurolinguistics). Language can also be studied in terms of its function as a cognitive system shared by an entire society; sociolinguistics investigates 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 include Linguistics 3 (Language as a Social and Cultural Phenomenon), 4 (Language as a Cognitive System), 6 (Language and Human History), 7 (Sign Language and Its Culture), and 10 (Introduction to General Linguistics). These courses may be used to satisfy the Marshall College disciplinary breadth requirement. Linguistics 3, 4, 6, and 7 satisfy the social sciences requirement at Muir College; Linguistics 3, 4, and 10 satisfy the Revelle College social sciences requirement. Linguistics 7 satisfies the Revelle American Cultures requirement. Linguistics 3, 4, and 10- partially fulfill a Warren College program of concentration requirement.

The study of linguistics 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) 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 Department of Linguistics oversees the Linguistics Language Program, which offers elementary instruction in French, German, Italian, and Spanish. Courses from the Language Program satisfy general education requirements, as well as the linquistics language requirement. In addition, directed self-instruction is available for a wide variety of languages through Linguistics 19.

The Major Program

General Requirements

Every linguistics major must satisfy the undergraduate language requirement and must successfully complete a minimum of twelve upper-division courses, including five 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 Linguistics 198 or 199, no course taken on a Pass/Not Pass basis may be counted toward a linguistics major. No more than one quarter of Ling/Gen 198 or 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 10 is strongly recommended to prospective majors as an introduction to the field. The course serves as a prerequisite to Linguistics 120 and 121.

Every major program in linguistics must include the following required courses covering basic areas of the field:

Ling/Gen 110: Phonetics

Ling/Gen 111: Phonology I

Ling/Gen 120: Morphology

Ling/Gen 121: Syntax I

Ling/Gen 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.

Please note that Linguistics 110 is the prerequisite for Linguistics 111 and is one way of satisfying the prerequisite for Linguistics 120. Check individual course listings for prerequisite information.

Core Linguistics Electives

Linguistics courses with course numbers between 110 and 159 are considered core area courses. The following courses are approved core electives for the linguistics major (Ling/Gen 114, 141, 143, and 151 may be repeated for credit when topics vary, each repetition counting toward the major):

Ling/Gen 114: Topics in Phonetics

Ling/Gen 115: Phonology II

Ling/Gen 123: Morphology II

Ling/Gen 125: Syntax II

Ling/Gen 141: Language Structures

Ling/Gen 142: Language Typology

Ling/Gen 143: Romance Linguistics

Ling/Gen 150: Historical Linguistics

Ling/Gen 151: Language History

Other Linguistics Electives

Ling/Gen 104: Concepts and Categories

Ling/Gen 160: Mathematical Background in Formal Linguistics

Ling/Gen 163: Computational Linguistics

Ling/Gen 170: Psycholinguistics

Ling/Gen 171: Child Language Acquisition

Ling/Gen 172: Language and the Brain

Ling/Gen 173: Language and Consciousness

Ling/Gen 175: Sociolinguistics

Ling/Gen 176: The Language of Persuasion

Ling/Gen 177: Multilingualism

Ling/Gen 178: Second Language Teaching Methodology

Restricted Courses

Ling/Gen 195: Apprentice Teaching (does not count as a linguistics elective)

Ling/Gen 198: Directed Group Study in Linguistics

Ling/Gen 199: Independent Study in Linguistics

Ling/Gen 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 and must in addition successfully complete the equivalent of three quarters of foreign language instruction (based on standard four- or five-unit courses).

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.

The three additional quarters of foreign language instruction may be in a single language or some combination of languages. The language in which proficiency was demonstrated is not excluded, provided that any additional courses in that language are beyond the fourth-quarter level and are more advanced than any course taken to demonstrate proficiency.

Students are encouraged to satisfy this requirement as early as possible in order to be able to use the languages 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

The general major in linguistics requires satisfaction of the undergraduate language requirement and successful completion of twelve upper-division courses:

5 required linguistics courses

3 core linguistics electives

2 linguistics electives (core or other)

2 additional linguistics electives (core or other) or upper-division courses in other departments pertaining to the study of language

Specialized Majors

Every student with a specialized major must consult the appropriate 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 a total of fourteen courses as specified below. Of the courses counted towards the specialized major, at least twelve must be upper-division. To recognize the additional courses required for specialized majors, specialization will be reflected in the wording of a degree, e.g., "B.A. in Linguistics (with Specialization in Language and Society)."

Linguistics with Concentration in a Particular Language

5 required linguistics courses

Ling/Gen 141: Language Structures or
Ling/Gen 143: Romance Linguistics

3 upper-division courses taught in the language of concentration, selected in consultation with the faculty adviser for this specialization

5 linguistics electives (core or other). Courses particularly relevant to this specialization are:

Ling/Gen 141: Language Structures (may be repeated as topics vary)
Ling/Gen 143: Romance Linguistics (may be repeated as topics vary)
Ling/Gen 150: Historical Linguistics
Ling/Gen 151: Language History (may be repeated as topics vary)
Ling/Gen 177: Multilingualism
Ling/Gen 178: Second Language Teaching Methodology

Language and Mind

5 required linguistics courses

2 core linguistics electives

3 courses related to language and cogni-

tion, which may include courses from other departments, selected in consultation with the faculty adviser for language and mind

4 linguistics electives (core or other). Courses particularly relevant to this specialization are:

Ling/Gen 104: Concepts and Categories
Ling/Gen 170: Psycholinguistics
Ling/Gen 171: Child Language Acquisition
Ling/Gen 172: Language and the Brain
Ling/Gen 173: Language and Consciousness
Ling/Gen 176: The Language of Persuasion

Language and Society

5 required linguistics courses

2 core linguistics electives

3 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 (core or other). Courses particularly relevant to this specialization are:

Ling/Gen 175: Sociolinguistics
Ling/Gen 176: The Language of Persuasion
Ling/Gen 177: Multilingualism

English as a Second Language

5 required linguistics courses

2 core linguistics electives

3 upper-division courses in the Teacher Education Program

4 linguistics courses (core or other). Courses particularly relevant for this specialization are:

Ling/Gen 175: Sociolinguistics
Ling/Gen 177: Multilingualism
Ling/Gen 178: Second Language Teaching Methodology

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 major, and further requires one quarter of Ling/Gen 199H during which an honors paper is written. Responsibility for arranging the honors independent study with a professor 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 directed group study in linguistics (Ling/Gen 198) or independent study in linguistics (Ling/Gen 199). No more than one such course (to be taken Pass/Not Pass) may count toward the major.

The Minor Program

Eleanor Roosevelt, Muir, and Thurgood Marshall: The linguistics minor consists of six courses: Ling/Gen 10, 110, 111, 120, and 121, plus one additional upper-division course in linguistics.

Revelle: For Revelle College only, the linguistics minor consists of six courses including Ling/Gen 110, 120, and one additional upper-division course in linguistics. Two of the remaining minor courses must be upper-division courses relevant to the study of language but may be taken in departments other than linguistics: for instance, the Departments of Mathematics, Computer Science and Engineering, Philosophy, Psychology, Anthropology, Sociology, Communication, Cognitive Science, or Literature. These courses must form a coherent program of study. The courses to complete the minor are selected in consultation with the departmental undergraduate adviser. The content of these courses will determine whether the linguistics minor is classified as humanities, natural science, or social science.

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 Ling/Gen 198 or 199. Only one quarter of Ling/Gen 198 or 199 may be counted toward the minor.

Warren Program of Concentration: Three lower-division courses: must include Ling/Gen 10 and/or Ling/Gen 3 and Ling/Gen 4, plus three upper-division courses.

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, feature geometry, 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, Chinese, Finno-Ugric, Germanic, Persian, Romance, 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 two languages other than English). The department has a tradition of working with local Native American communities in the documentation and preservation of their languages, and since Southern California is home to a large number of immigrant minorities, native speakers of a wide variety of other languages are readily accessible. The department's language laboratory maintains a library of written and recorded materials permitting independent study of dozens of common and exotic 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), 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 are encouraged to 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 Ling/Gen 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 (a) either French or German, and of (b) any other language except English, 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 nine courses. These are:

- three courses in phonetics/phonology: 211A, 211B, and one course from among 212, 213, 214, and 215
- two courses in formal grammatical theory: 221A and 221B
- two courses in cognitive and functional grammatical theory: 221C and 221D
- one course in formal semantics: 230
- one course in field methods: 240

Sometime in the third year, Ph.D. students will choose an area of specialization within linguistic theory, either phonetics/phonology or syntax/semantics.

Students who choose phonetics/phonology as an area of specialization have the following **additional** course requirements:

- any two courses from among the following, including repetitions of the same course when topics vary: 212, 213, 214, and 215
- one course from among the following: 222A, 224, 231, 235, 240, or 241

Students who choose syntax/semantics as an area of specialization have the following **additional** course requirements:

- 224
- one course from among the following: 222A, 231, or 235
- one course from among the following, including repetitions of the same course when topics vary: 212, 213, 214, 215, 240, or 241

All required courses 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 fifth 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 eighth 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.

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 typed 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. may be granted the M.A. in linguistics after: 1) satisfactorily completing twelve courses taken for a letter grade. These must include the common core of nine courses; 2) passing the comprehensive evaluation at the end of the fifth 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

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.

6. Language and Human History (4)
The genetic relationships among the world's languages and their contribution to the understanding of history. Other topics include: criteria for language families, the contributions of nineteenth-century linguistics, and views of language and language families that emerged from the study of Native American languages.

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.

10. Introduction to General Linguistics (4)
A general introduction to linguistics. Focuses on the core areas of linguistics, including the production and organization of speech sounds (phonetics/phonology), the structure of words (morphology), the structure of sentences (syntax), and aspects of meaning (semantics).

UPPER-DIVISION

104. Concepts and Categories (4)
An interdisciplinary approach to the analysis of human categorization, drawing on evidence from linguistics, psychology, artificial intelligence, and philosophy. Topics include prototype theory, frame semantics, and metaphor.

110. Phonetics (4)
Basic anatomy and physiology of the mechanisms used in speech. Acoustic phonetics and speech perception. Transcription and production. Introduction to phonological feature systems.

111. Phonology I (4)
Examination of phonological structures of natural languages. Exercises in phonological description. The empirical justification of phonological analyses. *Prerequisite: Ling/Gen 110.*

114. Topics in Phonetics (4)
Topcis in phonetic sciences. Subjects will vary, and may include acoustic, articulatory, and perceptual studies. In addition to readings and lectures, students may use laboratory facilities to investigate specific questions. May be repeated for credit when topics vary. *Prerequisite: Ling/Gen 110 or consent of instructor.*

115. Phonology II (4)
Current theoretical approaches to the sound structure of languages. *Prerequisite: Ling/Gen 111.*

120. Morphology (4)
Basic introduction to lexical, morphological, and syntactic structure. The course surveys representative lexical and grammatical phenomena drawn from a variety of typologically and genetically distinct languages of the world. Concepts and techniques for the analysis of lexical and grammatical structure are learned through problem solving exercises that apply them to actual language data. *Prerequisite: Ling/Gen 10, 110, or consent of instructor.*

121. Syntax I (4)
Introduction to the syntax of natural languages, with special reference to English. The empirical justification of syntactic analyses. Emphasis on problem solving and argumentation. *Prerequisite: Ling/Gen 10 or consent of instructor.*

123. Morphology II (4)
Recent developments in morphological theory, with special reference to the interface between morphology and syntax and/or phonology. An illustrative list of issues includes: cyclic effects, non-derived environment blocking, bracket erasure, non-concatenative morphology; item-and-arrangement vs. realizational approaches to morphology.

125. Syntax II (4)
Topics in the syntax of English and other languages. Syntactic theory and universals. *Prerequisite: Ling/Gen 121.*

130. Semantics (4)
Introduction to the study of meaning. Survey of approaches to the analysis and description of semantic structure. Formal semantics and its application to natural language.

141. Language Structures (4)
Detailed investigation of the structure of one or more languages. May be repeated for credit as topics vary. *Prerequisite: Ling/Gen 10, 110, or consent of instructor.*

142. Language Typology (4)
The systematic ways languages differ. Cross-linguistic studies of specified topics (e.g., word order, agreement, case, switch reference, phonological systems and rule types, etc.) in an effort to develop models of language variation.

143. Romance Linguistics (4)
Topics concerning the history or structure of the Romance languages. A survey of major syntactic, semantic, or phonological processes in one or more of these languages. Languages to be investigated include French, Spanish, Portuguese, and Italian. May be repeated for credit as topics vary. *Prerequisite: Ling/Gen 10, 110, or consent of instructor.*

150. 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. *Prerequisite: Ling/Gen 111.*

151. Language History (4)
Examination of the historical development of one language or a group of related languages. May be repeated for credit as topics vary.

160. Mathematical Background in Formal Linguistics (4)
Mathematical foundations of the formal study of natural language syntax and semantics. Topics include elements of formal logic, formal grammars and automata.

163. Computational Linguistics (4)
Topics may include: parsing theory; computational models of grammar; software tools for speech recognition and language analysis. Programming experience helpful but not required. Coursework will involve interaction with computers.

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.

171. Child Language Acquisition (4)
The study of first language acquisition viewed from the perspective of descriptive and theoretical research in linguistics. An emphasis on integrating issues relevant to human development and cognitive science.

172. Language and the Brain (4)
The mind/body problem, basic neuroanatomy and neurophysiology, cerebral lateralization, origins and evolution of language, aphasia and dyslexia, and neural imaging studies of language: electrical stimulation, positron emission tomography (PET), functional magnetic resonance imaging (fMRI), and event-related potentials (ERPs).

173. Language and Consciousness (4)
Language and how it influences our perception of the world; the Whorf-Sapir hypothesis. The role of metaphor in human conceptualization and language. The role of language in myth, ritual, religion, and altered states of consciousness.

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.

176. The Language of Persuasion (4)
An examination of the ways in which linguistic pragmatics, logic, and results in descriptive and theoretical linguistics can be employed to provide insight into the uses of language in politics, the law, and advertising.

177. Multilingualism (4)
The critical period, the processing and neural representation of language in bilinguals, theories of second language acquisition and creolization, official and minority languages, language planing, bilingual education and literacy, code switching, and language attrition.

178. Second Language Teaching Methodology (4)
The history of second language teaching methodology, current methods, and empirical studies of methodological issues.

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. *Prerequisites: consent of instructor, advanced standing.*

198. Directed Group Study in Linguistics (2 or 4)
Study of specific language structures or linguistic topics not covered in regular course work, under the direction of a faculty member in the Department of Linguistics. (P/NP grades only.) *Prerequisite: consent of instructor. May be repeated for credit.*

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: Ling/Gen 110 or equivalent.*

211A. Introductory Phonology (4)
This introductory course serves a dual purpose: (a) to insure that all beginning students master the core concepts and techniques of phonological description, and (b) to familiarize them with the basics of autosegmental phonology under two main subheadings: the tonal tier and the CV/skeletal tier.

211B. Nonlinear Phonology (4)
In this course students will learn the basic theoretical and empirical motivations for three major representational theories of nonlinear phonology: (a) feature geometry and underspecification, (b) syllable theory, and (c) metrical theory. In addition, the relationship between phonology and morphology will be discussed in terms of lexical phonology. *Prerequisite: Ling/Gen 211A or equivalent.*

212. Theories of Phonology (4)
Current theoretical approaches: one particular approach is explored in a given quarter. May be repeated for credit when topics vary.

213. Issues in Phonology (4)
Current theoretical issues. May be repeated for credit when topics vary.

214. Topics in Phonetics (4)
Advanced topics in phonetic sciences. Subjects will vary, and may include speech perception, acoustic phonetics, articulatory phonetics. May be repeated for credit when topics vary. *Prerequisite: Ling/Gen 210.*

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)
Foundations of syntactic theory. The notion of explicit hypotheses, argumentation, and basic results of generative grammar. Introduction to Principles and Parameters Theory through the analysis of English data, concentrating on Theta, X-bar, Government, Case, and Control Theories.

221B. Introduction to Grammatical Theory (4)
Continued development of Principles and Parameters Theory, concentrating on wh-movement and the Binding Theory. Focus on testing theoretical proposals and understanding the role of theoretical alternatives, underlying assumptions, and the empirical results upon which these are based.

221C. Introduction to Grammatical Theory (4)
Introduction to cognitive and functional theories of linguistic structure. Examination of fundamental concepts and theoretical issues. Discussion of the methodology and basic findings of functional research.

221D. Introduction to Grammatical Theory (4)
Cognitive approaches to semantic, lexical, and grammatical structure. Basic principles of cognitive linguistic theories. Application to the description of representative structural phenomena.

222A-B. Theories of Grammar (4-4)
Introduction to a particular grammatical theory. May be repeated for credit when topics vary.

223. Issues in Syntax (4)
Current theoretical issues. May be repeated for credit when topics vary.

224. Lexicalist Theories of Grammar (4)
Introduction to the role of the lexicon in the explanation of syntactic phenomena. Investigation into the nature of lexical representations and their relation to the morphology/syntax interface.

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. 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.

231. Cognitive Semantics (4)
Introduction to conceptualist accounts of semantic structure. Survey of basic phenomena, including frames, metaphor, metonymy, construal, categorization, image schemas, and mental space organization. Examination of selected descriptive and theoretical proposals.

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.

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: Ling/Gen 110 or equivalent.*

241. Fieldwork (4)
Fieldwork continuing the research of the previous quarter; student-directed elicitations on topics of interest. *Prerequisite: Ling/Gen 240.*

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 as topics vary.

250. 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.

270. Psycholinguistics (4)
The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

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)
Investigation of methods of teaching foreign languages and the theories of language acquisition on which they are based.

290. Current Issues in Linguistic Theory (4)
Discussion of selected current issues: theoretical formulations, their predictions, and how relevant data can be brought to bear on them. Since the topics will change, this course may be repeated for credit.

292. Topics in Research in Progress (0-4)
Presentation and discussion of research in progress. May be repeated.

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

294. Professional Development (0-2)
Skills, techniques, issues, and principles relevant to graduate education and successful transition to a professional career. (S/U grades only.) May be repeated for credit.

296. Directed Research (1-8)
Individual research. May be repeated for credit.

297. Field Research (1-8)
Linguistic analysis of language in the field. May be repeated for credit.

298. Directed Group Study (0-2)
Study of topics outside the scope of regular course work, under the direction of a faculty member. (S/U grades only.) 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.*

500. Apprentice Teaching of Language (1-4)
The course, designed for graduate students serving as language 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.

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 Ling/Gen course to receive credit.

COURSES

LANGUAGE

OFFICE: Linguistics Language Program Office, 2125 McGill Hall, Muir College

Students are placed in foreign language courses based on prior preparation and 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.

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 group grammar discussion sections led by a linguist, assigned laboratory work, and outside reading. Each course in the 1A-1B-1C-1D series must be taken concurrently with the corresponding course in the 1Ax-1Bx-1Cx-1Dx series.

Linguistics 11 courses are self-instructional: intended for learning the language to read it 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. Depending on the availability of suitable materials, students may enroll for two or four units of credit. For some languages, the course may be repeated for credit.

CHINESE

See: **Chinese Studies**

See also: **Linguistics Directed Study**

FRENCH

Linguistics/French (LIFR) 1A. French Conversation (2.5)
Small tutorial meetings with a native speaker of French. Must be taken in conjunction with LIFR 1Ax. *Prerequisite: no prior study of French required.*

Linguistics/French (LIFR) 1Ax. Analysis of French (2.5)
An introduction to the academic study of French, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with LIFR 1A. *Prerequisite: no prior study of French required.*

Linguistics/French (LIFR) 1B. French Conversation (2.5)
Small tutorial meetings with a native speaker of French. 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)
Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken 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 tutorial meetings with a native speaker of French. 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)
Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken 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 tutorial meetings with a native speaker of French. Must be taken in conjunction with LIFR 1Dx. *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)
Review and refinement of phonological, morphological, and syntactic elements of French and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with LIFR 1D. *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)

Linguistics/French (LIFR) 15, 16, and 17. Intermediate French for the Social Sciences (2)
Conducted entirely in French. 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. 15 is offered fall quarter only, 16 is offered winter quarter only and 17 is offered spring quarter only. Each course may be taken one time and need not be taken in sequence. *Prerequisite: 1D/Dx or at least three semesters/four quarters of college French or by permission of the instructor.*

See also: **Department of Literature**

GERMAN

Lingusitics/German (LIGM) 1A. German Conversation (2.5)
Small tutorial meetings with a native speaker of German. Must be taken in conjunction with LIGM 1Ax. *Prerequisite: no prior study of German required.*

Lingusitics/German (LIGM) 1Ax. Analysis of German (2.5)
An introduction to the academic study of German, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with LIGM 1A. *Prerequisite: no prior study of German required.*

Lingusitics/German (LIGM) 1B. German Conversation (2.5)
Small tutorial meetings with a native speaker of German. 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.*

Lingusitics/German (LIGM) 1Bx. Analysis of German (2.5)
Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. 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.*

Lingusitics/German (LIGM) 1C. German Conversation (2.5)
Small tutorial meetings with a native speaker of German. 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.*

Lingusitics/German (LIGM) 1Cx. Analysis of German (2.5)
Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. 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.*

Lingusitics/German (LIGM) 1D. German Conversation (2.5)
Small tutorial meetings with a native speaker of German. Must be taken in conjunction with LIGM 1Dx. *Prerequisites: LIGM 1C with a grade of C– or better, or equivalent and LIGM 1Cx with a grade of D or better, or equivalent.*

Lingusitics/German (LIGM) 1Dx. Analysis of German (2.5)
Review and refinement of phonological, morphological, and syntactic elements of German and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with LIGM 1D. *Prerequisites: LIGM 1C with a grade of C– or better, or equivalent, and LIGM 1Cx with a grade of D or better, or equivalent.*

Lingusitics/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. Midterm and final examinations. (F,W,S)

Linguistics/German (LIGM) 15, 16, and 17. Intermediate German for the Social Sciences (2)
Conducted entirely in German. 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. 15 is offered fall quarter only, 16 is offered winter quarter only and 17 is offered spring quarter only. Each course may be taken one time and need not be taken in sequence. *Prerequisites: 1D/Dx or at least three semesters/four quarters of college German or by permission of the instructor.*

See also: **Department of Literature**

GREEK

See: **Department of Literature**

See also: **Linguistics Directed Study**

HEBREW

See: **Judaic Studies**

See also: **Linguistics Directed Study**

ITALIAN

Linguistics/Italian (LIIT) 1A. Italian Conversation (2.5)
Small tutorial meetings with a native speaker of Italian. Must be taken in conjunction with LIIT 1Ax. *Prerequisite: no prior study of Italian required.*

Linguistics/Italian (LIIT) 1Ax. Analysis of Italian (2.5)
An introduction to the academic study of Italian, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken in conjunction with LIIT 1A. *Prerequisite: no prior study of Italian required.*

Linguistics/Italian (LIIT) 1B. Italian Conversation (2.5)
Small tutorial meetings with a native speaker of Italian. 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)
Review and refinement of phonological, morphological, and syntactic elements of Italian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken in conjunction 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 tutorial meetings with a native speaker of Italian. 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)
Review and refinement of phonological, morphological, and syntactic elements of Italian and introduction to elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken in conjunction 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/1Ax-1B/1Bx-1C/1Cx. Fundamentals of Portuguese (5-5-5)
Introduction to spoken and written Portuguese. Includes extensive development of comprehension and speaking skills as well as training in the reading and writing of Portuguese. *Prerequisite: none.* (Not offered every year.)

See also: **Linguistics Directed Study**

RUSSIAN

See: **Department of Literature**

See also: **Linguistics Directed Study**

SPANISH

Linguistics/Spanish (LISP) 1A. Spanish Conversation (2.5)
Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with LISP 1Ax. *Prerequisite: no prior study of Spanish required.*

Linguistics/Spanish (LISP) 1Ax. Analysis of Spanish (2.5)
An introduction to the academic study of Spanish, including phonology and orthography, morphology, and syntax. The linguist conducting the class will assign and help interpret and test reading assignments in and about the language. Must be taken with LISP 1A. *Prerequisite: no prior study of Spanish required.*

Linguistics/Spanish (LISP) 1B. Spanish Conversation (2.5)
Small tutorial meetings with a native speaker of Spanish. 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)
Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. 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 tutorial meetings with a native speaker of Spanish. 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)
Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. 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 tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with LISP 1Dx. *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)
Review and refinement of phonological, morphological, and syntactic elements of Spanish and introduction of elements of the culture. Reading assignments in and about the language discussed and tested in class. Must be taken with LISP 1D. *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. Intermediate Spanish for the Social Sciences (2)
(Formerly Linguistics/Spanish (LISP) 41, 42, 43.) Conducted entirely in Spanish. Course aims to improve oral language skills through discussions of social topics, with emphasis on political events and current affairs. Course materials encompass televised news broadcasts, newspapers, and periodicals. *Prerequisites: 1D/1Dx or at least three semesters/four quarters of college Spanish or consent of instructor.* May be taken for credit three times.

See also: **Department of Literature**

DIRECTED STUDY

Linguistics/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
Bengali
Bulgarian
Burmese
Cambodian
Catalan
Chinese, Cantonese
Chinese, Mandarin
Chinyanja
Cree
Czech
Danish
Dutch
Esperanto
Finnish
French
Fula
Gaelic, Irish
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

UNDERGRADUATE PROGRAM:
3110 Literature Building

GRADUATE PROGRAM:
3139/3140 Literature Building

ADMINISTRATIVE OFFICE:
3124 Literature Building

Professors

Ronald S. Berman, Ph.D., *English and American Literature*
Steven Cassedy, Ph.D., *Slavic and Comparative Literature*
Alain J.-J. Cohen, Ph.D., *Comparative Literature*
Jaime Concha, Ph.D., *Spanish and Latin American Literature*
Stephen Cox, Ph.D., *English Literature; Director, Revelle Humanities Writing Program*
Michael Davidson, Ph.D., *American Literature, Writing*
Abraham J. Dijkstra, Ph.D., *American and Comparative Literature*
Page duBois, Ph.D., *Classics and Comparative Literature*
William Fitzgerald, Ph.D., *Classics and Comparative Literature*
Richard Elliott Friedman, Th.D., *Hebrew and Comparative Literature; Katzin Professor of Jewish Civilization*
Marcel Hénaff, Ph.D., *French Literature*
Fanny Howe, *Writing*
Susan Kirkpatrick, Ph.D., *Spanish and Comparative Literature; Chair, Women's Studies*
Masao Miyoshi, Ph.D., *English, Japanese and Comparative Literature; Hajime Mori Endowed Chair*
Louis Adrian Montrose, Ph.D., *English and American Literature*
Jerome Rothenberg, M.A., *American Literature, Writing*
Rosaura A. Sánchez, Ph.D., *Spanish, Latin American, and Chicano Literature; Chair*
William S. Tay, Ph.D., *Chinese and Comparative Literature*
Quincy Troupe, B.A., *Writing; African American Literature*
Donald T. Wesling, Ph.D., *English and American Literature, Writing*
Sherley Anne Williams, M.A., *American and African American Literature, Writing*
Wai-lim Yip, Ph.D., *Chinese and Comparative Literature*

Associate Professors

Linda Brodkey, Ph.D., *Writing; Director, Warren College Writing Program*
Robert Cancel, Ph.D., *African and Comparative Literature*
Anthony Edwards, Ph.D., *Classics and Comparative Literature*
Todd Kontje, Ph.D., *German and Comparative Literature*
Stephanie H. Jed, Ph.D., *Italian and Comparative Literature*
Lisa Lowe, Ph.D., *Comparative Literature*
George Mariscal, Ph.D., *Spanish Literature*
William A. O'Brien, Ph.D., *German and Comparative Literature*
Fred V. Randel, Ph.D., *English Literature*
Roddey Reid, Ph.D., *French Literature*
Marta E. Sánchez, Ph.D., *Latin American and Chicano Literature*
Kathryn Shevelow, Ph.D., *English Literature*
Barbara Tomlinson, Ph.D., *Writing; Director, Muir College Writing Program*
Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*
Cynthia Walk, Ph.D., *German Literature*
Don Edward Wayne, Ph.D., *English Literature*
Winifred Woodhull, Ph.D., *French Literature*

Assistant Professors

Rosemary George, Ph.D., *English Literature*
Judith Halberstam, Ph.D., *English and American Literature*
Max Parra, Ph.D., *Mexican and Latin American Literature*
Shelley Streeby, Ph.D., *American Literature*
Nicole Tonkovich, Ph.D., *American Literature; Director, Eleanor Roosevelt College Writing Program*
Lisa Yoneyama, Ph.D., *Japanese Studies and Cultural Studies*
Oumelbanine Zhiri, Ph.D., *French Literature*

Professors Emeriti

Jack Behar, Ph.D.
Carlos Blanco-Aguinaga, Ph.D.
Diego Catalan, Ph.D.
Charles Cooper, Ph.D.
David K. Crowne, Ph.D.
Thomas K. Dunseath, Ph.D.
Edwin S. Fussell, Ph.D.
Reinhard Lettau, Ph.D.
James K. Lyon, Ph.D.

Roy Harvey Pearce, Ph.D.
John L. Stewart, Ph.D.
Andrew Wright, Ph.D., F.R.S.L.

Lecturers

Rae Armantrout, M.A., *Writing*
Charles Chamberlain, Ph.D., *Classical Languages and Literature, Writing*
Fraser Cocks, Ph.D., *American Literature; Director, Dimensions of Culture*
Robert Dorn, M.A., *Writing*
Leslie Collins Edwards, Ph.D., *Classical Languages and Literature*
Melvyn Freilicher, C.Phil., Writing
Elizabeth Jordan, Ph.D., *Revelle Humanities Program*
Christine Norris, Ph.D., *Revelle Humanities Program and Women's Studies*
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

The study of literature is the study of ideas, language, and society. How to do things with words lies at the very heart of the study of literature and culture; the literature major trains students to read critically and write fluently. The abilities to be articulate and discerning, to analyze and think creatively are all sought-after traits in a number of professional careers, including education, law, technical writing, communications, journalism, advertising, public relations, business, management, and international affairs. Skills developed by majors in literature are considered to be assets by medical schools. An undergraduate major in literature also prepares students for graduate study and academic careers in literature and in the humanities.

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 the 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.

Writing 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, General Literature, German, Italian, Russian, Spanish, Writing, and the new 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 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, except in French, where two upper-division courses are required. Students should see an adviser to confirm the selection of the specific courses that will be taken to satisfy the upper-division component of the secondary literature requirement.

The lower-division component within the secondary literatures may be satisfied by: French 50; German, two courses numbered 50 or above; 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 17-18-19, 21-22-23-24, and 50 are applicable.

(General literature and writing courses may not be applied toward the English secondary literature requirement.) Note: Courses in foreign literatures which are cross-listed with general literature courses *do not* apply to the secondary literature requirement.

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 (199s) cannot be used to satisfy the upper-division secondary literature requirement but will, where appropriate, be applied to the upper-division major elective 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.

Study abroad that is to count toward the major should be done before the senior year. Students who take Education Abroad Program courses in a country appropriate to their major may use a maximum of five upper-division courses to satisfy major requirements. These must be petitioned through the department once they have been entered on the student's official UCSD record.

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.

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 end of the junior year. Students meeting these requirements will be sent, the following fall, an invitation to participate in the program. In unusual cases, admission may also be granted to a senior who, though not meeting the GPA requirements, has submitted to the Literature Honors Committee by the end of the third week of fall quarter a petition for admission supported by three recommendations from members of the literature faculty. During the winter quarter of their senior year, all honors students together take an honors seminar (LTGN 191), which aims to deepen their understanding of the issues of theory and method implied in the study of literature. At this time, they lay 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

Students with upper-division standing and a departmental GPA of at least 3.0 are eligible to take Special Studies courses (198s and 199s). Those not satisfying this requirement 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.

Individual Program Requirements

Primary Concentration in Literatures in English

1. Four lower-division courses, two from each of the following two groups:
   a. ITFN 21, 22, 23, and TWS 21.
   b. LTEN 17, 18, 19, and LTEN 24.

   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 in literatures orginally written in English, including courses from each of the following five categories:
   a. British literature before 1660: at least two courses
   b. British literature from 1660 to 1832: at least one course
   c. British literature from 1832 to the present: at least one course
   d. United States literature before 1860: at least one course
   e. United States literature after 1860: at least one course
3. One course in literature/cultural studies or literature/theory.
4. 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, except in French, where two upper-division courses are required. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses do not apply to the secondary literature requirement.
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

French Literature

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 (199s) and courses in foreign literatures which are cross-listed with general literature courses 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.

German Literature

1. Nine upper-division courses in German literature. Three 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, except in French, where two upper-division courses are required. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses 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.

Italian Literature

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, except in French, where two upper-division courses are required. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses 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.

Russian Literature

1. Russian 1A-B-C and 2A-B-C or their equivalent
2. Twelve upper-division courses in Russian:
   a. LTRU 101A-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, except in French, where two upper-division courses are required. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses do not apply to the secondary literature requirement.

Spanish and Latin American Literature

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 119A, 119B, or 119C, Cervantes
   d. Six additional upper-division courses in Spanish, Latin American and/or Chicano literature
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, except in French, where two upper-division courses are required. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses do not apply to the secondary literature requirement.
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 General Literature

The purpose of the general literature major is to give students experience with the various modes of organizing literary study, without the exclusive concentration in a national literature characteristic of the previously described literature programs. Students in general literature may choose from a variety of concentrations, including European literature, world literature, Third World literature, U.S. ethnic literature, cultural studies, gender studies, and film studies, among others.

1. Group A: Four upper-division courses in a single national literature–that is, literature originally written in a single language, such as Russian, German, English, or a regional literature (current offerings: Africa, Latin America, and East Asia). These courses may treat the literature in the original language, or in translation, or in a combination of the two.
2. Group B: Four additional upper-division courses dealing with a particular concentration or topic in literary study, a specific period, genre, or a second national literature. Some examples are topics in gender, sexuality, 20th century novel, ethnic literature, literature of the ancient world, popular literature/cultural studies, Italian literature.
3. Group C: Any four upper-division courses in literatures other than U.S. and European. For this requirement, students choose courses in

African, Asian, and Latin American literatures. If some or all of the courses taken to meet this requirement also fulfill rquirements in Group A or Group B, students may take any other upper-division literature courses to complete the twelve required courses for the major.

4. 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, except in French, where two upper-division courses are required. Upper-division courses taken to satisfy the secondary literature requirement may be counted as part of the twelve upper-division courses for the General Literature major and may, where appropriate, be applied to Group A, Group B, or Group C. Students should see an adviser when selecting specific courses that willl be taken to satisfy this requirement. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses do not apply to the secondary literature requirement.
5. One course in Lit/Writing may be applied to Group B, if the subject of the writing course is centrally related to the Group B topic. For example, if the topic chosen for Group B is poetry, a course in the writing of poetry could be one of the four courses offered to satisfy the requirement.
6. At least two of the required twelve upper-division courses must be in literature written prior to 1700.

Dual Major in Literature

The dual major in literature is designed to allow students to develop a solid foundation in two national literatures. This dual or composite major will require that students consult a faculty adviser in order to work out a dual concentration that meets the following criteria:

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 General Literature.
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 119A, B, or C, 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.

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 new pre-writing major code. Admission to the writing major will be determined by evaluation of each student's performance in the LTWR 8A/8B/8C/8D sequence.

Primary Concentration in Writing

The writing major is designed to provide directed experience in writing prose fiction and nonfiction, media workshops, and poetry, as well as intensive work in practical criticism. An indispensable feature of the program is that it involves students with the work of their peers. Those who think of themselves as writers will find courses regularly offered in the various genres to develop their own style and breadth of experience in composing and criticism. Those who are primarily interested in the teaching of writing will find the major a context both for writing extensively and for dealing critically with the act of written composition. Note that students entering UCSD between fall 1991 and spring 1996 must complete the sequence LTWR 8A/8B/8C prior to declaring a major in Writing; beginning fall 1996, students have the option of substituting LTWR 8D for 8C. The major requirements are as follows:

1. Any of the following literature sequences:
   a. LTGN 4A-B-C-D-E-F-G-H-I-M–any three courses in the sequence (Fiction and Film in Twentieth-Century Societies)
   b. LTGN 19A-B-C (Introduction to the Ancient Greeks and Romans)
   c. LTEN 21, 22, and one course chosen from LTEN 17, 18, 19, 23, or 24.
   d. TWS 21, 22, 23 (Third World Literatures)
2. A minimum of twelve upper-division courses:
   a. Six upper-division courses in Lit/Writing from the writing workshop sequence (LTWR 100–128, 180). 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 140-146.
   c. Five upper-division electives chosen from Department of Literature offerings; at least four of these courses must be other than Lit/Writing courses.
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, except in French, where two upper-division courses are required. Students should see an adviser when selecting specific courses that will be taken to satisfy this requirement. Special studies courses (199s) and courses in foreign literatures which are cross-listed with general literature courses do not apply to the secondary literature requirement.

Double Major in 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 Writing and Another Literature

Students who wish to major both in writing and in literature (any section) should see the department for information regarding appropriate double major requirements.

The Minor in Literature

The department offers a wide range of possibilities for noncontiguous minors. The options include courses in a single national literature, courses in more than one literature, and a combination of language and literature courses. In all instances, the minors require six courses. At least three of the courses must be upper-division. The three upper-division courses must be taken at UCSD (or through EAP). *All courses taken to complete a literature minor must be taken for a letter grade.* No grade below C– is acceptable.

Lower-division courses applicable toward minors:

English–LTEN 17, 18, 19, 21, 22, 23, 24, 50
French–LTFR 2A, 2B, 2C, 50
German–LTGM 2A, 2B, 2C, 50, 51, 52, 53
Greek–LTGK 1, 2, 3
Hebrew–JUDA 1, 2, 3 (see Judaic Studies)
Italian–LTIT 2A, 2B, 50
Latin–LTLA 1, 2, 3
Russian–LTRU 2A, 2B, 2C
Spanish–LTSP 2A, 2B, 2C, 2D, 50A, 50B, 50C
Writing–LTWR 8A, 8B, 8C

General Minor—Six Literature courses: usually 1) a three-course lower-division sequence such as LTEN 17/18/19, LTEN 21/22/23, 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.

Writing Minor–The minimum of three upper-division courses must cover at least two major writing genres, with course work chosen from writing courses numbered 100 through 180.

The Graduate Program

Doctoral Degree Program

The department now 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 for the 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. A complementary working knowledge of a second language.

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; 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. Such "open" seminars should generally be related to the intended dissertation field. 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 will be reduced to two.

The third year–during which in place of three seminars, students may opt for three courses in independent study–is in part spent in completing preparation of the research papers required as part of the qualifying examinations, which come during the last quarter of the third year. 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 now include English, American, French, German, biblical Hebrew, Italian, Greek, Latin, Spanish, Chinese, Japanese, Polish, 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 in both 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 or, in exceptional cases, by completing with the grade of A two upper-division undergraduate courses given in the 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 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 (45–60 pages) and the two shorter research papers (20–30 pages) to be submitted for the C. Phil. degree. After satisfactory completion of the papers, a two-hour oral doctoral examination takes place. 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.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of three years. 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 two groups: (1) those who are admitted to the graduate program with the aim of proceeding to the master's degree only; and (2) full-time graduate students who are 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. It is possible to take an M.A. in Spanish with a special emphasis on bilingual discourse or an M.A. in English with a special emphasis on composition theory. *Note: The department does not offer financial support for M.A. candidates.*

Completed applications and supporting materials must be received before January 13, 1997 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. Students in comparative literature must take a four-unit seminar conducted in a language other than that of the student's principal concentration or, for ancient and oriental languages, an upper-division course where the texts are read in the original language.
2. Eight additional units of graduate seminars, upper-division courses, and/or guided independent study. Up to four units of supervised teaching at UCSD may be applied toward this eight-unit requirement.
3. Four units of literature in a language other than that of the student's principal concentration. 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. An upper-division or graduate course 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 upper-division course in general literature 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.
4. Eight units of guided research, 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.

COURSES

NOTE: A list of specific course offerings (with names of instructors for the 1996–97 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.

LTCH 120. Readings in Classical Chinese Poetry (4)
This course is designed to introduce the art of Chinese poetry through close readings of the texts. Selections range from Shih ching to Sung tz'u, with particular emphasis on the high T'ang period. Students are required to read the texts in the original. *Prerequisite: two years of Chinese or equivalent.*

LTCH 140A. Classical Chinese Literature 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 as topics vary.

LTCH 140B. Modern Chinese Literature in Translation (4)
A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit as topics vary.

LTCH 140C. Contemporary Chinese Literature 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 as topics vary.

LTCH 198. Directed Group Study (4)
Directed group study in areas of Chinese literature not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

LTCH 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas not normally covered in courses. (P/NP grades only.) *Prerequisites: upper-division standing and permission of department.*

COMPARATIVE LITERATURE

GRADUATE

LTCO 202A-B-C. History of European Criticism and Aesthetics (4-4-4)
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: 202A, Classical Antiquity; 202B, Renaissance to Enlightenment; 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 215. Medieval Studies (4)
A study of styles and forms of narrative poetry in medieval English, French, German, and Latin. May be repeated for credit as topics vary.

LTCO 221. Renaissance Studies (4)
One or more major writers, texts, or trends of European Renaissance. May be repeated for credit as topics vary.

LTCO 224. Seventeenth-Century Studies (4)
One or more major writers, texts, or trends of seventeenth-century European literature. May be repeated for credit as topics vary.

LTCO 231. Eighteenth-Century Studies (4)
One or more major writers, texts, or trends of eighteenth-century European literature. May be repeated for credit when topics vary.

LTCO 241. Romanticism (4)
A study of the romantic movement in various national literatures. May be repeated for credit as topics vary.

LTCO 242. Nineteenth-Century Studies (4)
Consideration of one or more major figures, texts, trends, or problems in the nineteenth century. May be repeated for credit as topics vary.

LTCO 243. Symbolism (4)
A study of the poetic imagery and of the changes in symbolic and thematic significance from the eighteenth to the twentieth century. May be repeated for credit as topics vary.

LTCO 252. Modernism (4)
A sample investigation into the concept of period. The course will deal also with the question of the existence of modernism, the description of the phenomenon, and the causes to which it is to be attributed. May be repeated for credit as topics vary.

LTCO 255. Context, Text, and Self-Expression in Soviet Literature (4)
This seminar will examine the figuring of the text and the self of the creator within context shaped by Stalinism (extending from late 1920s to late 1980s). Sources include fictional and autobiographical-essayistic works by Osio and Nadezhda Mandelshtam, Boris Pasternak, Mikhail Bulgakov, Lidiia Chukovskaia and Andrei Siniavskii/Abram Terts. (Open to qualified seniors and juniors with consent of instructor.)

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.

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 281. Literature and Film (4)
A study of literature and film in relation to one another, to critical and aesthetic theories, and to historical contexts.

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 50. Introduction to Cultural Studies (4)
An introduction to cultural studies with a focus on the following areas: literary and historical studies, popular culture, women's studies, ethnic studies, science studies, and gay/lesbian studies. Particular emphasis on the question of "cultural practices" and their social and political conditions and effects.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor.

LTCS 100. Theories and Methods in Cultural Studies (4)
Readings 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. Additional readings in various conceptions of cultural studies.

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 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 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 140. Subaltern Studies in Context (4)
This course will explore some basic texts related to subaltern studies and the variations in the field as related to national and historical situations. Repeatable for credit when readings and focus vary.

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 155. The Cultural Politics of Science and Technology (4)
The course will examine interventions by the technosciences in the lives of citizens in the domains of biology, genetics, and medicine, including technologies of reproduction, drug testing, the Human Initiative, scientific/medical responses to AIDS, etc. Repeatable for credit.

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 202. Cultural Texts (4)
This seminar will examine a wide-ranging variety of cultural texts and use them to explore methods of reading and interpreting culture. Cultural texts may include: popular music, popular literature, film/TV/video, comics, photography, performance art.

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 222. Theory and History of Film (4)
This course will consider various theoretical approaches to film texts (historical-materialist, feminist, psychoanalytic, semiotic) as well as the history of film, the political economy of film production and distribution, exhibition practices, and spectatorship in national and transnational contexts. 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 Decolonialization (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 decolonialization, the "postcolonial" and feminist critiques of "modernity"/modernization will also be studied.

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. Repeatable for credit.

LTCS 260. National Cultures (4)
Selected topics on the construction of national cultural identities. Investigation of the dynamics of canon formation and nation building in specific historical contexts. Repeatable for credit.

LTCS 295. M.A. Thesis (1–8)
Research for master's thesis. May be repeated for a cumulative total of up to eight units.

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 17. 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 18. 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 19. 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 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 24. Introduction to the Literature of the United States (4)
An introduction to the literatures written in English in the United States, with a focus on the interaction of text and history.

LTEN 50. Introduction to Shakespeare: The Theatre and the World (4)
An introduction to Shakespeare's dramatic achievement through the study of several major plays—representative comedies, histories, and tragedies—in their literary, intellectual, and social contexts.

LTEN 90. Undergraduate Seminars (1)
Readings and discussions focused on a writer, period, or literary topic. The aim of the course is to acquaint the lower-division student with literatures in English as fields of university study. Does not fulfill major or minor requirements in literature. Repeatable for credit when topics vary.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

LTEN 106. The Medieval Period (4)
Studies in medieval English literature. Topics such as medieval allegory in English, Chaucer's contemporaries, Middle English lyrics, and Middle English romances as well as surveys of Middle English literature will be presented.

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 108. The Waning of the Middle Ages (4)
Studies in English literature of the late Middle Ages and early Renaissance. Various topics, including the craft-cycle plays; moralities and interludes; the Scottish Chaucerians; fifteenth-century poetry; Malory; and romances, visions, and satires of the late Middle Ages.

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 115D. The Golden Age of Elizabethan Literature (4)
An introduction to the literary achievement of Elizabethan England during the last two decades of the sixteenth century. Works by major writers in a variety of literary forms (e.g., sonnet, mythological poem, romantic epic, pastoral, satire, prose fiction, heroic and tragic drama) are studied in relation to relevant social contexts.

LTEN 115E. Elizabethan Verse: Poems, Poetics, and Society (4)
An introduction to the reading of Renaissance poems. Elizabethan poetry in a variety of forms will be studied in the context of Elizabethan poetics, cultural values, and social relations.

LTEN 116. Elizabethan and Jacobean Drama (4)
The study of representative plays from one of the great moments in the history of dramatic literature. Tragedies and comedies, primarily by Shakespeare's contemporaries and successors, are read in the context of the historical, social, and intellectual background of the period.

LTEN 117A. The Seventeenth Century: Themes and Issues (4)
Selected topics in English literature during a period when writers felt deeply the impact of social change, religious controversy, the emergence of the "New Science," and the English Civil War. Readings chosen from among the works of a diverse group of writers, including Jonson, Donne, Bacon, Milton, Marvell, and Dryden.

LTEN 117B. Seventeenth-Century Verse (4)
A study of the varieties of poetry and poetic style from the end of the reign of Elizabeth I up to the Restoration. The course may consider major poets such as Donne, Jonson, Herbert, or Marvell individually and comparatively. Or it may examine a particular mode (e.g., metaphysical or cavalier poetry) through which poets who share stylistic and thematic concerns are studied.

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 120B. The Age of Pope (4)
Pope, Swift, Addison, Steele, Gay, and their contemporaries.

LTEN 120C. Samuel Johnson and His Time (4)
Johnson, Boswell, Burke, Goldsmith, and their contemporaries.

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 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 127G. The Nineties: Decade of Decadence (4)
Selected topics concerning literature and culture from the 1890s. Themes and metaphors of the fin de siecle might include imperial decline, sexual anarchy, crises of transition, the emergence of modern sexual identity, censorship issues, boundary violations.

LTEN 130A. Modern British Literature: Themes and Issues (4)
Selected topics concerned with modern British literature as a whole.

LTEN 130B. Modern British Poetry (4)
Such poets as Thomas Hardy, D.H. Lawrence, Hugh MacDiarmid, W.H. Auden, Dylan Thomas, Philip Larkin, Ted Hughes, and Geoffrey Hill.

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 135. Twentieth-Century Literature from the Indian Subcontinent (4)
An examination of the changes in a literature produced from a specific geographic location during a specific historical period–literature in English from British India (between 1900\-1947) and from independent Pakistan and India (after 1947).

LTEN 143. The English Novel in the Eighteenth Century (4)
This course studies the writing of the novel in English during 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 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 between World War I and World War II–the age of the great American modernists, among them Pound, H.D., and Eliot; Hemingway, Stein, and Faulkner; Stevens, Moore, and Williams.

LTEN 159. Twentieth-Century American Literature and Culture (4)
Selected topics concerning the relationship between literature and culture in twentieth-century America. Repeatable for credit.

LTEN 171. American Poetry I—through Early Whitman (4)
Reading and interpretation of American poets from the Puritans through the emergence of Whitman. Lectures will set the appropriate context in sociocultural and literary history.

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 173. American Fiction I—through Early James (4)
Reading and interpretation of American fiction from its early nineteenth-century origins through the emergence of Henry James. 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 179. Italian North American Culture (4)
This course will consider the phenomenon of Italian emigration as a product of sociopolitical trends in nineteenth-century Italy and Europe that led to Italian unification in 1861. Within that context, an analysis of the cultural products of Italian North Americans will be used to read contemporary trends in multiculturalism and ethnic culture in North America.

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, African 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.

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.

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 214. Middle English Literature (4)
Consideration of one or more major figures, texts, or trends in Middle English literature. May be repeated for credit as topics vary.

LTEN 221. Sixteenth-Century English Literature (4)
Critical study of one or more major figures, texts, or literary trends in Tudor England. May be repeated for credit as topics vary.

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 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 251. Twentieth-Century English Literature (4)
Consideration of one or more major figures, texts, or trends in twentieth-century English literature. 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 as topics vary.

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 279. Methodology Studies in Literatures in English (4)
Topics that relate new developments and internal debates in the field to the practice of teaching. Multiculturalism, cultural studies in relation to traditional English studies, revision of the canon; practical teaching issues including construction of syllabi, lecturing on topics that are under contestation, sensitivity to the traditions of the field and to recent debates and the needs of students in the 1990s. Repeatable 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.

FRENCH LITERATURE

LOWER-DIVISION

Language and Literature Courses

Ordinarily, students entering the French literature program elect the following sequence: LTFR 2A, 2B, and 50.

LTFR 2A, 2B, 50. Readings and Interpretations/Advanced Readings and Interpretations (5-5-4)
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. These courses may not be repeated for credit. *Prerequisites: LTFR 2A-LTFR 33/53, 1C/1CX or its equivalent; LTFR 2B-LTFR 2A or its equivalent, LTFR 50-LTFR 2B or its equivalent.*

LTFR 2C. Composition and Conversation (4)
This course assists students in acquiring the composition and conversation tools needed to discuss and write the critical essays required in upper-division courses. It focuses on four major activities designed to encourage the expression and organization of abstract thoughts in French: a) reading and analyzing literary texts; b) reviewing grammatical difficulties; c) studying and practicing composition techniques; d) oral activities. *Prerequisite: LTFR 2B or consent of instructor.*

LTFR 21. Debating French Literature and Culture I (4)
This course is designed to allow first-year literature students to practice and develop their oral skills. It will do so by expanding the vocabulary necessary to discuss abstract ideas and by building up the confidence necessary to participate in literature classes. Repeatable for credit as topics vary. *Prerequisite: LTFR 1C/1CX or equivalent or consent of instructor.*

LTFR 31. Debating French Literature and Culture II (4)
This course is designed to develop oral skills at an advanced level. By participating in debates organized around literary and cultural topics, students will strengthen their ability to discuss abstractly and theoretically in French. Repeatable for credit as topics vary. *Prerequisite: LTFR 2B or consent of instructor.*

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 French 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. *Prerequisite: LTFR 50.*

LTFR 116. Themes in French 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. *Prerequisite: LTFR 50.*

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 122. Seventeenth Century (4)
Major literary works of the seventeenth century. 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. French Literature (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. Genres of French Literature (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 French 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 145. Contemporary French Thought (4)
Presentation of major currents and debates in contemporary philosophy, linguistics, psychoanalysis, anthropology, and social and feminist theory that have led to major changes in French cultural and literary studies.

LTFR 160. Composition and Stylistics (4)
Analysis of classical and modern French literary texts to increase the student's sensitivity to style and improve his or her ability to write and speak French.

LTFR 161. Poetic Analysis (4)
Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will introduce the student to the basic modes of poetic analysis. The emphasis of the course will be on the acquisition of a method and the mastery of specific techniques of reading poetic texts rather than on their content or on the historical continuity and/or development of their themes or forms.

LTFR 162. Translation of Literary Texts: French to English (4)
A workshop in the problems and techniques of literary translation. A good reading knowledge of French is required. This course counts for majors whose primary literature is French. Not applicable to the secondary literature requirement in other literature majors.

LTFR 163. Translation Workshop (4)
The course centers on issues in the theory and practice of literary translation. Students should be proficient in French and English. Their primary task will be to translate several literary texts and discuss the versions with the instructor and other course members, and they will also do selected readings in translation theory and in published translations. May be repeated for credit twice. *Prerequisite: department stamp required.*

LTFR 164. French Civilization (4)
An introduction to several major sectors and themes of contemporary France: the family, the school system, social structures, the economy, the political structures and parties. Emphasis on vocabulary of these sectors and ability to analyze documents involving such themes.

LTFR 165. Explication de texte/Close Reading (4)
A course in a fundamental technique of literary analysis–close reading–central to literary study in France. Designed for upper-division students planning further work in literature. Application of the close-reading technique to a variety of examples from different periods and genres.

LTFR 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 seminar in a single quarter.

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 220. Introduction to Old French Language and Literature (4)
An introduction to the reading of Old French and a study of the medieval period through original texts. May be repeated for credit as topics vary.

LTFR 221. Renaissance (4)
Critical study of one or more major figures, texts, or literary trends of the French Renaissance. May be repeated for credit as topics vary.

LTFR 222. Seventeenth-Century French Literature (4)
Consideration of one or more major figures, texts, or trends in seventeenth-century French literature. May be repeated for credit as topics vary.

LTFR 223. Eighteenth-Century French Literature (4)
Consideration of one or more major figures, texts, or trends in eighteenth-century French literature. May be repeated for credit as topics vary.

LTFR 224. Nineteenth-Century French Literature (4)
Consideration of one or more major figures, texts, or trends in nineteenth-century French literature. May be repeated for credit as topics vary.

LTFR 225. Twentieth-Century French Literature (4)
Selected topics in modern French literature and thought. May be repeated for credit as topics vary.

LTFR 240. Topics in French Literature (4)
An examination of one or more major topics in French literature.

LTFR 245. Literature and Cultural Issues (4)
Cultural issues related to literature, theory, and philosophy in the French tradition and Francophonic countries. Repeatable for credit.

LTFR 260. Poetic Analysis (4)
Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will emphasize the methods and techniques of poetic analysis. The particular attention given to one or several approaches to the text–formal, thematic, textual, etc.–as well as the specific composition of the corpus of texts to be studied will vary with each instructor of the course. In every case, however, the focus will be on the assimilation of a method and the mastery of a specific technique of reading poetic texts rather than on their content or on the historical continuity of their themes or forms.

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.

GENERAL LITERATURE

In both lower- and upper-division general literature courses, texts may be read in English translation when necessary, and lectures and discussions are conducted in English.

LOWER-DIVISION

LTGN 4A-B-C-D-E-F-G-H-I-M. Fiction and Film in Twentieth-Century Societies (4-4-4-4-4-4-4-4-4-4)
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 relationships 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. Spanish
4D. Italian
4E. Russian
4F. Chinese
4G. Japanese
4H. British
4I. American
4M. Multiple national literatures and film

LTGN 12B. The Language of Italian Opera (4)
An introduction to Italian culture, expression, and language through the study of opera libretti. To be taken concurrently with Music 12.

LTGN 19A-B-C. Introduction to the Ancient Greeks and Romans (4-4-4)
This interdisciplinary sequence includes the literature, mythology, art, philosophy, and history of ancient Greece and Rome, a complex civilization which had a determining influence on all later Western culture.

TWS 21-22-23. Third World Literatures (4-4-4)
(See entry under "Third World Studies" heading.)
The courses in this sequence are equivalent to general literature courses. The sequence satisfies Marshall College general-education requirements.

LTGN 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.

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor.

European Literature in Translation

LTGN 100. The Classical Tradition (4)
Greek and Roman literature in translation. May be repeated for credit as topics vary.

LTGN 101. 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.

LTGN 102. Literature of the Renaissance (4)
A study of literary/humanistic texts from various cultures involved in the European Renaissance.

LTGN 104. Studies in Eighteenth-Century European Literature (4)
Topics to be considered include the age of sensibility, Enlightenment, neoclassicism. Attention given to historical and cultural contexts.

LTGN 105. 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.

LTGN 109. Russian Culture: The Modern Period (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.

LTGN 110A-B-C. Survey of Russian and Soviet Literature in Translation, 1800 to the Present
A study of literary works from Pushkin to the present.

110A. 1800–1860
110B. 1860–1917
110C. 1917–present

LTGN 111. Nineteenth-Century Russian Literature (4)
A study of literary works from the nineteenth century. May be repeated for credit when topics vary.

LTGN 112. 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.

LTGN 113. Genres in Russian Literature in Translation (4)
An examination of one or more genres in Russian literature–for example, the novel, the short story, autobiography, drama, poetry. All readings will be in English. May be repeated for credit as topics vary.

LTGN 114. Single Authors 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.

LTGN 115. Russian and Soviet Film (4)
An examination of pivotal films, filmmakers, and film theories from Russia and the former Soviet Union in their cultural and historical contexts. May be repeated for credit when topics vary.

LTGN 116. Spanish Literature in Translation (4)
One or more periods or authors in Spanish literature. Texts may be read in English. May be repeated for credit as topics vary.

LTGN 117. French Literature in Translation (4)
One or more periods or authors in French literature. Texts may be read in English. May be repeated for credit as topics vary.

LTGN 118. 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.

LTGN 119. 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.

LTGN 120. Yiddish Literature in Translation (4)
Representative works of fiction, drama, poetry, parable, film, and song from Eastern European Jewish culture. Topics include Chasidism, Zionism, the life of the shtetl, relations with the biblical and rabbinic traditions, and a study of literary forms and styles. May be repeated for credit as topics vary.

LTGN 121. 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.

LTGN 122. 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.

LTGN 123. Women in Italy (4)
A study of historical, political, and literary texts regarding women and feminism in Italian society.

LTGN 124. Italian Romanticism in Translation (4)
This course will consider the rise of romanticism in Italy and its relationship to European romanticism. Particular attention will most likely be paid to the works of Foscolo and Leopardi. Credit will not be given for both LTGN 124 and LTIT 118, Italian Romanticism.

LTGN 125. Theory in Italy (4)
Selected topics in Italian theory, criticism, and philosophy from the eighteenth to twentieth centuries. Will be organized around one or two leading figures in theory and Italy (such as Vico, Crice, or Gramsci). All readings in translation. Repeatable for credit when topics vary.

LTGN 126. 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. Repeatable for credit. (Cross-listed with LTIT 136.)

LTGN 127. Studies in Modern Italian Prose (4)
A study of the chief modern Italian *prosatori* including D'Annunzio, Calvino, Pavese, Pasolini, etc. Repeatable for credit. (Cross-listed with LTIT 137.)

Non-U.S. and European Literatures in Translation

LTGN 130. 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.

LTGN 132. African Oral Literature (4)
This is a survey of various genres of African and oral literary traditions. Although the focus is on oral narrative genres, investigation of proverb, riddle, praise poetry, and epic also falls into the compass of the course. The central concern will be the development and use of a methodology to analyze the aspects of performance, composition, and education in oral traditional systems.

LTGN 133. Introduction to 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.

LTGN 136. 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.

LTGN 137. 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.

LTGN 140A. Classical Chinese Literature 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 as topics vary.

LTGN 140B. Modern Chinese Literature in Translation (4)
A survey of representative works of the modern period from 1919 to 1949. May be repeated for credit as topics vary.

LTGN 140C. Contemporary Chinese Literature 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 as topics vary.

LTGN 142A-B-C-D-E. Earlier Japanese Literature in Translation (4-4-4-4-4)
An introduction to earlier Japanese (bungo) literature in translation. Each course will focus on several works, placing their forms in the historical context. No knowledge of Japanese required. May be repeated for credit as topics vary.

142A. General
142B. Poetry
142C. Prose Fiction
142D. Drama
142E. Essay, Travelogue, Diary, etc.

LTGN 143A-B-C-D-E. Later Japanese Literature in Translation (4-4-4-4-4)
An introduction to later Japanese (kogo) literature in translation. Each course will focus on several "modern" works, placing their form in the historical context. No knowledge of Japanese required. May be repeated for credit as topics vary.

143A. General
143B. Poetry
143C. Prose Fiction
143D. Drama/Film
143E. Essay, Criticism, etc.

LTGN 144. A Single Japanese Author (In Translation) (4)
A good number of Japanese authors are by now well represented in English translation. The course will focus on one writer and his or her relationships to the social context. May be repeated for credit as topics vary.

LTGN 145. 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.

LTGN 146. Japanese Literary Works/Writers in Japanese (4)
Intended for students with the knowledge of the language. Selections range from Heian to contemporary works. Critical examination of the texts; not just translation exercise. May be repeated as topics vary. Consult with the instructor before registering for the course. May be repeated for credit as topics vary.

Topics in Literature

LTGN 147. Words and Their Vicissitudes (4)
An inquiry into several aspects of words: etymology, semantic change, and the inescapability of metaphor, among others. These explorations may serve to bolster students' interpretive acuity, historical perspective on language, and expressive powers.

LTGN 148. The Bible and Western Literature (4)
Biblical and related texts that influenced the great writers of the Middle Ages and the Renaissance, including selections from the Jewish and Christian scriptures.

LTGN 149. The Jewish Experience in Literature (4)
Literary works from various periods dealing with Jewish themes, with an emphasis on modern Jewish writing in America, Russia, etc. May be repeated for credit as topics vary.

LTGN 150. Jewish Mysticism (4)
Theological and literary texts covering the broad range of Jewish mystical experience, with discussion of analogous developments in other religious traditions.

LTGN 151. 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 analysis, theological issues, reference to archaeological data.

LTGN 152. The Bible: The Narrative Books (4)
Examination of the biblical accounts in their ancient Near Eastern context. Literary-critical, form-critical, and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues.

LTGN 153. The Bible: The Poetic Books (4)
Study of biblical poetry, its settings, genres, and themes. Analysis of metre and structure with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples.

LTGN 154. Medieval Hebrew Literature (4)
Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period.

LTGN 155. Hebrew Literature: The Modern Period (4)
Selected topics in modern Hebrew literature.

LTGN 156. Topics in the Prophets (4)
Study of a single book, period, or issue in the biblical prophets.

LTGN 157. Topics in Biblical Narrative (4)
Study of a single book, period, or issue in the narrative books of the Bible.

LTGN 158. Topics in Biblical Poetry (4)
Study of a single book, period, or issue in the poetic books of the Bible.

LTGN 159. A Cultural History of American Jewry (4)
A cultural history of Jewish immigrants in the United States, beginning in the seventeenth century. Emphasis will be on the period of mass immigration, beginning in the 1880s, and on the Russian and European origins of Jewish immigrants.

LTGN 160. Specialized Genres in Literature (4)
The study of literary genres that do not fall into the ordinary categories of lyric, drama, and fiction. Topics vary from year to year. May be repeated for credit as topics vary.

LTGN 161. Epic Poetry (4)
A study of major epics, in translation if their original language is not English. May be repeated for credit as topics vary.

LTGN 162. 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.

LTGN 163A. Modern and Postmodern Poetry I (4)
A study of early twentieth-century poetry across a wide spectrum of languages and literatures, involving poets such as Apollinaire, Stein, Rilke, Pound, Marinetti, H.D., Khlebnikov, Lorca, Breton, Tsvetayeva, Artaud, Vallejo, and Césaire, and movements ranging from Futurism, Expressionism, and Dada to Surrealism, the "Objectivists," and Negritude.

LTGN 163B. Modern and Postmodern Poetry II (4)
A study of twentieth-century world poetry in the latter half of the twentieth century, involving poets such as Celan, Paz, Rukeyser, Olson, Ritsos, Holan, Ginsberg, Jabès, Rich, Mac Low, Adonis, Pasolini, Brathwaite, Waldman, Takahashi, and Baraka, and movements including Fluxus, concrete poetry, the Beats, the *Wienergruppe*, language poetry, and the Misty poets.

LTGN 164. Lyric Poetry (4)
Studies in lyric poetry. Not confined to a single national literature. Texts may be read in English.

LTGN 165. Comedy (4)
Comedy in fiction and film from ancient times to contemporary, including the Bible, Aristophanes, Shakespeare, and modern writers and film makers.

LTGN 166. The Forms of Folklore (4)
A survey of the range of folkloristic phenomena as exemplified by major and minor forms–narrative, legend, myth, superstition, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

LTGN 167. 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.

LTGN 168. American Indian Literature (4)
An investigation of traditional native poetry and performance art of the Americas in relation to contemporary practices in the non-Indian world. Topics will vary and may include shamanism, ritual performance, mythopoesis, and oral narration. Repeatable for credit when topics vary.

LTGN 170. Travel Literature (4)
A critical examination of accounts of travel, initial encounters, and cultural interactions, structured by date/period, location, authorship, or another unifying concept. Lectures will position the readings in sociocultural and literary history. May be repeated for credit when topics vary.

LTGN 171. Children's Literature (4)
A study of literature written for children in various cultures and periods. May be repeated for credit as topics vary.

LTGN 172. 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.

LTGN 173. Contemporary Literature (4)
A study of novels and authors of the present and recent times. May be repeated for credit as topics vary.

LTGN 174. Popular Literatuare 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.

LTGN 175. Words into Images (4)
With the proliferation of comic books, photonovels, films, and television, these efforts toward the visualization of the verbal abstractions of literature have become a central concern of the entertainment industry. This course will explore the cultural implications of the transformation of words into images–what is gained and what is lost in the translation.

LTGN 176. The Psychology of the Filmic Text (4)
This 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, the generation and translation of films' 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.

LTGN 177. 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.

LTGN 179. 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.

LTGN 180A. Visual Arts, Film Studies, and Literature: Painting and Literature (4)
An investigation into themes and styles of mutual relevance to literature and painting. Repeatable for credit when topics vary.

LTGN 180B. Visual Arts, Film Studies, and Literature: Photography and Literature (4)
The history of photography and its effect upon literary descriptions and literary perception (Rf. Barthes, Sontag, et al.). Repeatable for credit when topics vary.

LTGN 180C. Visual Arts, Film Studies, and Literature: Art History and Literature (4)
The study of art history and its effect upon methods and styles in literary history. Repeatable for credit when topics vary.

LTGN 180D. Visual Arts, 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.

LTGN 180E. Visual Arts, Film Studies, and Literature: Study of Film Movement (4)
Study of analogies between literary movements and film movements. Repeatable for credit when topics vary.

LTGN 180F. Visual Arts, 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.

LTGN 180G. Visual Arts, Film Studies, and Literature: Close Analysis of Filmic Genre (4)
Methods of literary study of "genre" applied to the study of filmic "genre." Repeatable for credit when topics vary.

LTGN 180H. Visual Arts, Film Studies, and Literature: Studies in Film History (4)
The study of film history and its effects upon methods of styles in literary history. Repeatable for credit when topics vary.

LTGN 180I. Visual Arts, Film Studies, and Literature: Interdisciplinary Issues (4)
Inquiry into interrelated and interdisciplinary issues concerning the diverse field of the visual arts and literature.

LTGN 181. Mythology (4)
A study of various bodies of myth: their content, form, and meaning. May be repeated for credit as topics vary.

LTGN 182. Psychoanalysis and Literature (4)
Psychoanalytic approaches to art and literature. Readings in psychoanalytic literature and interpretation (from Freud to the present). Psychoanalysis as it defines and is defined by modernity.

LTGN 183. Introduction to Semiotics and Applications (4)
Students should acquire specific techniques and methods of analysis. Applications will vary from year to year, e.g., semiotics of literary discourse, semiotics of cinema, semiotics of legal discourse, etc. May be repeated for credit as topics will necessarily vary.

LTGN 184. Ethnopoetics: Living Poetry (4)
An investigation of a series of events that originally compose the full sentient being of poetry's body. This course seeks to recreate the living tangents of the lyrical moment (chanting, modulating, miming, dancing, meditating, impovising, etc.) for direct experience and expression. May be repeated for credit when topics vary.

LTGN 185. 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.

LTGN 186A-B-C. Modernity and Literature (4-4-4)
This course explores the various cross-cultural historical, philosophical, and aesthetic ideas which formed the basis of most twentieth-century literature. By pursuing comparatist tenets, this team-taught sequence will draw on diverse influences and areas to illustrate some of the ways in which literature not only reflects historical periods but also defines and shapes them. Literature from the Americas, Europe, Asia, and Africa will be studied through lectures and the reading of texts in English translation.

LTGN 187. 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.

LTGN 188. Culture, Ideology, and Collective Memory (4)
How do societies remember (and forget) the past and, through this process of collective memory, conceive their present? What stories are stored, who constructs them, and what purposes do they serve? Readings in the theory of ideology and close study of empirical cases.

LTGN 189. Gender Studies (4)
The study of the construction of sexual differences in literature and culture. May be repeated for credit when topics vary.

Seminars/Independent Studies

LTGN 190. Seminars (4)
These seminars are devoted to a variety of special topics, including the works of single authors, 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 seminar in a single quarter. *Prerequisites: upper-division standing, consent of instructor, and permission of department.*

LTGN 191. Honors Seminar (4)
Explorations in critical theory and method. This course, which is designed to prepare students for the writing of an honors thesis, is open only to literature majors who have been admitted to the Literature Honors Program. Literary texts will be drawn from several languages but will be available in English translation. (The Honors Seminar may be applied toward the primary concentration in the literature major.)

LTGN 195. Apprentice Teaching (0 & 4)
Undergraduate instructional assistance. Responsibilities both in area of learning and instruction. A student must (1) prepare reading materials assigned by the professor; (2) lead student discussions; (3) assist professor in grading; (4) prepare a report to the professor at the conclusion of the quarter concerning his or her work.

LTGN 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.

LTGN 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.) *Prerequisites: upper-division standing and permission of department.*

LTGN 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

LTGN 500. Apprentice Teaching in Literature (2-4)
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. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit.

LTGN 501. Apprentice Teaching in Humanities (2-4)
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. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit.

LTGN 502. Apprentice Teaching in Muir College (2-4)
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. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit.

LTGN 503. Apprentice Teaching in Marshall College (2-4)
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. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit.

LTGN 504. Apprentice Teaching in Warren College (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. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit.

LTGN 506. Apprentice Teaching in Roosevelt College (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. This requirement is the equivalent of a 50 percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit.

GERMAN LITERATURE

LOWER-DIVISION

Language and Literature Courses

LTGM 2A. Readings and Interpretations (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. *Prerequisite: LIGM 1C/1CX or the equivalent or consent of instructor.* The course is designed to prepare students for LTGM 2B and LTGM 2C. Successful completion of LTGM 2A satisfies the requirement for language proficiency in Revelle College.

LTGM 2B. Advanced Readings and Interpretations (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. *Prerequisite: LTGM 2A or consent of instructor.*

LTGM 2C. Composition and Conversation (4)
A course designed for students who wish to improve their ability to speak and write German. *Prerequisite: LTGM 2B or equivalent or consent of instructor.*

LTGM 50-51-52-53. Readings in German Literature and Culture (4-4-4-4)
An introduction to German literature. May be taken for three quarters, starting with any quarter. The instructor will advise students when they have achieved sufficient proficiency to proceed to upper-division courses which call for an ability to read extensive texts in German. *Prerequisite: completion of LTGM 2C, or the equivalent preparation.*

50. Genres and Methods
51. Middle Ages and Renaissance
52. Classicism and Romanticism: Eighteenth and Nineteenth Centuries
53. The Twentieth Century

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor. Normally, a student will be expected to take two courses of the LTGM 50-51-52-53 sequence before being admitted to upper-division courses. Additional prerequisites may be specified below.

LTGM 100. German Literature (4)
One or more aspects of German literature, such as major authors, the contemporary novel, nineteenth-century poetry, German expressionism. The texts studied will be read in the original language. May be repeated for credit as topics vary.

LTGM 101. Major German Authors (4)
A study in depth of the works of a major German author. May be repeated for credit as topics vary.

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 as topics vary.

LTGM 124. Goethe (4)
Study of some major works in the context of Goethe's life and milieu. Recommended for literature majors whose primary literature is German. May be repeated for credit as topics vary.

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 133. The Forms of Folklore (4)
A survey of the range of folkloristic phenomena as exemplified by major and minor forms–narrative, legend, myth, superstition, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

LTGM 160. Composition and Stylistics (4)
Analysis of classical and modern German literary texts to increase the student's sensitivity to style and improve his or her ability to write and speak German. Stylistic variations and potentialities will be explored, various classical and modern texts will be analyzed to establish stylistic criteria and guiding principles. One composition per week on various subjects.

LTGM 170. Literature and Ideas (4)
This course will center on German writers or movements of international literary, cultural, or ideological significance. 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 202. Methods and Tools of Research (4)
A pragmatic workshop to familiarize students with basic methodological approaches, standard works of literary criticism, and indispensable tools of literary research.

LTGM 231. Eighteenth-Century German Literature (4)
Consideration of one or more major figures, texts, or trends in eighteenth-century German literature. May be repeated for credit as topics vary.

LTGM 238. Goethe (4)
A study of Goethe's work in the context of Goethe's life and milieu and of German classicism. May be repeated for credit as topics vary.

LTGM 241. German Romanticism (4)
Studies in the prose, poetry, and theoretical writings of German romantics. May be repeated for credit as topics vary.

LTGM 242. Nineteenth-Century German Literature (4)
Consideration of one or more major figures, texts, or trends in nineteenth-century German literature. May be repeated for credit as topics vary.

LTGM 251. The Twentieth Century (4)
A study of the structural, philosophical, and social aspects of twentieth-century German literature. May be repeated for credit as topics vary.

LTGM 252. Major German Authors (4)
A study in depth of the work of one major German author. May be repeated for credit as topics vary.

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.*

LTGK 4. Intensive Elementary Greek (12)
Equivalent of LTGK 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.

LTGK 100. Introduction to Greek Literature (4)
Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: LTGK 3 or equivalent.*

LTGK 101. Greek Composition (4)
Greek prose composition. *Prerequisite: completion of LTGK 100. Students must be concurrently enrolled in an upper-division LTGK 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)
Readings, in Greek, of texts from the Hellenistic period. May be repeated for credit as topics vary.

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. May be repeated for credit as topics vary.

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 134. Epic Poetry (4)
Readings, in Greek, in the works of Homer, Hesiod, and/or Apollonius Rhodius. 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 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 seminar in a single quarter. May be repeated for credit when 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

UPPER-DIVISION

Prerequisite: upper-division standing or consent of instructor.

LTHE 148. The Bible and Western Literature (4)
Biblical and related texts that influenced the great writers of the Middle Ages and Renaissance, including selections from the Jewish and Christian scriptures.

LTHE 151. 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 analysis, theological issues, reference to archaeological data.

LTHE 152. The Bible: The Narrative Books (4)
Examination of the biblical accounts in their ancient Near Eastern context. Literary-critical, form-critical, and textual analysis. Attention to related literature and to archaeological data; consideration of theological issues.

LTHE 153. The Bible: The Poetic Books (4)
Study of biblical poetry, its settings, genres, and themes. Analysis of metre and structure, with particular attention to the use of parallel. Comparison with Canaanite and Mesopotamian examples.

LTHE 154. Medieval Hebrew Literature (4)
Major literary works of the Middle Ages and Renaissance as seen against the historical and intellectual background of the period.

LTHE 155. Hebrew Literature: The Modern Period (4)
Selected topics in modern Hebrew literature.

LTHE 156. Topics in the Prophets (4)
Study of a single book, period, or issue in the biblical prophets.

LTHE 157. Topics in Biblical Narrative (4)
Study of a single book, period, or issue in the narrative books of the Bible.

LTHE 158. Topics in Biblical Poetry (4)
Study of a single book, period, or issue in the poetic books of the Bible.

LTHE 190. Seminars (4)
These seminars are devoted to a variety of special topics, including 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.

LTHE 198. Directed Group Study (4)
Directed group study in areas of Hebrew literature not normally covered in courses. (P/NP grades only.) *Prerequisite: permission of department.*

LTHE 199. Special Studies (2 or 4)
Tutorial; individual guided reading in areas of Hebrew 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.*

The following Summer Session course may be of interest:

LTHE 197. Field Study: Archaeology and the Bible (4-8)
Lectures and field work in excavations at the sites of importance to biblical archaeology. Students are expected to produce substantial final papers.

GRADUATE

LTHE 297. Directed Studies (1-12)
Guided and supervised reading in a broad area of Hebrew literature. Offered for repeated registration.

LTHE 298. Special Projects (4)
Treatment of a special topic in Hebrew literature. Offered for repeated registration.

ITALIAN LITERATURE

LOWER-DIVISION

(See Department of Linguistics for course offerings in first-year Italian.)

LTIT 2A. Advanced 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/1CX or equivalent or consent of instructor.*

LTIT 2B. Advanced Italian II (5)
Emphasis on composition discussion of literary texts in Italian. *Prerequisite: LTIT 2A or equivalent or consent of instructor.*

LTIT 50. Advanced Italian (III) (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 Italian Literature (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 116. Sixteenth-Century Prose (4)
Reading and discussion of sixteenth-century Italian novelle, philosophy, history, and scientific texts. May be repeated for credit when topics vary. *Prerequisite: LTIT 100 or permission of instructor.*

LTIT 118. Italian Romanticism (4)
This course will consider the rise of romanticism in Italy and its relationship to European romanticism. Particular attention will most likely be paid to the works of Foscolo and Leopardi. Credit will not be given for both LTIT 118 and LTGN 124, Italian Romanticism in Translation.

LTIT 122. Studies in Modern Italian Culture (4)
Politics, literature, and cultural issues of twentieth-century Italy.

LTIT 136. Studies in Modern Poetry
A study of the chief modern Italian poets, including Montale, Ungaretti, and Quasimodo, with attention to long poetic form and contemporary Italian culture.

LTIT 137. Studies in Modern Italian Prose (4)
A study of the chief modern Italian prosatori, including D'Annunzio, Calvino, Pavese, Pasolini, etc.

LTIT 138. Contemporary Italian Thought (4)
Presentation of major currents and debates in contemporary philosophy, anthropology, political theory, sociology, and feminism that have had an impact on Italian cultural studies. May be repeated for credit when topics vary. *Prerequisite: LTIT 100 or permission of instructor.*

LTIT 139. Italy and the Question of Subaltern Cultures (4)
Subaltern studies from Gramsci to Lombardi-Satriani to Cirese, with emphasis on issues of textuality. *Prerequisite: LTIT 100 or permission of instructor.*

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 150. Italian North American Culture (4)
This course will consider the phenomenon of Italian emigration as a product of sociopolitical trends in 19th century Italy and Europe that led to Italian unification in 1861. Within that context, and analysis of the cultural products of Italian North Americans will be used to read contemporary trends in multiculturalism and ethnic culture in North America.

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 162. Translation (4)
This course will concentrate on further developing writing and composition skills through translation exercise. Translation will be both from English to Italian and from Italian to English in order to give the greatest amount of practice in moving from one language to another. *Prerequisite: LTIT 161.*

LTIT 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 seminar in a single quarter. *Prerequisites: upper-division standing, consent of instructor, and permission of department.*

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.

LTIT 298. Special Projects (4)
Treatment of a special topic in 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.*

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. *Prerequisite: completion of LTLA 100. Students must be concurrently enrolled in an upper-division LTLA course numbered 111 or above.*

LTLA 102. Prose Composition (4)
Designed for those who have completed more than one upper-division course. Latin prose composition is aimed at refining students' grasp of Latin and appreciation of its varying styles through graded exercises in writing and selected readings. What is gained in such a course is a knowledge of the language from the inside out, rather than the opposite, which is usual in translation courses.

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 113. Augustan (4)
Readings, in Latin, in the works of Roman writers of the 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 120. Late Latin (4)
Readings, in Latin, in the works of Roman writers of the post-Silver Age. May be repeated for credit as topics vary.

LTLA 126. Renaissance Latin (4)
Readings, in Latin, in the works of the Renaissance period. May be repeated for credit as topics vary.

LTLA 130. The Novel (4)
Readings, in Latin, in the works of the Latin novelists. 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 Roman epic poets. May be repeated for credit as topics vary.

LTLA 134. History (4)
Readings, in Latin, in the works of Roman historians. May be repeated for credit as topics vary.

LTLA 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 seminar in a single quarter. 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 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.

LTRU 101A-B-C. Advanced Russian (4-4-4)
Third-year Russian. Advanced grammar and stylistics, introduction to analysis of Russian literary texts.

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 128. Single Author in Soviet Literature (4)
Study of the works of a single author from the Soviet period. 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 130. Genres in Russian Literature (4)
An examination of one or more genres in Russian literature–for example, the novel, the short story, autobiography, drama, poetry. May be repeated for credit as topics vary. *Prerequisite: LTRU 101C, its equivalent, or consent of instructor.*

LTRU 131. Russian Short Fiction (4)
A study of short works of fiction by a selection of Russian or Soviet authors. May be repeated for credit. *Prerequisite: LTRU 101C, its equivalent, or permission of instructor.*

LTRU 132. Russian Poetry (4)
Survey of Russian poetry from the late eighteenth century to the Revolution. *Prerequisite: LTRU 101C, its equivalent, or permission of instructor.*

LTRU 133. Russian and Soviet Drama (4)
A study of Russian and/or Soviet drama. Authors and topics may vary. May be repeated for credit. *Prerequisite: LTRU 101C, its equivalent, or permission of instructor.*

LTRU 150. Russian Culture: The Modern Period (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.

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 160. Russian Stylistics and Grammar (4)
Study of style in various textual and spoken genres of Russian. Review of grammar, geared toward individual student needs, and encouraging independent study of the language beyond this course. *Prerequisites: LTRU 101A-B-C or the equivalent.*

LTRU 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. *Prerequisites: upper-division standing and consent of instructor.*

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.*

SPANISH LITERATURE

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. Readings and Composition (5)
This course is taught entirely in Spanish and emphasizes the development of reading ability, listening comprehension, and writing skills. It includes grammar review, weekly compositions, and class discussions. *Prerequisite: completion of LISP 1C/1CX, 1D/1DX, or the equivalent. Successful completion of LTSP 2A satisfies the requirement for language proficiency in Revelle College.*

LTSP 2B. Readings and Interpretations (5)
This course further reviews major points of grammar and emphasizes critical reading and interpretation of Spanish texts through class discussion, vocabulary development, and written compositions. It is a continuation of LTSP 2A. *Prerequisite: LTSP 2A or consent of instructor.*

LTSP 2C. Cultural Readings and Composition (4)
This course is a continuation of LTSP 2B, with special emphasis on problems in writing and translation. It includes class discussion of cultural topics as well as grammar review and composition. The course will further develop the ability to read articles, essays, and longer pieces of fictional/nonfictional texts. *Prerequisite: LTSP 2B or equivalent.*

LTSP 2D. Advanced Readings and Composition (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 7. Introductory Intensive Spanish (8)
This course will offer highly intensive Spanish language instruction to beginning language students. The course will enable students to develop basic language skills, to include listening comprehension, speaking, reading and writing, through a total immersion approach, with a focus on the acquisition of language functions. (Offered in Summer Session only.)

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.*

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 the period. May be repeated for credit as topics vary.

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 111. Topics in Golden Age Poetry (4)
Overview of Castilian lyric production from early sixteenth century to late seventeenth century. Close readings of major texts and study of the relationship between poetic forms and social-cultural context. Repeatable for credit when topics vary.

LTSP 115. Topics in Golden Age Prose (Except Cervantes) (4)
Selected readings in the narrative production of the early modern period. Thematic focus and historical period may vary, but major forms such as the picaresque, morisca, and pastoral novel will be covered. Repeatable for credit when topics vary.

LTSP 117. Golden Age Drama (4)
Study of representative examples of early modern Castilian theater. Emphasis on textual analysis of individual plays and the social-cultural meanings of spectacle, especially the comedia and auto sacramental. Repeatable for credit when topics vary.

LTSP 119A. Cervantes: Teatro (4)
Selected readings from Cervantes's dramatic works (entremeses and comedias), with special attention to generic innovations in structure and content. This course fulfills the requirement for Spanish literature majors. *Prerequisites: LTSP 50A and either 50B or 50C.*

LTSP 119B. Cervantes: Novelas Ejemplares (4)
Study of Cervantes's short narrative pieces and their relationship to the development of prose fiction in the early modern period. Special attention to structural and ideological elements. This course fulfills the requirement for Spanish literature majors. *Prerequisites: LTSP 50A and either 50B or 50C.*

LTSP 119C. Cervantes: Don Quijote (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 120. Major Works in the Modern Period: from Feijoo to Galdos (4)
Survey of major figures and movements in Spanish literature from 1700–1880. The selection of works to be studied may vary from year to year, but will always be representative of the main literary and historical developments of this period.

LTSP 122. The Romantic Movement (4)
The 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.

LTSP 124. The Nineteenth-Century Novel (4)
Study of major novelists of the realist tradition. Selection of works and thematic focus may vary.

LTSP 125. The Generation of '98 (4)
The course will explore the significant literary tendencies that arose during the crisis of Spanish society at the end of the nineteenth century and the beginning of the twentieth.

LTSP 127. Modern Drama (4)
Study of significant developments in Spanish theatre of the nineteenth and twentieth century. Selection of works to be studied will vary at the discretion of the instructor.

LTSP 128. Modern Poetry (4)
The course will consider major trends and figures in the development of Spanish poetry throughout the last two centuries. Topics may vary significantly in selection of poets and periods to be studied; thus, course may be repeated for credit when topics vary.

LTSP 129. Twentieth-Century Prose (4)
The course will explore significant aspects of Spanish prose literature in this century. Specific topics will vary by genre (novel, short story, essay) and by period. May be repeated for credit when 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 131. Spanish American Literature: The Colonial Period (4)
A study of the major literary works of the Latin American colonial period as seen against the historical context of that period.

LTSP 132. Spanish American Literature: The Nineteenth Century (4)
A study of the major literary works and problems of the nineteenth century in Latin America as seen against the historical context of that period.

LTSP 133. Spanish American Literature: The Twentieth Century (4)
A study of the major literary works and problems of the twentieth century in Latin America as seen against the historical context of that period.

LTSP 134. Argentine Literature (4)
Study of movements, traditions, key authors, or major trends in Argentine literature, such as gaucho poetry, the realist novel, modern urban narrative, the school of Jorge Louis Borges. May be repeated for credit as topics vary.

LTSP 135. 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. Peruvian Literature (4)
Study of movements, traditions, key authors, or major trends in Peruvian literature, such as the romantic movement, the essay tradition, the rural narrative, the novel of national definition, postmodernist poetry authors such as Vallejo, Arquedas, Vargas Llosa. May be repeated 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 140. Spanish 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. Spanish 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. Spanish 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 143. Spanish American Essay (4)
A study of the essay in Spanish American literature from either an historical or a topical point of view. May be repeated for credit as topics vary.

LTSP 144. Spanish American Theatre (4)
This course studies the representative plays of the major dramatists of Latin America. Discusses and analyzes the dramatic works in light of their historical, social, and cultural background. Considers their contribution to the development of a theatrical tradition in Latin America. May be repeated for credit as topics vary.

LTSP 150. The Development of Chicano Literature (4)
A cross-genre survey of the major works in Chicano literature from its beginnings to the present, with primary emphasis on contemporary works. Speaking, writing, and reading knowledge of Spanish is required.

LTSP 151. Themes and Motifs in Chicano Literature (4)
This course is organized around some of the significant themes and ideas expressed in specific Chicano writings. The importance of these themes to particular Chicano experience is considered. Speaking, writing, and reading knowledge of Spanish is required.

LTSP 152. Chicano Prose (4)
Study of the different genres of Chicano prose: novel, short story, poetry, autobiography. Attention is given to Chicano prose styles and the historical and cultural movement in which they develop. Speaking, writing, and reading knowledge of Spanish is required.

LTSP 153. Chicano Poetry (4)
The analysis and discussion of the major forms and modes of Chicano poetry, with primary emphasis on the developing styles of the poets and on the study of the texts' and the authors' historical moment. Speaking, writing, and reading knowledge of Spanish is required.

LTSP 160. Spanish Phonetics (4)
A comparative study of the English and Spanish phonetics systems. The course will include a study of the organs of articulation, manner of articulation, stress and intonation patterns, as well as dialectal variations in Spanish.

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 163. Spanish Language in America (4)
A study of the history, structure, and peculiarities of the Spanish language in Latin America with selected readings from Latin American authors utilizing these dialects within their works.

LTSP 164. Language and Society (4)
A comparison of language policy in Latin America and that of other Third World countries and its reflection in literature.

LTSP 165. History of the Spanish Language (4)
Historical description of Spanish phonology, morphology, and syntax based on readings of the different periods.

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 discussion of techniques and intensive writing.

LTSP 170. Literary Criticism (4)
The course will discuss major contemporary critical approaches and the question of their applicability to the analysis of contemporary Latin American, Peninsular, and Chicano literature. Open to literature majors only.

LTSP 171. Studies in Literature and Society (4)
Focus on interaction between literary expression and the study of society, covering issues such as the sociology of literature, the historical novel, literature and social change, the writer as intellectual. May be repeated for credit as topics vary.

LTSP 172. Indigenista Themes in Spanish American Literature (4)
Study of the varying literary modes by which nineteenth- and twentieth-century poets and narrators have interpreted the themes of Andean survival in Latin America, primarily in Mexico and the Andean Highlands. May be repeated for credit as topics vary.

LTSP 173. Problems in Spanish and Spanish 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 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 201. Reading Medieval Texts (4)
Introduction to the reading of medieval Spanish. It will provide the student the linguistic and cultural background necessary to go on to more work in depth in the medieval field. May be repeated for credit as topics vary.

LTSP 214. Studies in Medieval Literature (4)
Consideration of one or more major figures, texts, trends, or problems in medieval Spanish literature.

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 226. Cervantes (4)
A critical reading of the Quijote.

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 253. Chicano Literature (4)
Study of the particular life experience of the Chicano and the unique expression given that experience by Chicano authors, whether in novels, short stories, poetry, or dramatic works. May be repeated for credit as topics vary.

LTSP 254. Modern Spanish Poetry (4)
An historical approach to modern Spanish poetry. May be repeated for credit as topics vary.

LTSP 255. The Modern Spanish Novel (4)
An historical approach to the modern Spanish novel. 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 259. Spanish American Poetry (4)
Consideration of one or more major figures, texts, trends, or problems in Spanish American poetry. 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 280. Field Work (4)
Techniques of on-the-spot linguistic and folkloric surveys, including the practice of ballad collections in the Spanish Peninsula. Offered for repeated registration.

LTSP 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 learn and apply forms of argumentation and persuasion as well as such technicalities as referencing systems, style sheets, and bibliographic techniques. May be repeated twice for credit as topics vary. (S/U grades only.)

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

LTTH 100. Introduction to Critical Theory (4)
A critical review of major contemporary theories of the nature of literature, its sociocultural function, and appropriate modes of evaluation.

LTTH 101. Issues in Feminist Theory (4)
The study of selected issues in feminist theory, feminist approaches to literature; and the function of feminist critics in society. May be repeated for credit when topics vary.

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 120. Major Figures (4)
Close study of major critics, as individuals or as groups, from the classical period to the present time. May be repeated for credit when topics vary.

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 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 240. Forms and Genres (4)
Theory as it focuses on the various literary modes–e.g., narratology, poetics, formalism. May be repeated for credit when topics vary.

LTTH 270. Psychoanalytic Approaches to Literature (4)
A systematic study of basic psychoanalytic theory as it applies to literary criticism, with practical psychoanalytical exploration of works from various periods and literatures.

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.

WRITING/LITERATURE

LOWER-DIVISION

LTWR 8A. Craft of Writing: Fiction (4)
Study of fiction in terms of structure and content. Plot, description, character, theme, genre, dialogue, and revision studied through readings from throughout the history of the short story. Practical exercises accompany reading assignments. Prerequisite to upper-division fiction workshops. Students are required to attend at least three Wednesday afternoon readings in the New Writing Series during the quarter. *Prerequisite: students must have completed their college writing requirements prior to enrollment in LTWR 8A.*

LTWR 8B. Craft of Writing: Poetry (4)
Study of poetry in terms of its formal structure and its individual and social function. Techniques of composition (prosody, narrative, personification, performance, metaphor, and image) studied through written and oral examples of this genre. Practical imitations and exercises accompany reading assignments. Students are required to attend at least three Wednesday afternoon readings in the New Writing Series during the quarter. *Prerequisite: students must have completed their college writing requirements prior to enrollment in LTWR 8B.*

LTWR 8C. Craft of Writing: Nonfiction (4)
Study of nonfictional prose in terms of genre and craft. Techniques of composition (journalism, essay, letters, reviews) studied through written examples of the genre. Practical imitations and exercises accompany reading assignments. Prerequisite to upper-division nonfiction prose workshops. *Prerequisite: students must have completed their college writing requirements prior to enrollment in LTWR 8C.*

LTWR 8D. Craft of Writing: Science (4)
Introduction to writing about science, addressed to students campuswide, but especially to those in the sciences who want to write clearly about their discipline. Weekly readings in the fields of medical research, particle physics, genetics, ecology, evolution, and sociobiology, among other subjects. *Prerequisite: students must have completed their college writing requirements prior to enrollment in LTWR 8D.*

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 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 Novel (4)
A workshop designed to encourage writing of longer narrative forms. There will be discussion of student work, together with analysis and discussion of novels from the present and previous ages. May be taken for credit three times. *Prerequisite: LTWR 8A.*

LTWR 106. Translation Workshop (4)
The course centers on issues in the theory and practice of literary translation. Students should be proficient in at least one language other than their native language. Their primary task will be to translate several literary texts and discuss the versions with the instructor and other course members, and they will also do selected readings in translation theory and in published translations. May be taken for credit three times.

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 111. Prose Poem (4)
Although prose poems have been written by writers all over the world, the question of what constitutes a prose poem has never been adequately answered. Through practice, we will explore the inner dynamics central to this mixed genre. *Prerequisite: LTWR 8B.*

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 114. Writing for Television (4)
A workshop course during which students will be expected to devise and write a one-hour drama script for television, either original or conforming to an already existing drama series, and to consider and respond to each other's work. May be taken for credit three times.

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 116. Magazine Writing (4)
This workshop will encourage students to write as well as they can on the sort of topics that appear in today's better magazines. Exercises will stress various techniques, such as the interview, library research, the use of quotations, factual accuracy, style. By the end of the course, each student will have had to complete one full-length article or essay of at least 4,000 words. May be repeated for credit one time.

LTWR 118. Writing for Radio (4)
A workshop in writing for radio. Students will learn basic techniques of scripting, dialogue, news reporting, and feature writing. Evaluation will be based on creative exercise and peer critique. May be repeated once for credit when projects vary.

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. May be taken for credit three times. *Prerequisite: LTWR 8C.*

LTWR 121. Reportage (4)
A workshop designed to encourage the full range of reportage writing: observations, interviews, case studies, profiles, reporter-at-large. Instructor and students will discuss student work and published reportage. May be taken for credit three times. *Prerequisite: LTWR 8C.*

LTWR 122. Writing for the Sciences (4)
A workshop in writing about science as a follow-up on the strategies learned in LTWR 8D. This class will stress 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. *Prerequisite: LTWR 8D.*

LTWR 123. Writing for the Social Sciences (4)
A workshop in the writing of reports (reviews, analyses, field studies, surveys) in the social sciences. Instructor and students will discuss student work, exploring the particular constraints and possibilities of the various forms of social science writing. May be taken for credit three times. *Prerequisite: LTWR 8C.*

LTWR 124. Writing Literary Criticism (4)
A workshop designed to encourage regular writing of literary criticism. Instructor and students will discuss student work. May be taken for credit three times. *Prerequisite: LTWR 8C.*

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.

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 140. History of Writing (4)
A review of the history of the development of alphabets and writing systems. Survey of the rise of literacy since the fifteenth century and analysis of continuing literacy problems in developed and developing countries.

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 146. The Writing of Oral Histories (4)
A methodological and theoretical introduction to the compilation, transcription, and editing of spoken personal and historical narratives. Along with discussions of the relation of orality to writing, students will engage in a number of fieldwork interviews and in their development and completion as publishable written works. Repeatable for credit when topics vary. *Prerequisites: LTWR 8A, 8B, and 8C, or consent of intstructor.*

Directed Study and Special Study

LTWR 180. Senior Writing Workshop (4)
A workshop in any genre to be offered for advanced students. May be repeated for credit when topics vary. *Prerequisite: consent of instructor.*

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 (4)
Directed group study 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.

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 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 273. Practicum on Research in Composing and Written Discourse (4)
In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

LTWR 276. Theory and Research on Literacy (4)
This seminar surveys literature on literacy from perspectives such as education, anthropology, and English studies.

LTWR 280. Graduate Workshop in Imaginative Writing (4)
This course will be a workshop where students will produce work every week to share with the class. Their work will be critiqued in class and in conference with the instructor. They will be expected to complete a substantial body of work, one which is publishable as is. Weekly reading assignments will be required, in order to provide a common basis for discussion of poetics, politics, and process. The purpose of the class is to give those graduate students in literature, who have written

poetry and fiction already, a chance to develop their abilities in those genres. Repeatable for credit when material/instructors vary.

The Making of The Modern World

OFFICE: Eleanor Roosevelt College, Bldg. 412 University Center

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 both Western and non-Western cultures, as well as learn about them. 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) receive 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 small writing laboratory 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.

Students from colleges other than Eleanor Roosevelt may enroll in the sequence if space is available after the initial enrollment period. Such students should consult staff in the program office during the first week of classes regarding space availability.

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 four major classical civilizations of the ancient world, all of which have left legacies to the present. Equal attention will be given to the Ancient Near East, Greece, India, and China. The course covers the great early systems of religious and social thought, using an approach which 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 100 A.D. to 1200 A.D., this quarter concentrates on the development of China from the Han to the Sung Dynasties, the emergence of Christian Mediterranean civilization, 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. European Expansion and the Clash of Cultures (4)
An examination of the world from 1200 to 1700, the quarter first analyzes the structural impact of empire in America, China, Africa, and Europe. It then discusses four major examples of cultural interaction caused by imperial expansion in Europe, South America, and South Asia. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* 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. *Prerequisite: satisfaction of the Subject A requirement.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (W)

6. Our Century and After (4)
Beginning with World War I, this course examines the expansion of state power and conflicts between democratic and anti-democratic forces, along with the social and cultural implications of these developments. It also explores changes in the international system and in the character of warfare. It concludes with a discussion of the notions of world culture and world system. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* Open to Eleanor Roosevelt College students only. (Letter grade only.) (S)

Materials Science

Student Affairs: 2601 Engineering Building I, Warren College

Professors

M. Lea Rudee, Ph.D., ECE, *Program Coordinator*
Gustaf Arrhenius, Ph.D., *SIO*
Robert J. Asaro, Ph.D., *AMES*
Ami Berkowitz, Ph.D., *Physics*
Robert Dynes, Ph.D., *Physics*
Yuan-Cheng Fung, Ph.D., *Emeritus, AMES*
David Gough, Ph.D., *AMES*
Gilbert G. Hegemier, Ph.D., *AMES*
S.S. Lau, Ph.D., *ECE*
Huey-Lin Luo, Ph.D., ECE
M. Brian Maple, Ph.D., *Physics*
Xanthippi Markenscoff, Ph.D., *AMES*
Marc A. Meyers, Ph.D., *AMES*
Stanley Middleman, Ph.D., *AMES*
David R. Miller, Ph.D., *AMES, Associate Dean, School of Engineering*
Hidenori Murakami, Ph.D., *AMES*
Siavouche Nemat-Nasser, Ph.D., *AMES*
Johann K. Oesterreicher, Ph.D., *Chemistry*
Geert W. Schmid-Schoenbein, Ph.D., *AMES*
Ivan K. Schuller, Ph.D., *Physics*
Lu Jeu Sham, Ph.D., *Physics*
Massoud Simnad, Ph.D., *Adjunct/AMES*
Richard Skalak, Ph.D., *AMES,* Director, *Institute for Mechanics and Materials*
Frank E. Talke, Ph.D., *AMES, Department Chair, CMRR Endowed Chair*
Charles W. Tu, Ph.D., *ECE*
Harry H. Wieder, D.Sc., *ECE*

Associate Professors

John E. Crowell, Ph.D., *Chemistry*
Sadik Esener, Ph.D., *ECE*
Frances Hellman, Ph.D., *Physics*
Richard K. Herz, Ph.D., *AMES*
Karen L. Kavanagh, Ph.D., *ECE*
John B. Kosmatka, Ph.D., *AMES*
Joanna McKittrick, Ph.D., *AMES*

Michael J. Sailor, Ph.D., *Chemistry*
Jan Talbot, Ph.D., *AMES*
Kenneth S. Vecchio, Ph.D., *AMES*

Assistant Professors

Teresa L. Cheeks, Ph.D., *ECE*
Edward T. Yu, Ph.D., *ECE*

Materials science is concerned with the study of the structure and properties of materials. The Materials Science 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 Program benefits from unique research facilities existing at UCSD. These include the resources in the Department of AMES, ECE, Physics, Chemistry, 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 modelling of the mechanical response and failure models of advanced materials at ultrahigh strain rates as well as electronic, superconducting, magnetic, and optical properties of materials for advanced applications.

The Graduate Program

The Materials Science Program is interdisciplinary, with participation of faculty members from several departments. 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 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. Faculty from the following departments participate in the graduate Materials Science Program: the Departments of Applied Mechanics and Engineering Sciences (AMES), Physics, Scripps Institution of Oceanography (SIO), Electrical and Computer Engineering (ECE), and Chemistry.

Undergraduate preparation for the materials science M.S. and Ph.D. normally would include a degree in engineering or physical sciences, such as physics, chemistry, geology, and related disciplines. It is expected that interested students would have the adequate mathematics, physics, chemistry and related basic sciences background.

Master's Degree Program

The program offers the M.S. degree in materials science 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 a core of the following six courses:

   (1)MS 227; (2)MS 201A; (3)MS 201B; (4)MS 201C; (5)MS 205A; (6)Physics 152.

   (Physics 211A can replace 152 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 152.
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.

In the case of students who transfer with some graduate credit or an M.S. from another institution, their records will be reviewed by a faculty adviser, and an appropriate individual course of study will be approved by the executive committee.

[redacted]

After completing the M.S. degree or meeting equivalent requirements and meeting the minimum standard on the comprehensive examination to be admitted to 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) approved by the student's potential dissertation adviser.
3. Enroll in MATS200, as required. See "Courses" for descriptions.
4. Present a Research Seminar. This seminar requirement must be completed before scheduling the Ph.D. Qualifying Examination (Senate Exam).
5. Pass an oral examination (Ph.D. Qualifying Examination) to be advanced to 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.)

COURSES

GRADUATE

200. Graduate Seminar (0)
Each graduate student in the Materials Science 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.*

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, electrical, and chemical properties; interactions of dislocations with point defects; hardening by localized obstacles, and precipitation and dispersion hardened alloys. *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.*

206. Mathematical Theory of Dislocations (4)
Dislocations in crystals. The stress field of an isolated dislocation in isotropic and anisotropic elastic materials. Theory of continuously distributed dislocations. Interaction between a dislocation and other defects. Moving dislocations and dislocation dynamics. Dislocation cores. Application of dislocation theory to plasticity of solids, to fracture mechanics, and to dynamic failure processes. *Prerequisite: MS 205A or consent of instructor.*

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.*

211B. Advanced Mechanical Behavior (4)
Rate mechamisms in crystalline solids. Kinetics and dynamics of plastic flow by slip at low and high strain rates. Mechanisms of inelasticity in nonmetals, metals, and polymeric materials. Mechanisms of failure and effects of strain rates. *Prerequisite: MS 211A or consent of instructor.*

212A. Fracture and Failure of Solids (4)
The engineering and scientific aspects of crack nucleation, slow crack growth, and unstable fracture in crystalline and amorphous solids. Dislocation models of cracks. Fatigue and fracture in reactive environments. Dynamic fracturing at high and ultrahigh loading rates. Alloy development and fracture safe design. *Prerequisite: MS 211A or consent of instructor.*

212B. Thermomechanical Properties of Composite Materials (4)
Relationship between structure and thermomechanical properties of composite materials with fiber and particulate reinforcements. Properties of fibers, matrices, and interfaces. Fracture and failure modes under static and dynamic loads. *Prerequisite: MS 212A or consent of instructor.*

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)

213B. Dynamic Behavior of Materials II (4)
Shock induced phase transformations and reactions. Wave propagation through distended materials. Impact; Mie-Gruneisen and other equations of state, the Gurney equation. Detonation theory. Dislocation behavior at high strain rates. Shear instabilities. Spalling and fragmentation. *Prerequisite: consent of instructor.* (W)

217. Nondestructive Testing and Failure Analysis (4)
Survey of nondestructive testing methods and their applications. Analysis of failures of engineering structures and components, with examples of different types of reported failures of materials. *Prerequisite: consent of instructor.*

221. Electronic Materials and Processes (4)
Fermi statistics, occupation of bulk impurity levels; electron transport and electron-phonon interactions; quantum effects in transport phenomenon; physics and chemistry of surfaces and interfaces. *Prerequisite: consent of instructor.*

225. Materials for Magnetic Recording (4)
Magnetic properties of small particles and thin films. Origin of magnetic anisotropy. Switching behavior. Magnetopics. Effect of surfaces on magnetic properties. *Prerequisite: MS 221 or consent of instructor.*

227. Structure and Bonding 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, and space groups will be covered. Simple and complex inorganic compounds will be studied and structure/property comparisons will be made. Structure determination with X-ray diffraction will be discussed. Ionic, covalent, and metallic bonding will be analyzed and compared with physical properties. Atomic and molecular orbitals, bands vs. bonds, and free electron theory are other topics that will be discussed. *Prerequisites: graduate student or consent of instructor; Physics 152 (may be concurrent).*

228. Magnetism, Superconductivity, and the Chemical Bond (4)
Molecules and solids. Localized, collective, and superconducting electrons. Types of magnetic order and moment interactions. Jahn Teller ordering vs. spin orbit ordering. Ionic compounds, ionic compounds with metallic conductivity, metallic compounds. Illustrative examples. Bands, magnetooptic effects. *Prerequisite: consent of instructor.*

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 Technology (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.*

240C. Analytical Electron Microscopy (4)
Concepts of AEM and AEM capabilities, alignment in the AEM. Imaging modes in the AEM (TEM and STEM). Quantitative X-ray microanalysis. Limits of microanalysis. Electron energy loss spectroscopy (EELS). Microdiffraction. Convergent beam electron diffraction (CBED), and high-resolution transmission electron microscopy (HRTEM). *Prerequisite: MS 240B or consent of instructor. The laboratory section will teach the operation of the microscope to conduct material analysis via AEM.*

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.

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 the regular materials science 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.)

Subject to the approval of a faculty adviser, students may also choose from the following courses offered by departments participating in the Materials Science Program (see the relevant pages of this catalog for descriptions):

Applied Mechanics and Engineering Sciences (AMES)

AMES 231A. Foundations of Solid Mechanics (4)

AMES 231B. Elasticity (4)

AMES 231C. Anelasticity (4)

AMES 233A. Fracture Mechanics (4)

AMES 233B. Micromechanics (4)

AMES 233C. Advanced Mechanics of Composite Materials (4)

AMES 234. Experimental Mechanics (4)

AMES 238. Stress Waves in Solids (4)

AMES 256. Rheology of Fluids (4)

AMES 257A. Polymer Processing (4)

AMES 257B. Polymerization Reactor Design (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 231. Thin Film Phenomena (4)

ECE 233. Structure of Solids (4)

ECE 237. Modern Materials Analysis (4)

ECE 239. Nanometer-Scale Probes and Devices (4)

Physics

Phys. 211A. Solid State Physics (5)

Mathematics

OFFICE: 7018 Applied Physics and Mathematics Building, Muir College

Professors

Jim Agler, Ph.D.
Randolph E. Bank, Ph.D.
M. Salah Baouendi, Ph.D.
Edward A. Bender, Ph.D.
James R. Bunch, Ph.D.
Samuel R. Buss, Ph.D., *Vice-Chair*
Peter Doyle, 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.
Carl H. FitzGerald, Ph.D.
Patrick J. Fitzsimmons, Ph.D.
Theodore T. Frankel, Ph.D., *Emeritus*
Michael H. Freedman, Ph.D.
Adriano M. Garsia, Ph.D.
Ronald K. Getoor, Ph.D.
Philip E. Gill, Ph.D.
Leonard R. Haff, Ph.D.
Hubert Halkin, Ph.D., *Emeritus*
Richard S. Hamilton, Ph.D.
J. William Helton, Ph.D.
James P. Lin, Ph.D.
Alfred B. Manaster, Ph.D.
John O'Quigley, Ph.D.
Jeffrey B. Remmel, Ph.D.
Yosef Rinott, Ph.D.
Burton Rodin, Ph.D., *Emeritus*
Helmut Rohrl, Ph.D., *Emeritus*
Murray Rosenblatt, Ph.D., *Emeritus*
Linda Rothschild, Ph.D.
Michael J. Sharpe, Ph.D., *Chair*
Lance W. Small, Ph.D.
Donald R. Smith, Ph.D.
Harold M. Stark, 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., *Vice-Chair*

Associate Professors

Ian S. Abramson, Ph.D.
Frederic Bien, Ph.D.
Bruce K. Driver, Ph.D.
Mark Haiman, Ph.D.
Zheng Xu He, Ph.D.
Hans Lindblad, Ph.D.
Dimitris Politis, Ph.D.
Jeffrey M. Rabin, Ph.D.
John Wavrik, Ph.D.

Senior Lecturers in Mathematics

Patrick J. Ledden, Ph.D., *Provost, Muir College*
Frank B. Thiess, Ph.D., *Emeritus*

Assistant Professors

Kate Okikiolu, Ph.D.
Beth Ong, Ph.D.

Lecturer SOE

Norman A. Shenk, Ph.D.

The Department of Mathematics offers a wide range of courses and programs. These vary in their objectives and levels of required mathematical maturity. In certain courses, the cultural aspects of mathematics are emphasized, and the prerequisites are minimal. In others, the scientific and technical aspects are paramount, and the prerequisites are considerable. In making selections, students are advised to keep in mind their particular objectives and backgrounds.

As of fall 1995, the Department of Mathematics changed the calculus sequence, replacing the six quarters of the Math. 2 sequence with a new sequence, Math. 20A-F. Math. 20A, 20B, and 20F are more or less equivalent to Math. 2A, 2B, and 2EA respectively, though the emphasis in Math. 20A and 20B is somewhat different from Math. 2A and B. The material of Math. 20C covers parts of the topics formerly covered in Math. 2C and 2D/2DA. Math. 20D and E will cover vector calculus. *Note that Math. 20A and 20B are prerequisites to all other courses in the Math. 20 sequence.*

Math. 2A, 2B, 2C, 2DA, 2EA and 2F will not be offered after spring quarter 1994. Math. 21C, which will be offered in spring quarter only, has exactly the same content as the former Math. 2C; Math. 21D, offered in fall quarter only, has the same content as the former Math. 2DA.

Students who have completed part of the Math. 2 sequence by spring 1994, and who wish to complete the lower-division calculus sequence, should consult the table below for the proper entry points into the Math. 20 sequence. Students with majors other than mathematics should consult their departments for changes in their mathematics requirements brought about by these modifications.

Engineering students in particular may be required to take these courses in a sequence designed specifically for their majors.

No Math. 2 course will be offered after spring 1995. Students who need to retake a Math. 2 course after it is no longer offered will be permitted to use the following "retake equivalence chart."

To retake:	Substitute course:
Math. 2A	Math. 20A
Math. 2B	Math. 20B
Math. 2C	Math. 21C
Math. 2EA	Math. 20F
Math. 2DA	Math. 21D
Math. 2F	Math. 20E

In other cases, the student should consult the Department of Mathematics Undergraduate Office or a mathematics adviser.

First-Year Courses

During orientation, each freshman is given an examination to determine that student's level of mathematics preparation for the department's calculus courses. Before orientation, students should briefly review their mathematics so that their test performance accurately reflects their competence. The examination results will be used to assist the student in selecting a starting point in the mathematics program. Some students will be required to take precalculus courses before beginning a calculus sequence.

A course in college algebra is offered on the UCSD campus by a community college in cooperation with the department. This course is designed both for students who need a preparatory course before beginning the Math. 1 sequence and for students who plan to enroll in the Math. 20 sequence but need to strengthen their algebraic skills and facility in graphing and working with exponential and logarithmic functions before enrolling in Math. 4C. Math. 4C is the department's preparatory course for the Math. 20 sequence, providing a brief review of the material in the college algebra course followed by an introduction to trigonometry and a more advanced treatment of graphing and functions.

Math. 1A-B-C is one of two calculus sequences. The students in this course have completed a minimum of two years of high school mathematics. This course is acceptable for majors in liberal arts, economics, and some of the majors in biology. 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 Fifth College.

The other first-year calculus sequence, Math. 20A, 20B, and 20C, 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. 1A-1B-1C and is required of many majors, including biochemistry, cell biology, molecular biology, mathematics, chemistry, AMES, CSE, ECE, and physics. Students with adequate backgrounds in mathematics are strongly encouraged to take Math. 20 since Math. 1 is inadequate preparation for many later courses in science and economics.

Certain transfers between the Math. 1 and Math. 20 sequences are possible, but such transfers should be carefully discussed with an adviser. Able students who begin the Math. 1 sequence and who wish to transfer to the Math. 20 sequence, may follow one of three paths, the first of which is highly recommended over the others:

1. Follow Math. 1A with Math. 20A, with two units of credit given for Math. 20A. This option is not available if the student has credit for Math. 1B or Math. 1C. This option is available only if the student obtains a grade of A in Math. 1A.
2. Follow Math. 1B with Math. 20B, receiving two units of credit for Math. 20B.
3. Follow Math. 1C 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. 1 and the Math. 20 sequence.

Electives for Non-Majors

The department offers a number of courses (Math. 10, 13, 15, 17, 93) with minimal prerequisites that are intended primarily for nonmajors. A few upper-division courses are suitable for well-motivated students who have completed Math. 20C and wish to sample more advanced mathematics. Math. 104A, 117, 120A (depending on instructor), 151, 163, 183, do not make serious use of sophomore-level calculus.

Major Programs

The department offers four different majors: (1) mathematics, (2) applied mathematics, (3) applied mathematics (scientific programming), and (4) mathematics-computer science. 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 with the exception of 183. (Note: 195, 196, 198, and 199 cannot be used towards a major.) All courses used to fulfill the major must be taken for a letter grade.

It is strongly recommended that mathematics majors review their programs at least annually with a faculty adviser, and that they consult a faculty adviser before making any changes to their programs. The department holds a quarterly meeting for majors where general information is discussed. It is strongly advised that each major open an e-mail account and register it at the department's undergraduate office. Notification of course changes and of available positions are distributed to e-mail first.

Secondary School Mathematics Teaching

A mathematics major offers excellent preparation for teaching Math in the secondary schools. If you are interested in earning a California teaching credential from UCSD, contact the Teacher Education Program for information about the prerequisites and professional preparation requirements. It is recommended that you contact TEP as early as possible in your academic career.

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 physical and behavioral sciences and the humanities.

All students majoring in mathematics must complete the basic 20 sequence. Math. 89 should be taken in the spring quarter of the sophomore year, but may be taken in the fall, concurrently with Math. 140A, 100A, or 103A. In addition to these lower-division courses, mathematics majors must complete at least twelve one-quarter, upper-division courses including:

1. 140A-B
2. 100A-B or 103A-B
3. Two complete sequences from the following list: 100A-B-C, 103A-B-102, 104A-B-C, 110-120A-B, 111A-B, 110-130A-B, 110-132A-B, 140A-B-C, 150A-B-C, 160A-B, 170A-B-C, 171A-B, 180A-B-C, 180A-181A-B (181C, D, or E may substitute for 181B), 141-190-191.

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. 89 before the end of their sophomore year. Either Math. 140A-B or 100A-B (103A-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. Students considering this major should obtain the department's list of requirements on applied mathematics. See also requirements for all major programs.

All students majoring in applied mathematics are required to complete the following courses:

1. Calculus: 20 sequence (Math. 89 should be taken in sophomore year).
2. Programming:
   Fortran (AMES 10) or C++ (CSE 10) or (CSE 5AB).
3. Linear Algebra: Math. 102 or 170A.
4. Statistics: 183 or 181A. Note: Math. 183 cannot be used toward the 52 required upper-division units.
5. Advanced Calculus: Math. 142A-B (or 140A-B). (Math. 142A-B should be taken during the junior year).
6. One of the following sequences: 180A-B-C (probability), 180A-181A-B* (probability and statistics), or any three courses from 170A-B-C, 172, and 173 (numerical analysis). [*Math. 181C, D or E may be substituted for 181B.]
7. One additional sequence which may be chosen from the list (#6) above or the following list: 110-120A-130A, 111A-B, 120A-B, 130A-132A, 155A-B, 171A-B, 184A-B, 193A-B.

At least fifty-two upper-division units must be completed in mathematics, except:

a. Up to twelve units may be outside the department in an approved applied mathematical area. A petition approved by an applied math adviser is required. No such units may also be used for a minor or program of concentration.
b. AMES 154, Econ. 120A-B-C, Math. 183, 195, 196, and 199 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. 89 before the end of their sophomore year.

Major in Applied Mathematics (Scientific Programming)

This is a specialized applied mathematics program with a concentration in scientific programming, i.e., computer solution of scientific problems. The requirements are those of the applied mathematics major, except for the following additions and substitutions:

1. Physics 1A-B-C, or 2A-B-C, or 4A-B-C
2. Instead of (#6) and (#7) in the applied mathematics major, the following courses are required:
   (#6) any three from 170A-B-C, 172, 173
   (#7) 171A-B
3. 103A-B (100A-B may be substituted)
4. 184A
5. 176A-B
6. 166A
7. 180A
8. 188 or CSE 101
9. One of the two areas of concentration:
   I. Numerical Computing
      a) 170A
      b) Three one-quarter courses chosen from: 170B, 170C, 172, 173
      c) Two additional one-quarter courses from: 102, 110, 111A-B-C, 171A-B, 130A-B, 131, 132A-B, 140A-B, 142A-B, 180 B-C, 181A-B, 185
      d) One mathematics-related elective
   II. Non-Numerical Computing
      a) Two from 174, 170A-B-C, 172, 173
      b) 189A-B or CSE 131A-B
      c) Two from: 140A-B, 142A-B, 176B, 186B, 179A-B, 155A-B, 184B, 166B, 168A-B, 187, 189C, 160A-B, CSE 120-121, CSE 140-141, CSE 130
      d) One mathematics-related elective

In order to graduate by the end of their senior year, students must complete Math. 103A, 103B, 166A, 176A, and 186A by the end of their junior year.

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.

The curriculum for the B.A. in mathematics-computer science requires thirty-six units of lower-division courses and sixty units of upper-division courses. Of these sixty units, fifty-six units are required courses and four units are elective courses. A 3.0 average in the courses in item #1 is required for admission to the major. See requirements for all major programs.

The detailed curriculum is given in the following list.

Required Courses:

1. 20 sequence.
2. 89 or 79B
3. One of 79A, CSE 5A-B, CSE 10. CSE 11
4. 79B or CSE 30

Minor in Mathematics

The minor in mathematics (for all colleges) consists of a total of six or more courses, taken from the UCSD Mathematics Department, of which at least three are upper-division courses. Acceptable lower-division courses are Math. 20D, 20E, 20F, 79A, 79B, and Math. 89. At least two of the upper-division courses must be from a single sequence as described for the mathematics, applied mathematics, or mathematics-computer science major. As with the mathematics major, Math. 183, 195, 196, 198, and 199 are not considered upper-division courses for the mathematics minor.

For a class to count toward the minor, a grade of C– or better (or P if the Pass/Not Pass option is used) is obligatory. There is no restriction on the number of classes taken with the P/NP option.

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. 1A previously/0 if Math. 1A concurrently/0 if Math. 1B or 1C]" means that a student already having credit for Math. 1A will receive only two units of credit for Math. 20A, but will receive no units if he or she has credit for Math. 1B or 1C, and no credit will be awarded for Math. 20A if Math. 1A is being taken concurrently. Math. 4C cannot be taken for credit after Math. 1 or Math. 20.

1. Math. 20A [2 if Math. 1A previously/0 if Math. 1A concurrently/0 if Math. 1B or 1C]
2. Math. 20B [2 if Math. 1B or 1C previously/0 if Math. 1B concurrently]
3. Math. 21C [2 if Math. 1C previously/0 if Math. 1C concurrently]
4. Math. 10 [0 if Soc. Sci. 60 or Psych. 60 or Math. 13]
5. Math. 13. [0 if Soc. Sci. 60 or Psych. 60 or Math. 10]
6. Math. 103A-B [0 if Math. 100A-B], Math. 142A-B [0 if Math. 140A-B]
7. Math. 155A [0 if CSE 167]
8. Math. 180A [2 if Econ. 120A or Math. 183 previously/0 if Econ. 120A or Math. 183 concurrently]
9. Math. 181A [2 if Econ. 120B/0 if Econ. 120B concurrently]
10. Math. 183 [0 if Econ. 120A]

For duplication or repeat of credit guidelines between the Math. 20 sequence, refer to the section titled "The Undergraduate Program."

Advisers

Advisers change yearly. Contact the undergraduate office at (619) 534-3590 for the current list.

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 applicants to 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

Five written departmental examinations are offered in two areas (refer to "Ph.D. in Mathematics" for list of exams). A student must complete two examinations, one from each group, with a master's pass.

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 selected 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)

230A-B-C. (Ordinary 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 compromise 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 as a combined total 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 five subjects. These are grouped into two 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)

A student is required to pass (at the Ph.D. level) two qualifying examinations, one from each area. Department policy stipulates that one of the exams must be completed at the end of the first year, and the other following the second year of study. Anyone unable to comply with this schedule will be terminated from the doctoral program and transferred to one of the master's programs.

Any master's student can submit for consideration a written request to transfer into the Ph.D. program when two qualifying exams are passed at the Ph.D. level and a dissertation adviser is found. Approval by the Qualifying Exam and Appeals Committee (QEAC) is not automatic, however.

These 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. No exam may be taken more than twice, and no more than four attempts are allowed to pass the required two examinations.

Based on an individual's background and proposed area of study, a faculty adviser determines a third requirement. This could consist of

a seminar presentation, additional course work or completion of an examination.

FOREIGN LANGUAGE REQUIREMENT

A reading knowledge of two foreign languages (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

1A. Elements of Mathematical Analysis (4)
Differentiation and integration of algebraic functions. Fundamental theorem of calculus. Applications. Three lectures, one recitation. (Credit not given if Math. 2A/20A previously completed.) Three lectures, two recitations. *Prerequisites: passing score on placement examination and either two or more units of high school mathematics or equivalent. One-half unit of trigonometry is desirable.* (F,W,S)

1B. Elements of Mathematical Analysis (4)
Further applications of the definite integral. Calculus of trigonometric, logarithmic, and exponential functions. Complex numbers. (Credit not given if Math. 2B/20B previously completed.) Three lectures, one recitation. *Prerequisite: Math. 1A.* (F,W,S)

1C. Elements of Mathematical Analysis (4)
Vector geometry, velocity and acceleration vectors. Partial derivatives, multiple integrals. Exact differentials. (Credit not given if Math. 2C/20C previously completed.) Three lectures, one recitation. *Prerequisite: Math. 1B.* (F,W,S)

3C. Pre-calculus for Life Sciences and Social Sciences (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. *Prerequisite: qualifying score on placement test.* No credit given if credit has been given for other mathematics course. If Math. 4C is taken after Math. 3C, it will be worth only 2 units.

4C. Elementary Functions (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. *Prerequisite: qualifying score on placement examination. With a superior performance in the community college algebra course offered on the UCSD campus, the placement examination requirement may be waived. (Cannot be taken for credit after Math. 1 or Math. 2/20.)* (F,W,S)

10. Statistical Inference and the Game of GO (4)
Descriptive statistics and random variables. Expected value calculations within the context of gambling games and GO problems. Standard distributions derived from the normal distribution. Confidence intervals and tests. Introduction to experimental design through the analysis of GO openings. Four lectures, one recitation. *Prerequisite: intermediate or college algebra.* (Credit not offered for both Math. 10 and Soc. Sci. 60 or Psych. 60 or Math. 13.)

13. Chance (4)
Provides case-study examinations of current issues requiring for their understanding analyses of chance events. Typical issues are clinical trials, reliability of opinion polls, statistical issues with AIDS, streaks in sports, DNA fingerprinting, and gambling in the casino and stock market. Three lectures, one recitation. *Prerequisite: intermediate or college algebra.* (Credit not offered for both Math. 13 and Soc. Sci. 60 or Psych. 60 or Math. 10.)

15A-B. Introduction to Discrete Mathematics (4-4)
Introduction to mathematical structures encountered in our computer-oriented world. Emphasis on concrete examples rather than on general theory. Topics may include combinatorial structures, formal languages (permutations, lattice paths), generating functions (partitions, recurrence relations), graph theory (trees, chromatic polynomials) and information theory (codes, sorting). *Prerequisite: Math. 4C or equivalent.*

17. Geometry and the Imagination (4)
Down-to-earth approach to deep mathematical ideas, emphasizing the richness, diversity, connectedness, and pleasure of mathematics. Assignments emphasize thinking and writing. Discussions and projects replace traditional lectures and exams. Accessible to enthusiastic students of widely varying backgrounds. Topics: see Math. 117. *Prerequisite: calculus occasionally helpful but not necessary.*

20A. Calculus (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. *Prerequisite: passing score on placement examination or completion of Math. 4C with a grade of B or better.*

20B. Calculus (4)
Integral calculus of one variable and its applications, with exponential, logarithmic, hyperbolic, and trigonometric functions. Methods of integration. Polar coordinates in the plane. *Prerequisite: Math. 20A or equivalent / Score of 4 or better on AB calculus AP test.*

20BL. Honors Mathematics Laboratory (2)
Symbolic, numerical, and graphical explorations of the material of Math. 20B. Student should have received a grade of A– or better in Math. 20A (or equivalent course). *Prerequisite: Math. 20A with corequisite of Math. 20B or consent of instructor.* (W)

20C. Calculus (4)
Taylor polynomials. Infinite series. Elementary aspects of multivariable calculus. Extrema. Lagrange multipliers. Double integrals. Introduction to ordinary differential equations. First order separable and linear equations. Second order equations with constant coefficients. *Prerequisite: Math. 20B or equivalent.*

20CL. Honors Mathematics Laboratory (2)
Symbolic, numerical, and graphical explorations of the material of Math. 20C/21C. Student should have received a grade of A– or better in Math. 20B (or equivalent course). *Prerequisite: Math. 20B with corequisite of Math. 20C/21C or consent of instructor.* (S)

20D. Differential Equations and Vector Calculus (4)
Series, convergence tests. Series solutions and Laplace transform methods for differential equations. Algebra and geometry of vectors, dot and cross product. Parametric curves in the plane and in space, tangent and normal. Gradient. *Prerequisite: Math. 20C or equivalent.*

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, Stokes' theorem. Gauss' theorem and its applications. Conservative fields. *Prerequisite: Math. 20D (or 21D) 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. *Prerequisite: Math. 20B. Math. 20D strongly recommended.*

21C. Calculus and Analytic Geometry (4)
Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double integration. *Prerequisite: Math. 20B or equivalent or consent of instructor.*

21D. Introduction to Differential Equations (4)
Infinite series. Ordinary differential equations: exact, separable, and linear; constant coefficients, undetermined coefficients, variation of parameters. Series solutions. Systems, Laplace transforms. Techniques for engineering sciences. *Prerequisite: Math. 21C or equivalent or consent of instructor.*

74. Scientific Application of Computers (4)
Introduction to elementary numerical analysis with emphasis on computer applications. Systems of linear equations, interpolation, extrapolation, polynomial fits to data, root finding, numerical differentiation, and integration. Three lectures, one recitation. *Prerequisites: Math. 20B and CSE 10 or equivalent course emphasizing structured programming approved by the instructor.*

79A-B. Structure of Programs (4-4)
This is an honor sequence for mathematically sophisticated students. Building abstractions with procedures and data. Iteration, recursion, hierarchical data, generic operators. Modularity, objects and state metalinguistic abstraction. Lambda calculus and functional programming. Three lectures, one recitation. *Prerequisites: Math. 20C and a 3.5 average in two courses in the UCSD Math. 20 sequence or consent of instructor.*

89. Proseminar (4)
A course emphasizing the analysis and writing of proofs and other mathematical expositions, with topics chosen from calculus, linear algebra, set theory, and finite mathematics. Required of all pure mathematics and mathematics/computer science majors and recommended for applied mathematics and scientific programming majors. Three lectures and one recitation section. *Prerequisite: Math. 20F.* (F,S)

93. Theory of Interest (4)
Interest, annuities, amortization, sinking funds, bonds, and other securities. Preparation for actuarial exam 140. *Prerequisite: Math. 1C or Math. 20B.*

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. 89 (may be taken concurrently).* (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. 89 (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.*

108. Problem Solving (4)
Development of topics in algebra, geometry, probability, combinatorics, number theory, etc., as needed for solving nonroutine problems. May be repeated for credit. Three lectures. *Prerequisite: GPA better than 3.5 in Math. 20A, 20B, 20C/21C, 21D, 20F or consent of instructor.*

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-C. Mathematical Model Building (4)
Analytic techniques and simulation methods will be used to study a variety of models. Students will work on independent projects. Three lectures. *Prerequisites: Math. 20D (21D) and 20F.*

117. Geometry and the Imagination for Math Majors (4)
Enhanced Math. 17 for advanced mathematics students. Topics: Geometry and topology in dimensions 2, 3, and higher; polyhedra; Euler characteristic; hyperbolic geometry; knots; symmetry; orbifolds; the 17 kinds of wall paper; curvature; soap films; telling cabbage from kale; Gauss-Bonnet theorem. *Prerequisite: Math. 20C/21C or equivalent.*

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. 20E and Math. 89 (may be taken concurrently). Credit cannot be obtained for both Math. 140A-B and 142A-B.* (F,W,S)

141. Introduction to Abstract Analysis (4)
General topological spaces, compactness, separation, locally compact Hausdorff spaces, metrization, completeness, Baire category, Stone-Weierstrass theorem, function spaces. Three lectures. *Prerequisites: Math. 140A-B or equivalent.* (F)

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. *Prerequisite: Math. 20E.* 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-C. Calculus on Manifolds (4-4)
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)

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)

155C. Topics in Computer Graphics (4)
Tensor product and Bezier patch surfaces, perspective transformations, projective cross ratios, elevation of degree, derivatives across edges, calculation of illumination intensity. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisite: Math. 155B or consent of instructor.* (S)

160A-B-C. Elementary Mathematical Logic (4-4-4)
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.*

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 103A, or consent of instructor.* (S)

166A-B. Theory of Computability (4-4)
An introduction to the mathematical theory of computability, including formal treatment. Finite automata and regular expressions. Context-free languages and push-down automata. Turing machines and recursive functions. Church's thesis. Unsolvable problems. Further topics selected from computational complexity, arithmetical relations, word problems. Three lectures, one recitation. *Prerequisite: Math. 103A or 100A, or consent of instructor.* (S,F)

168A-B. Topics in Applied Mathematics-Computer Science (4-4)
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 integration. Ordinary differential equations and their numerical solution. Basic existence and stability theory. Difference equations, numerical methods, and error propagation. Boundary value problems. Three lectures, one recitation. *Prerequisites: Math. 20D/21D and 20F and knowledge of programming.* (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. *Prerequisite: Math. 102 or 170A.* (W,S)

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.* (F)

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, ordinary differential equations, nonlinear equations, optimization, least squares. Three lectures and one recitation. Students may not receive credit for both Math. 174 and Physics 105 or AMES 153 or 154. Students may not receive credit for Math. 174 if Math. 170 A,B, or C has been taken already. *Prerequisites: Math. 20F and knowledge of FORTRAN.* (F)

176A-B. Computer Implementations of Data Structures (4-4)
Introduction to the use of data structures in computer implementation of combinatorial algorithms. This course is designed to give students hands-on experience with these fundamental tools of computer science. Part A covers dictionaries, heaps, priority queues, hashing structures, balanced and self-adjusting trees. Part B includes selected applications to sorting, searching, string processing, elementary parsing, geometric and graph algorithms. Three lectures. *Prerequisites: Math. 20E, Math. 100A or 103A (may be taken concurrently), Math. 79B or CSE 70.*

179A-B. Introduction to Artificial Intelligence (4-4)
An introduction to artificial intelligence through its mathematics. The course will develop various areas of mathematics, including logic, probability and optimization. These tools will be applied to various areas of artificial intelligence, including deductive reasoning, uncertain reasoning, neural networks and search. One of the programming languages Prolog and Lisp will be introduced and used for course work. *Prerequisite: Math. 89, 100A or 103A (100A or 103A may be taken concurrently).* (W,S)

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. This course is recommended for students in science and engineering. Three lectures, one recitation. This course may not be used to satisfy upper-division course requirement for any mathematics major. (Credit not offered for both Math. 183 and Econ. 120A.) *Prerequisite: Math. 20C/21C.* (F,S)

184A-B. Mathematical Foundations of Computer Science (4-4)
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. 100B or Math. 103B.* (F,W)

185. Introduction to Computational Statistics (4)
Statistical analysis of data by means of package programs. Regression, analysis of variance, discriminant analysis, and analysis of categorical data. Emphasis will be on understanding the connections among statistical theory, numerical results, and analysis of real data. Three lectures. *Prerequisite: Math. 181B or equivalent.*

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)
Design and analysis of algorithms, with emphasis on nonnumerical algorithms. Paradigms and heuristics. Measuring complexity of algorithms, time, and storage. Three lectures. *Prerequisites: Math. 103B, 176A, 180A, 184A, and 186A.* (S)

189A-B-C. Compilers (4-4-4)
Compilers for high-level programming languages. Project to develop a working compiler. Part A: regular expressions and finite automata, context free grammars, parsing techniques. Part B: syntax directed translation, semantic actions (for declarations, statement structures, assignments, array references, expression evaluation, procedure and function calls), symbol tables, run-time storage management. Part C: error recovery, optimization, code generation. Three lectures. *Prerequisites: Math. 166A, 176A, and 103A or consent of instructor.* (F,W,S)

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. 89 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.*

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).*

198. Directed Group Studies in Mathematics (1 to 4)
Group study course in some topic not covered in the undergraduate curriculum. (P/NP grades only.) *Prerequisite: consent of instructor.* (F,W,S)

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)

GRADUATE

200A-B-C. Algebra (4-4-4)
Group theory. Jordan-Holder theorem, Sylow theorems. Rings, polynomial rings, principal ideal domains, radicals, Wedderburn theorems, Hilbert Basis theorem. Modules, exact sequences, projective modules, tensor products. Fields, algebraic and transcendental extensions, algebraic closure, finite fields. Galois theory, fundamental theorem, solvability by radicals. *Prerequisites: Math. 100A-B-C or consent of instructor.* (F,W,S)

201A-B-C. Basic Topics in Algebra (4-4-4)
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)

202A-B-C. Applied Algebra (4-4-4)
Selected topics in applied mathematics that are principally algebraic in nature, Boolean algebras, group codes, polynomial rings and polynomial codes, selected applications of finite fields, recurrent sequences, switching theory, finite state machines. *Prerequisites: Math. 103A-B or Math. 100A-B.* (F,W,S)

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)

204A-B-C. Topics in Number Theory (4-4-4)
Topics in number theory, such as algebraic number theory, cyclotomic and Kummer extensions, class number, units, splitting of primes in extensions, zeta and L-functions, Tchebotarev density theorem, prime ideal theorem, Brauer-Siegel theorem, class field theory (abelian extensions, reciprocity laws), p-adic numbers, adeles, number theory of simple algebras, diophantine equations and approximation, quadratic forms, Hasse-Minkowski theorem, Siegel theorem, automorphic forms, and applications such as Kronecker limit formula, Rademacher's result on the partition function. *Prerequisite: consent of instructor.* (F,W,S)

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)

215A-B-C. Mathematical Theory of Process Optimization (4-4-4)
Optimal control problems for systems described by nonlinear differential equations, necessary conditions, sufficient conditions; existence theorems, applications to classical calculus of variations and to problems in electrical and aerospace engineering. Optimal control problems for systems described by nonlinear difference equations, applications to the theory of optimal economic growth. *Prerequisites: Math. 241A-B-C or consent of instructor.* (F,W,S)

217A-B-C. Topics in Applied Mathematics (4-4-4)
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.*

218. Seminar in Applied Mathematics (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

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-C. Topics in Several Complex Variables (4-4-4)
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-C. Topics in Complex Analysis (4-4-4)
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.*

228. Seminar in Complex Analysis (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

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.*

230A-B-C. Ordinary Differential Equations (4-4-4)
Existence and uniqueness theorems. Linear systems with constant and periodic coefficients. Sturm-Liouville theory. Eigenfunction expansions. Stability and asymptotic behavior of nonlinear systems. Poincare-Bendixson theorem. Perturbation theory. Linear systems in the complex domain and their singularities. Control theory. Equations in Banach space. *Prerequisites: Math. 130A-B and 220A-B or consent of instructor.*

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.*

232A-B-C. Calculus of Variations (4-4-4)
Euler-Lagrange equation theory of fields, Hamilton-Jacobi theory, sufficient conditions, Weierstrass E test. Mayer, Lagrange and Boza problems. Optimal control, Pontryagin's maximum principle, existence theorems, sufficient conditions. Caratheodory's approach to calculus of variations. *Prerequisites: Math. 240A-B-C or Math. 210A-B-C.* (F,W,S)

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.*

238. Seminar in Differential Equations (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

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-C. Functional Analysis (4-4-4)
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.*

242. Topics in Fourier Analysis (4)
A course on Fourier analysis in Euclidean spaces, groups, symmetric spaces. *Prerequisites: Math. 240A-B-C or consent of instructor.* (F,W,S)

247A-B-C. Topics in Real Analysis (4-4-4)
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-B-C. Topics in Differential Geometry (4-4-4)
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)
Prerequisite: consent of instructor. (S/U grades permitted.)

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-C. Mathematical Logic (4-4-4)
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-C. Combinatorial Algorithms (4-4-4)
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-C. Topics in Combinatorial Mathematics (4-4-4)
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)

265A-B-C. Topics in Algorithmic Combinatorics (4-4-4)
Advanced topics in combinatorial algorithms and the application of combinatorial methods to computer science. Topics chosen from algorithmic methods in enumerative combinatorics, graph theory, group theory, matroid theory, coding theory, cryptography, and subjects in computer science that involve applications of these areas. May be repeated for credit with consent of adviser. Three lectures. *Prerequisites: Math. 261A-B or consent of instructor.* (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)
The analysis of the complexity of matrix computations and the parallel implementation of numerical algorithms: fast matrix

multiplication and inversion, fast Fourier transform, communication schemes, gradient and multilevel methods. *Prerequisite: knowledge of programming and some numerical analysis or computer science, or consent of instructor.* (F,W,S)

277A-B-C. Topics in Numerical Mathematics (4-4-4)
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-B-C. Mathematical Statistics (4-4-4)
Testing and estimation, sufficiency; regression analysis; sequential analysis; statistical decision theory; nonparametric inference. *Prerequisites: advanced calculus and 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.)

285. Statistical Inference in the Medical and Biological Sciences (4)
A first course in statistical procedures for the medical and biological sciences. Topics will be chosen from among experimental design, counts, regression and correlation, analysis of variance, survivorship, classification. Some emphasis will be given to computational techniques. *Prerequisite: consent of instructor.* (This course offered only to graduate students in the medical or biological sciences and to medical students.) (W)

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)
Bivariate and more general multivariate normal distribution. Study of tests based on Hotelling's T2. Principal components, canonical correlations, and factor analysis will be discussed as well as some competing nonparametric methods, such as cluster analysis. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

287C. Nonparametric Analysis (4)
Topics covered will include the Mann-Whitney and Wilcoxon, sign, median, and Kruskal-Wallis tests; permutation methods in general; tests for goodness of fit, especially those based on chi-square and Kolmogorov-Smirnov statistics. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

287D. Sequential Analysis (4)
This course will include the Wald sequential probability ratio test, operating characteristics of various sequential tests beyond the SPRT. The sequential estimation of parameters and confidence intervals and empirical Bayes methods will be discussed. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

288. Seminar in Probability and Statistics (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

289A-B-C. Topics in Probability and Statistics (4-4-4)
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)

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.*

297A-B-C. Topics in Topology (4-4-4)
In recent years, topics have included generalized cohomology theory, spectral sequences, K-theory, homotopy theory. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.* (F,W,S)

298. Seminar in Topology (1 to 4)
Prerequisite: consent of instructor. (S/U grades permitted.)

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: 3060 Urey Hall Addition

Professors

Donald W. Anderson, *Computer Science and Engineering (CSE)*
Ted J. Case, *Biology*
Paul M. Churchland, *Philosophy*
Michael Cole, *Communications*
Melvin Green, *Biology*
Barbara Jones, *Physics*
Douglas Magde, *Chemistry and Biochemistry*
Alfred B. Manaster, *Mathematics*
Hugh B. Mehan, *Sociology*
Douglas W. Smith, *Biology*

Associate Professor

Norman A. Shenk, *Mathematics*

Assistant Professor

John Batali, *Cognitive Science*

Lecturers (SOE)

Barbara A. Sawrey, *Chemistry and Biochemistry*
Gabriele Wienhausen, *Biology*

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 Departments of Biology, Chemistry and Biochemistry, Cognitive Science, Communications, Computer Science and Engineering, Mathematics, Philosophy, Physics, 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 course work. 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.

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.

Middle East Studies

OFFICE: 3071 Humanities and Social Sciences Building, Muir College

Faculty

Guillermo Algaze, *Associate Professor, Anthropology*
Suzanne Brenner, *Assistant Professor, Anthropology*
David Noel Freedman, *Professor, History*
Richard Friedman, *Professor, Literature*
Ali Gheissari, *Assistant Professor, Sociology*
David Goodblatt, *Professor, History*
Hasan Kayali, *Assistant Professor, History*
Thomas Levy, *Professor, Anthropology*
Timothy McDaniel, *Professor, Sociology*
Michael E. Meeker, *Professor, Anthropology*
William H. Propp, *Associate Professor, History*
Gershon Shafir, *Professor, Sociology*
Melford E. Spiro, *Professor Emeritus, Anthropology*
Winifred Woodhull, *Associate Professor, Literature*
Oumelbanine Zhiri, *Assistant 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 six courses, of which at least three must be upper-division courses dealing with the Middle East since the emergence of Islam, as listed here under "Core Courses." The remaining three courses may be lower- or upper-division courses 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. Ordinarily all six 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 162. Peoples 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)
LTGN 185. Gender and Decolonization in North African and French Literature
Soc./D 158. Islam in the Modern World
Soc./D 188F. Modern Jewish Societies and Israeli Society
Soc./D 188H. Middle Eastern Societies
Soc./D. 188L. State and Society in Modern Iran.
Soc./D 188M. Historical Sociology of the Middle East
Soc./E 190. Senior Seminar (Middle East Topics)
Soc./E 199. Independent Study (Middle East Sociology)

SUPPORTING COURSES

ANLD 11. Human Origins: World Prehistory
ANGN 100. Origins of Agriculture and Sedentism
ANGN 101. Chiefdoms, States, and the Emergence of Civilizations
ANGN 102. Early Urbanism
ANGN 105. Ethnoarchaeology
ANRG 101. Near Eastern Pre-History
ANRG 116. Archaeology of Society in Syro-Palestine
ANRG 182. Ethnography of Island Southeast Asia
Judaic Studies 1. Beginning Hebrew
Judaic Studies 2. Intermediate Hebrew
Judaic Studies 3. Intermediate Hebrew Continued
Judaic Studies 101. Introduction to Hebrew Texts
Judaic Studies 102. Intermediate Hebrew Texts
Judaic Studies 103. Advanced Hebrew Texts
HINE 100. The Ancient Near East and Israel
HINE 101. Hebrew Prophetic Literature
HINE 102. The Jews in Their Homeland in Antiquity
HINE 103. The Jewish Diaspora in Antiquity
HINE 104. The Bible and the Ancient Near East
HINE 160. Special Topics in the Bible and Ancient Near East
HINE 170. Special Topics in Jewish History
HINE 180. Cultures of Ancient Near East
HINE 181. Problems in the Study of Hebrew Manuscripts
HINE 199. Independent Study (Judaic Studies)
HITO 100. Ancient Religions
HITO 101. Western Religions (Judaism, Christianity, Islam)
LTHE (LTGN) 151. Bible: The Prophetic Books
LTHE (LTGN) 152. Bible: The Narrative Books
LTHE (LTGN) 153. Bible: The Poetic Books
LTHE (LTGN) 156. Topics in the Prophets
LTHE (LTGN) 157. Topics in Biblical Narrative
LTHE (LTGN) 158. Topics in Biblical Poetry
Soc./C 148E. Ethnicity and Politics
Soc./D 182. Revolutions
Soc./D 189. Special Topics in Comparative-Historical Sociology (Middle East Topics)

Molecular Pathology

OFFICE: 1012 Basic Science Building, School of Medicine

Professors

Stephen Baird, M.D., *Pathology*
Roland C. Blantz, M.D., *Medicine*
Colin M. Bloor, M.D., *Pathology, Director*
Pojen Chen, Ph.D., *Medicine and Pathology*
Kenneth R. Chien, M.D., *Medicine*
Daniel James Donoghue, Ph.D., *Chemistry and Biochemistry*
Russell F. Doolittle, Ph.D., *Chemistry (Emeritus)*
Richard Dutton, Ph.D., *Biology*
Marilyn G. Farquhar, M.D., *Pathology*

James Feramisco, Ph.D., *Medicine*
Joshua Fierer, M.D., *Medicine and Pathology (In-Residence)*
Martin Haas, Ph.D., *Biology (Adjunct)*
Alan F. Hofmann, M.D., Ph.D., *Medicine (Emeritus)*
Martin F. Kagnoff, M.D., *Medicine*
Michael Karin, Ph.D., *Pharmacology*
Thomas J. Kipps, M.D., Ph.D., *Medicine*
Thomas A. Lane, M.D., *Pathology*
Katsumi Miyai, M.D., Ph.D., *Pathology (Academic Senate Distinguished Teaching Award)*
Michael N. Oxman, M.D., *Medicine and Pathology*
Henry C. Powell, M.D., *Pathology*
Ann Rearden, M.D., *Pathology*
Douglas Richman, M.D., *Pathology and Medicine (In-Residence)*
Michael G. Rosenfeld, Ph.D., *Medicine*
Tsunao Saitoh, M.D., *Neurosciences*
Deborah H. Spector, Ph.D., *Biology*
Ajit P. Varki, M.D., *Medicine*
Gernot Walter, Ph.D., *Pathology*

Associate Professors

Laurence L. Brunton, Ph.D., *Pharmacology*
Theo N. Kirkland, M.D., *Pathology and Medicine*
Michael J. Kelner, M.D., *Pathology*
Bartholomew M. Sefton, Ph.D., *Salk Institute (Adjunct)*

Assistant Professors

Elizabeth Broome, M.D., *Pathology*
Mark Kamps, Ph.D., *Pathology*

Assistant Adjunct Professors

Robert Bookstein, M.D., *Canji, Inc.*
Susan M. Carroll, Ph.D., *Pathology*

Associate Adjunct Professor

Jane Burns, Ph.D., *Pediatrics*
Mike Kalichman, Ph.D., *Pathology*

Adjunct Professors

Floyd Bloom, M.D., *Neurosciences*
Lynette B. Corbeil, D.V.M., Ph.D., *Pathology*
Minoru Fukuda, Ph.D., *Pathology*
Frances D. Gillin, Ph.D., *Pathology*
Werner Heuschele, M.D., *Pathology*
Erkki Ruoslahti, M.D., *Pathology*
Bartholomew Sefton, Ph.D., *Pathology*

The goal of the molecular pathology Ph.D. program is to provide research training in the pathobiology of disease for physicians, health scientists, and biologists. 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 course requirements are designed to ensure that all students acquire competence in cellular and molecular pathology. The requirements are flexible in order to allow students from various backgrounds to join the program. Students holding a bachelor's degree in one of the biological sciences are required to take the introductory course in pathology taught for medical students. This requirement may be waived for students holding medical graduate degrees (M.D. or D.V.M.). All students must take five of seven core courses offered by faculty members from the Department of Pathology. These courses cover topics in molecular pathology, cancer, infectious disease, human genetic disease, nervous system disease, and developmental disorders.

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 has to be taken by the end of the third 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

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.

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.

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.

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.

299. Independent Study or Research (1-12)
Independent study or research.

NS 225. 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 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 prerequi-site 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 rel-

evance of these methods for investigating human disease will be discussed.

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 Muir College Writing Program is a sequence of courses in critical thinking and the writing of expository prose. During these courses, 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 entering fall quarter 1985 and after are required to take both MCWP 40 and MCWP 50 for a letter grade in their first year of residence at the college. Beginning fall quarter 1987 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. Completion of the sequence allows students to meet the Muir College writing requirement.

Certain exceptionally well-prepared students, particularly transfer students, may satisfy MCWP 40 or MCWP 50 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.

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: 110 Mandeville Center for the Arts

Professors

Brian Ferneyhough, Dip. Mus.
Edwin Harkins, Ph.D.
Aleck Karis, M.M.
George Lewis, B.A.
Cecil Lytle, B.A.
F. Richard Moore, Ph.D., *Chair*
János Négyesy, Dip. Mus.
Jann Pasler, Ph.D.
Carol Plantamura, M.F.A.
Roger Reynolds, M.M.
Steven Schick, M.M.
Harvey Sollberger, M.A.
Rand Steiger, M.F.A.
Bertram Turetzky, M.A.
Chinary Ung, Ph.D.

Associate Professors

Gerald Balzano, Ph.D.
John Fonville, D.M.A.
Philip Larson, M.M.

Assistant Professors

Marnie Dilling, Ph.D.
Miller Puckette, Ph.D.
Jane Stevens, Ph.D.

Music Technology Director

Peter Otto, M.F.A.

Emeritus Professors

James Cheatham, Dip. Mus.
Robert Erickson, M.A.
Peter Farrell, M.M.
Thomas Nee, M.A.
Wilbur Ogdon, Ph.D.
John Silber, Ph.D.
Joji Yuasa

Affiliate Faculty

Kenneth Anderson
Susan Barrett, M.A.
Garrett Bowles, Ph.D., *Music Librarian*
Heather Buchman, B.M.
David Chase, D.M.A.
Warren Gref
Paivikki Nykter, Dip. Mus.
Anne Seshadri, M.A.
Noriko Tsuboi, Tchg. Cert.
Stefani Walens, M.M.
Robert Zelickman, M.F.A.

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

Music Library

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, materials in non-Western music are being very aggressively expanded. The Music Library has a remote playback facility with the principal purpose of supporting 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. An auxiliary studio and seminar room are equipped with full remote control of any of the audio or video equipment. The Music Library has a homepage on the World Wide Web—[http://orpheus.ucsd.edu/music/index.html].

Center for Research in Computing and the Arts (CRCA)

The Center for Research in Computing and the Arts (CRCA) is an organized research unit of the University of California, San Diego. 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. Visit the CRCA homepage on the World Wide Web for more information [http://www-crca.ucsd.edu].

Music Technology Facilities

The Department of Music maintains a highly-sophisticated, newly-refurbished facility for the support of graduate and undergraduate instruction. These facilities consist of the following:

Computer Music Instructional Laboratory (CMIL)—Mandeville Center, Room B104. CMIL is a facility which supports eight networked Silicon Graphics and NeXT workstations, presentation technology, experimental music software, and an extensive complement of digital and analog audio equipment.

Recording and MIDI Project Studio—Mandeville Center, Room B108. This Macintosh-based studio supports MIDI for synthesis, processing, and control in music composition and performance. A digital audio workstation, digital multitrack, and isolation booth are included in a production package for precise digital recording and editing.

Macintosh Laboratory—Mandeville Center, Room B206. This facility supports many facets of the Music Department with fourteen Macintosh computer workstations, each with a MIDI interface and synthesizer. Music Theory, Acoustics, Electronic Music, Music Notation, and Library/Bibliography are among the curriculum areas supported.

Warren Studios

The Warren Studios are state-of-the-art musical recording and faculty research facilities. The studios were designed to meet 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;
- to support faculty research in psychoacoustics, computer music, and signal for audio; 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. For more information visit [http://www-crca.ucsd.edu/musictech/fac-studios.html] on the World Wide Web.

Concert and Recording Technology

Students can check out recording and concert production tools 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 of new works.

Undergraduate Studies

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 with little background in the study of music can choose from two sets of introductory courses: Music 1A-B-C develop basic skills musicians use in the analysis and performance of music; Music 4–14 introduce students to the music heritage of traditional and contemporary cultures. For students with prior musical background who wish to continue in upper-division theory courses, Music 2A-B-C is essential.

Major Programs

Two undergraduate major programs in music leading to the B.A. degree are offered at UCSD. The *Music Major Program* 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.

The Department of Music is committed to creative music making; thus all music majors are required to enroll in Music 95, Music 130, or Music 131 ensemble performance for at least six quarters, with three quarters of participation in a choral ensemble chosen from Music 95C, 95D, or 95K.

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, without requiring extensive training in theory or musicianship skills, 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. To continue within the major, all prospective students must pass a proficiency exam given at the end of the Music 2 series. All required music major courses must be taken for a letter grade, with the exception of Music 143, which should be 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:

1. Music 101A-B-C.
2. Music 102A-B-C.
3. Music 120A-B-C.
4. Two quarters of Music 133 (normally taken in the winter quarters of the junior and senior years).
5. Music 111 or Music 114.
6. One of the following sequences: Music 103A-B-C (composition), three courses (in addition to Music 111 or 114) from the series Music 111-127 (literature), Music 160A-B-C (music science and technology), or three quarters of Music 132 (performance).
7. Six quarters of Music 95, 130, or 131 (three from 95C, 95D, or 95K).
8. 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 111–127.
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. Six quarters of Music 95, 130, or 131.
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.

Honors

Outstanding students may seek a B.A. degree with honors in music or music/humanities. In addition to the requirements for the major, an honors degree requires twelve additional units, typically of Music 203D for composition, Music 111–127 (and/or Music 199) for the literature emphasis or the music/humanities major, Music 163 (and/or Music 199) for music science and technology, and Music 132R for performance. To be admitted into the Honors Program, students must obtain a faculty sponsor and complete an application within the first three weeks of fall quarter. This application will be reviewed by a faculty honors committee. Once the student has been accepted into the honors program, they will be considered a candidate for honors. At the end of spring quarter, the faculty honors committee will review the student's overall academic progress and determine if honors will be granted. Students interested in the Undergraduate Honors Program in Music 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 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 a departmental faculty adviser prior to embarking upon a minor program.

Advising Office

Undergraduate Staff Adviser
Stephanie Ferneyhough, Room 124
Mandeville Center, (619) 534-8226
sferneyhough@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* and *Critical Studies/Experimental Practices*. The doctoral of musical arts has an emphasis in *Contemporary Music Performance*.

Composition

The Composition Program is committed to encouraging the individual gifts and capacities of student composers in a diverse and active environment. This is done in a variety of ways, but primarily through intensive personal interaction between faculty and student.

An incoming member of 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 fall and again after the spring quarter, the entire composition community gathers for what is typically a day-long "jury." Each seminar member is allotted a block of time during which the composition that he or she has just completed is performed and recorded in a carefully rehearsed presentation. There is a detailed discussion of each work by the faculty present, and the student has opportunity to comment, explain, and question. Following the performance and discussions of this day, the composition faculty meets to assess the students' work. These events constitute the uniqueness of the

UCSD program, and manifest the range, seriousness, and vitality with which compositional issues are explored here.

After completing three quarters of seminar and two juries, students have come to know something about the ideas and attitudes of each faculty composer; the faculty is, in turn, aware of each student's aims and needs. At this point, then, an individual mentor is agreed upon and this relationship becomes the center of the student's continuing work as he or she completes the degree. There is also a biweekly Composition Forum at which faculty, students and selected visitors present work of interest (compositional, analytical, technological, even, perhaps, whimsical).

The seminars and forums are to foster mutual awareness on the part of the student composer group. Collegial relationships can develop which lead to creative outlets in cooperative projects. (These include the student-run Composers' Forums, performance collectives, recital projects, and so on.) 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

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, and
synchronization and control in live computer music performance.

Computers today are ubiquitous in all aspects of music theory and music-making. 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.

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 seminar topics include experimental and world-music systems of tuning and rhythm, film and popular music, psychoacoustics, representations of sexuality and gender in music, the analysis of complex music from both the nineteenth and the twentieth centuries, and contemporary theories of narrativity in music.

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 Graduate 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

Normally students will be admitted to begin graduate studies in the fall quarter only.

Step 1. Student must request and submit a preliminary departmental application along with a statement of purpose and unofficial/official transcript. The preliminary application is designed to evaluate student potential and area of interest. Depending on the outcome of faculty review, the applicant may or may not receive a formal university application.

Step 2. Formal university applications should be submitted by January 15th of the admission year; failure to meet that deadline will jeopardize the applicant's opportunity for admission and financial support.

Step 3. Applicants to graduate studies in music must submit, as part of the portfolio of supporting documents, the following:

a. Statement of purpose.

b. Three letters of recommendation.

c. Official transcripts.

d. Graduate Record Examination scores which includes the General Test and the Subject Test in Music.

e. Foreign applicants must submit TOEFL scores and a Foreign Applicant Financial Statement.

f. A repertory list of works (solo and chamber) performed during the past few years and a sample of printed concert programs in which they have participated, either as performer or composer.

g. A minimum of two papers illustrating writing ability in any of the following areas: analysis, criticism, aesthetics, music theory, or music technology.

h. For *Composition* applicants, 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.)

i. For *CS/EP* and *Computer Music*, prospective students should submit appropriate documentation (i.e., papers, performances, computer programs, etc.) of their prior work.

j. For *Performance* applicants, tapes and/or personal audition demonstrating their level of vocal and/or instrumental performance.

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), Music 210 (Musical Analysis), Music 228 (Conducting), 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 or C)—must take at least two times.
2. Music 203ABC (M.A. level)—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 or 207—a combination of two courses from Music 206/207.

COMPUTER MUSIC

1. Music 201 (A, B or C)—must take at least two times.
2. Music 203ABC or Music 232 (3 times)—must take within the first year of the program.
3. Music 206 or 207—required at least one time.
4. Music 263—must take at least four times.

CRITICAL STUDIES/EXPERIMENTAL PRACTICES

1. Music 201 (A, B or C)—must take at least two times.
2. Music 206—required at least one time.
3. Music 207—required at least two times.
4. CS/EP Sequence*—must take within the first year of the program.

*Pending approval.

PERFORMANCE

1. Music 201A—every quarter until graduation.
2. Music 206 or 207—a combination of at least two courses.
3. Music 232—every quarter until graduation.

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 lecture-recital lasting at least an hour. 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* 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 unless the student has completed this requirement in UCSD's master's degree program.
4. After completion of qualifying examination, all students must remain in residency for at least three quarters. During which time, they must enroll in twelve units of Music 299 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, or C)—must take at least two times.
2. Music 203ABC (Ph.D. level)—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 in residence.
4. Music 204—every quarter in residence.
5. Music 206 or 207—a combination of three courses from Music 206/207.
6. Music 209—must be taken at least three times.
7. Music 298—must complete at least six units.

CRITICAL STUDIES/EXPERIMENTAL PRACTICES

1. Music 201 (A, B or C)—must take at least two times.
2. Music 206 or 207—a combination of three courses from Music 206/207. Ph.D. students in the CS/EP program emphasizing computer music may replace one 206/207 requirement with three 263 seminars or two 206/207 requirements with four 263 courses.
3. Music 209—must be taken at least three times.
4. CS/EP Seminar*—must take within the first year of the program.
5. Music 263—these seminars may be substituted for the CS/EP Seminar by those Ph.D. students emphasizing computer music within the CS/EP Program.
6. Music 298—must complete at least six units.

*Pending approval.

PERFORMANCE

All D.M.A. students must complete or prove proficiency in the prerequisite courses of Music 160A and Music 231.

1. Music 201A—every quarter until completion of qualifying examination.
2. Music 206/207/209—as approved by D.M.A. adviser, students must take at least 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 250—must be taken at least three times.

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.

The qualifying examination will consist of the following:

1. A written and oral defense of three questions provided by the Doctoral Committee pertaining to appropriate areas of specialization.
2. For the D.M.A. students, in addition to the written and oral defense, students must provide 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 presentation of a substantial portion of the works to be performed on the student's "major recitals" will be performed as part of the qualifying examination.

Ph.D./D.M.A. Degree Completion Requirements

1. For *Composition* students, completion of a major composition project.

2. For *CS/EP* students, completion of an acceptable dissertation.
3. For *D.M.A.* students, two major recitals 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.
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 entering 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.).

Educational fee grants are provided to students within normative time after advancement to Ph.D./D.M.A. candidacy and until accrued time in graduate status exceeds the normative time.

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 entering 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 entering 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
Kim L. Kelso, Room 109
Mandeville Center, (619) 534-3279
kkelso@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. Musical Literacy (4-4-4)
Primarily intended for students whose major is other than music, 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. For music majors, to be taken concurrently with Music 2A-B-C.*

4. Introduction to Music (4)
The development of musical perception through the direct experience of listening. Topics include sound, texture, rhythm, melody, harmony, structural functions, means of organization, and form. Listening will include examples of Western music from the Middle Ages to the present, jazz, folk music, and the music of other cultural traditions. *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. History of Electronic Music (4)
This course will feature 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)
An exploration of the interactions among music, science, and technology, including the development and history of science and technology from the perspective of music, and the modern resynthesis of these disciplines, occurring around computers. *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)
Opera masterworks will consist of lectures, listening labs, and films. An in-depth discussion of five operas written between 1642–1925 by Monteverdi, Mozart, Verdi, Bizet, and Berg is included. *Prerequisite: none.* (Offered in selected years.)

13AF. World Music/Africa (4)
A course that focuses on the particular music of Africa and on African ways of music-making in the Diaspora to the Caribbean, North and South America. No prior technical knowledge of music is necessary. *Prerequisite: none.*

13AM. World Music/Ethnic Americans (4)
A study of music cultures in the United States, particularly Native American, Hispanic American, Anglo and European American, 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 (4)
Exposure to selected musical 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 in instrumental or vocal technique and repertory. Intermediate level. For declared music majors: students must be enrolled in courses in the music major curriculum. Students must audition for performance faculty on first Monday of fall quarter. *Prerequisites: department stamp required. Enrollment by consent of instructor after audition.* May be taken for credit six times.

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)

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. Music majors should enroll in at least one section each quarter. 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. Students may continue to take Music 95 series courses, however they must enroll with a P/NP grade option only.

Section A. Symphony Orchestra
Section B. Instrument Choir
Section C. Concert Choir
Section D. Symphonic Chorus
Section E. Chamber Orchestra (Not offered very year.)
Section F. Collegium Musicum (Not offered every year.)
Section G. Gospel Choir
Section H. Chamber Opera (Not offered every year.)
Section I. Music Theater (Not offered every year.)
Section J. Jazz Ensemble
Section K. Chamber Singers
Section L. Wind Ensemble
Section M. Madrigal Singers (Not offered every year.)
Section N. Non-Western Music

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 critically reviewed in seminar with fellow student and faculty composers. *Prerequisites: Music 2A-B-C.*

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. World Music Traditions (4)
A study of particular regional musics in their repertory, cultural context, and interaction with other traditions. Topics vary. *Prerequisite: upper-division standing or consent of instructor.*

112. European Music Before 1600 (4)
This course will focus on music of the Middle Ages and Renaissance; topics will very from year to year. May be repeated three times for credit. *Prerequisites: knowledge of music notation or consent of instructor; Music 4, 8-10 or 120 recommended.*

113. Music of the Baroque, Classic, and Romantic Periods (4)
This course will treat topics in Western music history between 1600 and 1900; topics will vary from year to year. May be repeated three 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: consent of instructor; Music 5 recommended.*

115. Women in Music (4)
An historical survey of women musicians from the Middle Ages to today. The course will deal with an historical view of women's place as creative and representative artists, the societal and political influences that governed their existence and their music. *Prerequisite: consent of instructor. (Offered in selected years.)*

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.*

121. Experimental Writing (4)
This workshop explores writing for which the traditional generic distinctions of pre/poetry, fiction/documentary, narrative/discourse do not apply. How music, prose, and poetry relate. Students taking this course will be asked to challenge the boundaries of these relations to discover new forms and modes of expression. *Prerequisite: consent of instructor.*

126. Introduction to Oral Music (4)
An introductory course in the study of oral music in Western and non-Western cultures, with particular emphasis on the impact of oral transmission of ideas and customs, and the nature of improvisation in various indigenous cultures. Music to be studied includes Afro-American, African, Asian, and Oceanian. Presentations by distinguished visiting artists demonstrating aspects of their native musical crafts. *Prerequisite: consent of instructor.*

127A-B. Music of African Americans (4-4)
The first quarter of this course will investigate the vocal music of African American culture, primarily the development of the spiritual and the blues traditions, while the second quarter will critically study the history of jazz in America. *Prerequisite: consent of instructor.*

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. Jazz Improvisation (4/0)
An extensive study of jazz improvisation, including performance techniques, concepts, and styles. Students' theoretical knowledge will be applied to their instruments, and a repertory of melodic and harmonic devices will be mastered. Also covered will be jazz soloing, demands of melodic/harmonic innovations, and modes of chord changes or progressions. May be taken for credit six times, after which students must enroll for zero units. *Prerequisites: basic knowledge of major-minor scales and major, minor, and dominant seventh chords on respective instruments. Basic functional keyboard techniques.*

132. Pro-Seminar in Music Performance (4)
Individual or master class instruction in advanced instrumental/vocal performance. May be repeated for credit, but only twenty-four units will be counted within the 180-unit requirement for graduation. *Prerequisite: consent of instructor through audition. Preference given to music majors and some approved music minors.*

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.*

133. Projects in New Music Performance (2)
Performance of new music of the twentieth century. Normally offered winter quarter only. Required a minimum of two times

for all music majors and music humanities majors. May be taken four times for credit. *Prerequisite: consent of instructor through audition.* (Winter quarter only.)

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 graduate and undergraduate music majors every quarter.

150. Senior Seminar (4)
Independent research with faculty guidance to afford the opportunity to pursue a creative project or substantial paper in a seminar context. *Prerequisites: Music 120B and declared music major or music humanities major.*

160A. Musical Acoustics and Recording (4)
An introduction to the acoustics of music and to modern techniques of recording sound. *Prerequisites: Music 1A-B-C or 2A-B-C and consent of instructor. Department stamp required.*

160B. Musical Psychoacoustics (4)
Survey of psychoacoustical phenomena, theories of hearing, and their relation to musical perception and cognition. Techniques of psychoacoustical experimentation. *Prerequisite: consent of instructor. Music 160A recommended. Department stamp required.*

160C. Electronics in Music (4)
Seminars in theoretical and applied research in the generation and processing of electronic sound for composition and performance. *Prerequisites: Music 160A and consent of instructor. Department stamp required.*

161. Programming for Musical Applications (4)
A first hands-on course in computer programming designed around the application of computers to the processing of musical sound and structures. *Prerequisites: Music 160A-B-C and consent of instructor. Department stamp required.*

162. Introduction to Computer Music (4)
Hands-on introduction to building instruments and creating music with computers. *Prerequisites: Music 161 and consent of instructor. Department stamp required.*

163. Music Technology Seminar (4)
Selected 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 162 and consent of instructor. Department stamp required.*

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.*

196. 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.

GRADUATE

All courses numbered 200 and above are intended for students admitted to the graduate program in music.

201A-B-C. Projects in New Music Performance (1 -4, 1-4, 1-4)
Performance of new music of the twentieth century. All performance emphasis graduate students must take every quarter. (Please note that Lab. 1 is intended for students participating in the Twentieth-Century Ensemble.) Non-performance students must take 201B or C twice.

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 (4-4-4)
Seminar consisting of 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.*

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.

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.

211. Seminar in World Music Traditions (4)
Study of the theory, repertory, and cultural features of particular tradition musics. Related to lectures of Music 111. Designed for graduate students in music as a forum for independent projects in research, analysis, performance, composition, and experimental derivatives related to the topic. Open to qualified graduate students in related fields.

212. Seminar in Vocal and Choral Literature (4)
A critical and historical study of selected works and repertory. (Offered in selected years.)

213. Opera Studies (4)
A detailed analytical study of selected operas in production in San Diego, Los Angeles, or San Francisco. *Prerequisite: consent of instructor.* (Offered in selected years.)

214. Seminar in Twentieth-Century Music (4)
Detailed study of selected literature through the study of scores and writings, supplemented when possible by performance participation. (Offered in selected years.)

215. Seminar on Women in Music (4)
Seminar dealing with a historical survey of women musicians from the Middle Ages to the present. A view of women's place as creative and representative artists, societal, and political influences that governed their existence and their music, and their impact upon their society and ours will be dealt with in-depth. *Prerequisite: consent of instructor.* (Offered in selected years.)

216. Medieval Music (4)
Readings, studies, and performance problems of medieval music from antiquity to the beginning of the Renaissance. Problems of tuning, language, source materials, and media esthetics are incorporated.

217. Seminar Studies in Late Renaissance and Early Baroque Music (4)
The study of early music as it has to do with theoretical systems, critical analyses, music and documentary source materials.

218. Seminar in Music of the Classic Era (4)
A critical, analytical study of selected literature of the eighteenth century through the study of scores and writings, supplemented when possible by performance participation.

219. Seminar in Music of the Nineteenth Century (4)
A critical, analytical study of selected literature of the nineteenth century through the study of scores and writings, supplemented when possible by performance participation.

220. Seminar in Bach and Related Studies (4)
A study of content and structure in selected compositions of J.S. Bach. *Prerequisite: consent of instructor.* (Offered in selected years.)

222. Music Drama (4)
In-depth analysis of the music and lyrics of important figures from the history of music theatre. Topics will vary each quarter but may include aspects of interpretation, production, direction, and design, and will be integrated with musical analysis. (Offered in selected years.)

223. Seminar Studies in Orchestral Literature (3)
Problems of performance and interpretation in representative works of orchestral music, including works for chamber orchestra, opera scenes, and choral works. Students will be responsible for problems of editing, bowings, and conducting. (Offered in selected years.)

224. Seminar Studies in Chamber Literature (4)
A critical and historical study of selected works and repertory. (Offered in selected years.)

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.*

236. Chamber Orchestra (4)
Study and performance of standard orchestra literature in coached rehearsal sessions. A high standard of performance must be demonstrated. This course may be repeated for credit any number of times. The literature performed varies from year to year and quarter to quarter. *Prerequisite: consent of instructor through audition.* (Offered in selected years.)

237. Opera Studio (4)
Study and performance of scenes from standard, classic operas, experimental music theatre, and chamber operas. *Prerequisite: consent of instructor through audition. Department stamp required.* (Offered in selected years.)

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.

263. Advanced Music Technology Seminar (4-4-4)
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 162 or equivalent and consent of instructor.*

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.)

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).

Neurosciences

OFFICE: Guava Building, School of Medicine, Mail code 0662

Professors

Ursula Bellugi, Ed.D., *Adjunct/Psychology*
Darwin K. Berg, Ph.D., *Biology*
Reginald G. Bickford, M.D., *Emeritus/Neurosciences*
Floyd E. Bloom, M.D., *Adjunct/Neurosciences and Psychiatry*
Reginald G. Bickford, M.D., *Emeritus/Neurosciences*
Theodore H. Bullock, Ph.D., *Emeritus/Neurosciences*
Eric Courchesne, Ph.D., *Neurosciences*
J. Anthony Deutsch, Ph.D., *Psychology*
Mark H. Ellisman, Ph.D., *Neurosciences*
Eva Engvall, Ph.D., *Adjunct/Neurosciences*
John W. Evans, Ph.D., *Mathematics*
Edmund J. Fantino, Ph.D., *Psychology*
Fred H. Gage, Ph.D., *Neurosciences*
Robert Galambos, M.D./Ph.D., *Emeritus/Neurosciences*
Mark A. Geyer, Ph.D., *Psychiatry*
J. Christian Gillin, M.D., *Psychiatry*
Philip M. Groves, Ph.D., *Psychiatry*
Stephen F. Heinemann, Ph.D., *Adjunct/Neurosciences*
Joan Heller-Brown, Ph.D., *Pharmacology*
Steven A. Hillyard, Ph.D., *Neurosciences*
Paul A. Insel, M.D., *Pharmacology*
Dilip J. Jeste, M.D., *In-Residence/Psychiatry/Neurosciences*
Harvey J. Karten, M.D., *Neurosciences and Psychiatry*
Robert Katzman, M.D., *Neurosciences*
Daniel F. Kripke, M.D., *In-Residence/Psychiatry*
William B. Kristan, Ph.D., *Biology*
Ronald Kuczenski, Ph.D., *Psychiatry*
Marta Kutas, Ph.D., *Cognitive Science/Adjunct/Neurosciences*
Robert B. Livingston, M.D., *Emeritus/Neurosciences*
Arnold J. Mandell, M.D., *Psychiatry/Emeritus*
Pamela Mellon, Ph.D., *Neurosciences*
Arnold L. Miller, Ph.D., *Graduate Adviser/Neurosciences*
Maurice S. Montal, M.D./Ph.D., *Biology and Physics*
R. Glenn Northcutt, Ph.D., *Neurosciences*
John S. O'Brien, M.D., *Neurosciences*
Stuart Patton, Ph.D., *Adjunct/Neurosciences*
James W. Posakony, Ph.D., *Biology*
Henry C. Powell, M.D., *In-Residence/Psychiatry*
Morton Printz, Ph.D., *Pharmacology*
Vilayanur S. Ramachandran, M.D., *Pyschology*
Michael G. Rosenfeld, M.D., *Medicine*
David S. Segal, Ph.D., *Psychiatry*
Terrence J. Sejnowski, Ph.D., *Biology and Physics/Neurosciences*
Allen I. Selverston, Ph.D., *Biology*
Nicholas C. Spitzer, Ph.D., *Biology*
Charles E. Spooner, Ph.D., *Neurosciences/Emeritus*
Larry R. Squire, Ph.D., *In-Residence/Psychiatry/Neurosciences*
Charles Stevens, M.D./Ph.D. *Adjunct/Neurosciences*
Palmer W. Taylor, Ph.D., *Pharmacology*
Robert D. Terry, M.D., *Neurosciences and Pathology/Emeritus*
Leon J. Thal, M.D., *Neurosciences, Chair Dept. of Neurosciences*
John Thomas, Ph.D., *Adjunct/Neurosciences*
Doris A. Trauner, M.D., *Neurosciences and Pediatrics*
Robert D. Tschirgi, M.D./Ph.D., *Emeritus/Neurosciences*
Roger Tsien, Ph.D., *Pharmacology*
Hoi-Sang U, M.D., *Surgery*
Wylie Vale, Ph.D., *Adjunct/Medicine*
Ajit Varki, M.D., *Medicine*
Silvio S. Varon, M.D., Eng.D., *Biology*
W.C. Wiederholt, M.D., *Neurosciences*
Tony Yaksh, Ph.D., *Anesthesiology*
Samuel S.C. Yen, M.D., *Reproductive Medicine*
Justin Zivin, M.D./Ph.D, *Neurosciences*
Stuart Zola, Ph.D., *In-Residence/Psychiatry, Group Chair/Director of Psychiatric Neurosciences*
Charles Zuker, Ph.D., *Biology*

Associate Professors

Karen Britton, M.D./Ph.D., *Psychiatry*
Stephen L. Foote, Ph.D., *In-Residence/Psychiatry*
Donna Gruol, Ph.D., *Adjunct/Neurosciences*
Richard H. Haas, M.D., *Neurosciences and Pediatrics*
Vivian Hook, Ph.D., *Adjunct/Neurosciences*
Vicente J. Iragui-Madoz, M.D./Ph.D., *Clinical Neurosciences*
George F. Koob, Ph.D., *Adjunct/Psychology*
John Liu, Ph.D., *In-Residence/Ophthalmology*
E. Roger Marchand, Ph.D., *Adjunct/Emeritus/Neurosciences*
Eliezer Masliah, M.D., *Neuroscience/Pathology*
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David H. Rapaport, Ph.D., *Anatomy/Surgery*
Tsunao Saitoh, Ph.D., *Neurosciences*
Clifford Shults, M.D., *Neurosciences*
Matthew Weinger, M.D., *Anesthesiology*
Mark C. Whitehead, Ph.D., *Surgery*
Charles Zuker, Ph.D., *Biology*

Assistant Professors

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Jody Corey-Bloom, M.D./Ph.D., *Clinical Neurosciences*
Lisa Gold, Ph.D., *Adjunct/Neurosciences*
Richard L. Hauger, M.D., *Psychiatry*
Christine Holt, Ph.D., *Biology*
Christy Jackson, M.D., *Clinical Neurosciences*
John Kelsoe, M.D., *Psychiatry*
Christopher Kintner, Ph.D., *Adjunct/Neurosciences*
Greg Lemke, Ph.D., *Adjunct/Neurosciences*
Leah Levi, M.D., *In-Residence/Opthall/Neurosciences*
Mark Montminy, Ph.D., *Adjunct/Neurosciences*
John Olichney, M.D., *Adjunct/Neurosciences*
Jaime A. Pineda, Ph.D., *Cognitive Sciences*
Dennis D. Rasmussen, Ph.D., *Reproductive Medicine*
Veronica J. Roberts, Ph.D., *Reproductive Medicine*
Martin I. Sereno, Ph.D., *Cognitive Science*
Linda Sorkin, Ph.D., *In-Residence/Anesthesiology*
Neal Swerdlow, M.D./Ph.D., *In-Residence/Psychology*
Evelyn Tecoma, M.D./Ph.D., *Clinical Neurosciences*
Mark Tuszynski, M.D./Ph.D., *In-Residence/Neurosciences*
Eric Turner, M.D./Ph.D., *In-Residence/Psychiatry*
Matthew Weinger, M.D., *Anesthesiology*

[illegible] Program

The group in the neurosciences accepts for the Ph.D. degree candidates with undergraduate 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 interests and goals which also provide a solid grounding in the several disciplines of preclinical neurosciences. The selection will include formal courses listed in this catalog and informal seminars offered by the department. Close association among students, faculty, and postdoctoral personnel adds to this informal, tutorial type of instruction. 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. A period of study at one of the other campuses of the University of California can be arranged by mutual agreement.

Course Work

There are few formal course requirements for the Ph.D. degree. However, by the time of the minor proposition (see below), students are expected to demonstrate competence through written examination in five "core" courses of which two are mandatory: Neuroanatomy (Neurosci. 256/257), and Statistical Methods and Experimental Design (Neurosci. 225). Included among the remaining core courses, from which two must be chosen, are: Molecular and Cellular Neuroendocrinology (Neurosci. 222), Molecular and Cellular Neurochemistry (Neurosci. 234), Neuropsychopharmacology (Neurosci. 277), Neurophysiology (Neurosci. 262), Molecular and Cellular Neurobiology (Neurosci. 268), Behavior (Neurosci. 264), and Development (Neurosci. 263). The faculty offers core courses in all of these areas. Students are also permitted to substitute previous courses that are similar to the Neurosciences core courses. Such a substitution would require approval of the specific faculty member and graduate adviser.

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 out of 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. This exemption would only pertain to the creative written part of the exam. All students are required to take the second part of the exam which tests general neuroscience knowledge.

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. Facilities are available for research on marine forms, vertebrate and invertebrate.

Qualifying Examination

This examination, a university requirement, will normally focus on the proposed research that the student will undertake for his or her dissertation. Demonstration of competence in the five core areas declared earlier should have been exhibited previous to the qualifying examination, e.g., final examination scores from one or more of the core courses. The examination should be taken no later than the end of the spring quarter of the third year.

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 expected 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 be advanced to candidacy by the end of three 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

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. (S/U grades only.) (W)

225. Statistical Methods and Experimental Design (4)
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.*

233. Comparative Vertebrate Neurobiology (4)
Survey of the organization and evolution of vertebrate nervous systems. *Prerequisite: consent of instructor.* (S/U grades only.) (F)

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. (S/U grades only.) (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)

246. Advanced Neuroanatomy (2)
The purpose of this course is to present selected advanced topics in the anatomy of the nervous system. It will emphasize the organization of functional systems but consideration of neural ultrastructure and growth and development will be included. (S/U grades only.) (S)

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.)

252. Information Processing in Man (1)
Reports of ongoing research into human information, with emphasis on electrophysiological changes during attention to, and perception and comprehension of, visual, auditory, and somatic stimuli.

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)

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.) (F)

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)

262. Neurophysiology (4)
An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. *Prerequisites: graduate-student status in neurosciences, biology or physiology-pharmacology, or medical student, core course in neurophysiology and core course in neuroanatomy or equivalent.* (S/U grades permitted.) (W)

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/U grades only.)(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.* (S/U grades only.)(S)

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.* (S/U grades permitted.) (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. Neurophysiological, neuroanatomical, and psychological evidence will be explored. *Prerequisite: undergradu-*

ate or graduate course in neurobiology. (S/U grades permitted.) (W)

275. Advanced Topics in Neuroscience (2)
Specialized advanced topic areas in neroscience will be addressed in an interactive seminar course format. A different specific topic area will be considered each quarter as announced in advance. Students will present an aspect of the topic area and participate in discussions. *Prerequisite: graduate status or consent of instructor.* (S/U grades only.) (F,W,S)

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. (S/U grades only.) (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)

278. Clinical Neurosciences (4)
This course is intended to provide graduate students with an understanding of the clinical approach to neurological disease; the psychological, neuropsychological, and pathological aspects of major human neurological disorders; and the relation of clinical phenomenology observed in these disorders. *Prerequisite: Neurosci. 256/257.* (S/U grades permitted.) (W)

279. Molecular Glycobiology (2)
(Same as Biomed. Sci. 222, Chem. 237, Medicine 225) Molecular glycobiology encompasses studies of the structure, biosynthesis, and biological roles of oligosaccharide units on glycoconjugates. This course will provide an overview of this rapidly evolving field, with an emphasis on the glycoconjugates of eucaryotic organisms in the animal kingdom. (S)

296. Neurosciences Independent Research (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 Clerkshop (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)

425. Subinternship in Neurology (7)
The subinternship involves the primary care of hospitalized neurology patients under the direct supervision of a neurology resident and attending physician. Subinterns are expected to assume total primary care of their patients, to perform all procedures, and to participate in night call, daily neurology teaching rounds, and weekly Grand Rounds. *Prerequisite: Neurology 401 or consent of instructor.* (S/U grades only.)

426. Subintern Pediatric Neurology (7)
Subinterns are responsible for the primary care of hospitalized pediatric neurology patients under direct resident and attending physician supervision. They will perform procedures such as lumbar puncture and participate in night call, daily teaching rounds, neurology Grand Rounds, and Journal Clubs. *Prerequisite: Neurology 401 or consent of instructor.* (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 departmental 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 teaching assistant for one quarter. *Prerequisite: neurosciences graduate students.* (S/U grades only.) (F,W,S)

Philosophy

OFFICE: 7002 H&SS, Muir College
Web Site: http://www.ucsd.edu/philosophy

Professors

Henry E. Allison, Ph.D., *Research Professor*
Georgios H. Anagnostopoulos, Ph.D.
Richard J. Arneson, Ph.D., Chair
Patricia Smith Churchland, B.Phil.
Paul M. Churchland, Ph.D.
Gerald D. Doppelt, Ph.D.
Clark Glymour, Ph.D.
S. Nicholas Jolley, Ph.D.
Patricia W. Kitcher, Ph.D., *Chair*
Philip S. Kitcher, Ph.D.
Edward N. Lee, Ph.D., *Professor Emeritus*
Stanley W. Moore, Ph.D., *Professor Emeritus*
Frederick A. Olafson, Ph.D., *Professor Emeritus*
Avrum Stroll, Ph.D., *Research Professor*
Zeno Vendler, Ph.D., *Professor Emeritus*

Associate Professors

David O. Brink, Ph.D.
Michael O. Hardimon, Ph.D.
Sandra D. Mitchell, Ph.D.
Frederick W. Neuhouser, Ph.D.
Gila Sher, Ph.D.

Assistant Professors

Adrian Cussins, Ph.D.
Wayne M. Martin, Ph.D.
Steven Yalowitz, Ph.D.

Visiting Associate Professor

Mary Devereaux, Ph.D.

Philosophy is the study of conceptual problems that pertain to the nature of knowledge, reality, and human conduct. Among the chief areas of the subject are logic, metaphysics, theory of knowledge, ethics, political philosophy, and the philosophy of science. The academic study of philosophy at UCSD emphasizes a sound understanding of the history of the discipline and the development of analytical skills, and an undergraduate major in philosophy may be regarded as an excellent preparation for many careers in which such skills are emphasized.

The Department of Philosophy also offers a graduate program leading to the M.A. and Ph.D. degrees. It is the intention of the graduate program to enable the student to obtain an understanding of divergent philosophical 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, philosophy of language, philosophy of mind, philosophy of science, ethics, social philosophy, contemporary Anglo-American and European philosophy, etc.

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. 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.

Area 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 120 (formerly Philosophy 110) is required of all majors. Note that Philosophy 120 has as a prerequisite Philosophy 10 (or an equivalent course from another department or institution). Because Philosophy 120 is a prerequisite for a variety of upper-division courses, prospective majors are strongly encouraged to take it and Philosophy 10 (or its equivalent) 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.

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.

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 Students—Procedure to Verify Acceptability of Courses

Courses taken at another institution may be used in satisfaction of major requirements, with the approval of the department. This approval is obtained by completing a petition, obtainable from the department office, and returning it to the undergraduate adviser.

Undergraduate Program—Minor

The Department of Philosophy offers a minor in philosophy. A minor requires a total of six philosophy courses, at least three of which must be upper-division. All courses must be taken for a letter grade.

Advising Office

Students who desire additional information concerning our course offerings or program may contact individual faculty or the undergraduate adviser through the department office at 7030 H&SS, (619) 534-3077.

[redacted]

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 divergent philosophical 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.

[redacted]

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 ethic/social-political category, and no more than four from either of the other two areas may count toward the master's degree. The student must also complete a master's research paper following one four-unit directed study course with a faculty member of his or her choice.

[redacted]

Course Work

During the first two years of residence the student's course 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).

Before the beginning of each term, and especially before the fall term, students are required to have their course choices approved by an assigned adviser. Courses should be chosen with an eye toward meeting the program's distribution requirements, as outlined below.

Logic Requirement

During the first term of residence, all entering graduate students will taken 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 110 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 Philosophy 111 or 112 with at least a grade of B.

Distribution Requirements

By the end of the seventh quarter of residence, a student must have completed ten graduate seminars in philosophy. The seminars must be distributed across the following areas:

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. **Two seminars** chosen from the fields of ethics, social philosophy, political philosophy.
3. **Four seminars** chosen (in any combination) from the fields of metaphysics, epistemology, philosophy of mind, philosophy of science, philosophy of language, philosophy of mathematics, philosophy of logic.

Courses used to satisfy a requirement in one category cannot be used to satisfy a requirement in another category.

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.

Before the beginning of each quarter, and especially before the fall quarter, a student is required to have all course choices approved by a faculty adviser.

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

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 suitable demonstration of competence. The language requirement must be met before the student can be advanced to candidacy.

Third Year

In the third year of residence, the student must complete with a passing grade at least one regular graduate seminar in each quarter until the end of that year or admission to candidacy, whichever comes first.

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 the 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 examination 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 (619) 534-6809 or write to: University of California, San Diego; Graduate Adviser; Philosophy, 0119; 9500 Gilman Drive; La Jolla, CA 92093-0119.

E-mail address: casmann@ucsd.edu.

Joint Degree Programs

The philosophy department at UCSD participates in two interdisciplinary programs, the requirements for which are outlined below. For each program, students are expected to satisfy roughly two-thirds of the distribution requirements in the philosophy program. This means that instead of ten philosophy seminars at the end of the seventh quarter, students must have completed six (properly distributed), and that instead of eight philosophy seminars by the end of the fifth quarter, students in those programs must have completed five, with a cumulative average of B+ or better.

Joint Degree Program with the UCSD Cognitive Science Faculty

The UCSD cognitive science faculty is an interdisciplinary group of twenty-seven scholars drawn from the Departments of Psychology, Neuroscience, Biology, Computer Science and Engineering, Electrical and Computer Engineering, Linguistics, Philosophy, Sociology, Anthropology, and Psychiatry. This group includes

many of the outstanding figures in contemporary cognitive science.

Students wishing to pursue a Ph.D. in "Cognitive Science and Philosophy" register in the philosophy program in the normal fashion, but pursue a significant portion of their studies within an interdisciplinary group of departments affiliated with the Department of Cognitive Science. These departments include Anthropology, Computer Science and Engineering, Linguistics, Neurosciences, Psychology, and Sociology. Students may apply for admission to the interdisciplinary program at the same time 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 studies are required to take:

1. A total of nine seminars in philosophy, including four courses from either history or epistemology and metaphysics, and two courses from one of the other groups listed above under the subheading "Distribution Requirements." By the end of the fifth quarter of residence, a student must have taken at least five of these seminars (distributed across at least two areas), and must have achieved an average of 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 equivalent of one year's course work (usually six courses) in one or more of the other departments affiliated with the Department of Cognitive Science.
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 three disciplines for their major field of specialist studies, and are required to complete minor field requirements in the other two. The core of the program, however, is a year-long seminar in science studies, led by faculty from all three participating departments.

Students pursuing a "Philosophy and Science Studies" degree are required to take a total of eighteen courses. At least nine of these must be in philosophy, with the remainder drawn from history of science, sociology of science, or the sciences. The courses must satisfy distribution requirements: six seminars must be taken in philosophy by the end of the seventh quarter of residence, distributed across the three required areas listed above. No more than four and no fewer than two courses in any one area may be used to satisfy the requirements. Two courses must be taken in history of science; and two must be in sociology of science. All science studies students are required to take the science studies year-long core seminar. This seminar contributes toward the distribution requirements, counting as one seminar in history of science, one seminar in sociology of science, and one seminar in philosophy (the epistemology-metaphysics group). By the end of the fifth quarter of residence, a student must have taken at least five of these philosophy seminars (distributed across at least two areas), and must have achieved an average of 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.

Students may apply for admission to the interdisciplinary program at the same time 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.

COURSES

LOWER-DIVISION

1. The Nature of Philosophy (4)
What is philosophy? A study of major questions with which philosophers deal by means of classical and contemporary works, with an emphasis on the way philosophy grows out of familiar thoughts and ways of reasoning.

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. (Fulfills the Warren College formal skills requirement.)

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. (Fulfills the Warren College formal skills requirement. Also fulfills Marshall College formal skills requirement.)

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 in fulfilling the Marshall College humanities sequence.)

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 in fulfilling the Marshall College humanities sequence.)

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 in fulfilling the Marshall College humanities sequence.)

23-24-25. Individual and Society (4-4-4)
A course dealing with the historical and systematic development of social and political thought and institutions. Analysis and critical examination of representative texts drawn from classical and contemporary sources. (Philosophy 23-24-25 may be used to fulfill the Muir College breadth requirement and the Marshall College humanities sequence.)

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 and the Marshall College humanities sequence.)

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 and the Marshall College humanities sequence.)

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 and the Marshall College humanities sequence.)

90. Undergraduate Seminar (1)
Investigation of a selected philosophical topic through readings, discussions, and written assignments. Emphasis on student participation. *Prerequisite: consent of instructor.* Limited enrollment.

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. Formerly Philosophy 101.*

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. Formerly Philosophy 102.*

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.*

103. Medieval Philosophy (4)
A study of major trends in medieval philosophy through the works of philosophers such as Augustine, Aquinas, Scotus, and Ockham. *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.* May be repeated for credit with change of content and approval 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. Quine (4)
Central themes in Quine's philosophy, such as the nature of logical truth, ontological commitment and relativity, extensionality, the rejection of the analytic-synthetic distinction, holism, epistemology naturalized, and the indeterminacy of meaning and translation. *Prerequisite: Philosophy 120 or consent of instructor.*

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. Formerly Philosophy 110.*

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. Formerly Philosophy 111.*

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-Löwenheim 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 non-standard 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. Formerly Philosophy 115.*

124. Philosophy of Mathematics (4)
The character of logical and mathematical truth and knowledge; the relations between logic and mathematics; the significance of Gödel's incompleteness theorem; Platonism, logicism, and more recent approaches. 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. Formerly Philosophy 170.*

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.*

133. Topics in Epistemology (4)
An in-depth study of some central problem, figure, or tradition in epistemology. May be repeated with change of content and approval of instructor. *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. Formerly Philosophy 130.*

135. Meaning and Communication (4)
The possibility and nature of communication and its bearing on how signs get their meaning. Topics include the relationship between language and thought, problems with translation and interpretation, the role of environmental and social context, and speech act theory. *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. *Prerequisite: upper-division standing or consent of instructor.*

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 anti-realism. *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. Formerly Philosophy 181.*

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. Formerly Philosophy 182.*

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. Formerly Philosophy 174.*

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. Formerly Philosophy 187.*

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. Formerly Philosophy 183.*

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. Formerly Philosophy 184.*

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. Formerly Philosophy 164.*

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. Formerly Philosophy 123.*

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. Formerly Philosophy 125.*

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. Formerly Philosophy 124.*

163. Bio-Medical 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. Formerly Philosophy 122.*

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. Formerly Philosophy 186.*

165. Professional Ethics (4)
An inquiry into questions about what a profession is; the fundamental norms that ought regulate the professions, professionals, and the professional-client relationship; the relation between the duties of professionals and those of ordinary people; and special problems faced in specific professions (e.g. law, medicine, business, and engineering). *Prerequisite: upper-division standing or consent of instructor. Formerly Philosophy 127.*

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. Formerly Philosophy 162.*

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.*

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. Formerly Philosophy 150.*

176. Film Aesthetics (4)
An examination of the features that make film a distinctive art form and of philosophical issues that arise in relation to the medium. *Prerequisite: upper-division standing or consent of instructor. Formerly Philosophy 153.*

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. Formerly Philosophy 152.*

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.*

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.*

184. Religious Existentialism (4)
This course will deal with the existential approach to the religious life and with issues such as faith, freedom, and guilt. Authors studied will vary and may include Pascal, Kierkegaard, Dostoyevsky, Buber, and Tillich. *Prerequisite: upper-division standing or consent of instructor. Formerly Philosophy 161.*

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. Formerly Philosophy 160.*

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. Formerly Philosophy 185.*

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. *Prerequisite: consent of instructor. Formerly Philosophy 196A.*

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. Formerly Philosophy 196B.*

195. Introduction to Teaching Philosophy (4)
By special arrangement with and under the supervision of the instructor, each student will run a regular class section in one of the philosophy department's courses. *Prerequisites: consent of instructor and department chair.*

198. Directed Group Study (4)
Directed group study on a topic not included in the regular department curriculum by special arrangement with and under the supervision of a faculty member. (P/NP grades only.) *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

201. Greek Philosophy (4)
A Study of selected authors and texts from the history of ancient Greek philosophy. May be repeated for credit with change of content.

202. Hellenistic and Roman Philosophy (4)
Selected topics drawn from the major philosophical schools in the Hellenistic and Roman periods, among them Stoicism, Epicureanism, Skepticism, and Neo-Platonism.

203. Medieval Philosophy (4)
A study of representative writings from one or more of the major philosophical movements of the Middle Ages.

204. Early Modern Philosophy (4)
A study of selected philosophers of the sixteenth and seventeenth centuries; for example, Descartes, Spinoza, Leibniz, and Locke. May be repeated for credit with change of content.

205. Eighteenth-Century Philosophy (4)
A study of major philosophical texts for the period, such as Kant's Critique of Pure Reason and Hume's Treatiseof Human Nature. May be repeated for credit with change of content.

206. 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 repeated for credit with change of content.

207. Contemporary 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.

208. Contemporary Analytical Philosophy (4)
A study of the historical development of the analytical movement, with emphasis on major texts. May be repeated for credit with change of content.

209A-B-C. Seminar in Science Studies (4-4-4)
A three-quarter sequence of readings and discussions, taught each quarter by a member of one of the departments (history, sociology, philosophy) participating in the graduate science studies program. Required of all students in the program in their first year; those in later years are expected to audit this course, the content of which will change from year to year. IP grade to be awarded the first and second quarters; the final grade will not be given until the end of the third quarter.

210. Philosophy of Logic (4)
A study of major topics in logical theory: the status of logical truth, the epistemology and metaphysics of logic, the significance of recent results in mathematical and logical theory, the significance of alternative systems of logic. *Prerequisite: Philosophy 110 or equivalent.*

211. Advanced Symbolic Logic (4)
Topics in mathematical logic and set theory, metatheory, nonstandard logics, and other contemporary developments in logical theory. *Prerequisite: Philosophy 111 or equivalent.*

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.*

215. Introduction to Formal Semantics (4)
A general introduction to theories of sense and reference, comprising a comparative approach to Fregean, Russellian, and Tarskian semantic techniques, with emphasis on semantic primitives and the general structure of theories of truth.

223. Ethics (4)
An examination of the nature of moral problems, judgments, and principles, with emphasis on recent developments in moral philosophy and classic formulations of ethical theories.

224. Social and Political Philosophy (4)
An analysis of social philosophies and ideologies in their relationship to basic types of social structure. May be repeated for credit with change of content.

235. Philosophy of Language (4)
(Same as Linguistics 286.) Examination of some current philosophical and scientific views on the nature, use and acquisition of natural languages. May be repeated for credit as course content may vary.

250. 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.

260. Philosophy of Religion (4)
A study of the philosophical foundations of religious experience, including the nature of belief and knowledge, faith and reason, God, and the character and meaning of religious commitment.

262. History of Law in Philosophical Perspective (4)
Course will study the way in which the historical development of the Western legal system reflects issues raised in the literature of legal philosophy. Students will read works of legal philosophy in conjunction with studies of the history of legal doctrines and institutions.

264. Philosophy of History (4)
An examination of basic concepts, categories, and representative philosophies of history.

270. Contemporary Epistemology and Metaphysics (4)
A detailed examination of some fundamental issues in contemporary philosophy, especially those centering about the theories of meaning and reference.

272. Theory of Knowledge (4)
An examination and critique of representative theories of mind, reality, knowledge, and perception.

274. Philosophy of Mind (4)
Contemporary work on the relation of mind and body, subjectivity, and the problem of other minds. May be repeated for credit with change of content.

285. Seminar on Special Topics (4)
A seminar for examination of specific philosophical problems (S/U grades permitted.)

290. Direct Independent Study (4)
Supervised study of individually selected philosophical topics. May be repeated for credit. *Prerequisite: consent of instructor.* (S/U grades permitted.)

295. Research Topics (1-12)
Advanced, individual research studies under the direction of a member of the staff. May be repeated for credit. *Prerequisite: consent of graduate adviser.* (S/U grades permitted.)

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 the Humanities Program in Revelle College, or in the writings programs offered by the various colleges. Each Ph.D. candidate must teach the equivalent of quarter time for three academic quarters. (S/U grades only.)

Physical Education

Because of university budget reductions, the Department of Physical Education has been discontinued. Physical activity classes are available through Campus Recreation. For information call (619) 534-4037.

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

Professors

Henry D. I. Abarbanel, Ph.D., *Director, Institute for Nonlinear Science*
Ami E. Berkowitz, Ph.D., *Research Professor*
James G. Branson, Ph.D.
Keith A. Brueckner, Ph.D., *Emeritus*
E. Margaret Burbidge, Ph.D., *Emeritus*
Geoffrey R. Burbidge, Ph.D.
Joseph C. Y. Chen, Ph.D.
Patrick H. Diamond, Ph.D.
Robert C. Dynes, Ph.D., *Chancellor*
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., *Dean, Division of Natural Sciences*
John M. Goodkind, Ph.D.
Robert J. Gould, Ph.D., *Research Professor*
Benjamin Grinstein, Ph.D.
Jorge E. Hirsch, Ph.D.
Barbara Jones, Ph.D.
Norman M. Kroll, Ph.D., *Research Professor*
Julius Kuti, Ph.D.
Herbert Levine, Ph.D.
Leonard N. Liebermann, Ph.D., *Emeritus*
Ralph H. Lovberg, Ph.D., *Emeritus*
Aneesh 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., *Research Professor*
Carl E. McIlwain, Ph.D., *Research Professor*
Melvin Y. Okamura, Ph.D.
Jose N. Onuchic, Ph.D.
Thomas M. O'Neil, Ph.D.
Hans P. Paar, Ph.D., *Vice Chair, Education*
Laurence E. Peterson, Ph.D., *Director, Center for Astrophysics and Space Sciences, Research Professor*
Oreste Piccioni, Ph.D., *Emeritus*
Sally K. Ride, Ph.D.
Marshall N. Rosenbluth, Ph.D., *Research Professor*
Ivan K. Schuller, Ph.D.
Sheldon Schultz, Ph.D., *Director, Center of Magnetic Recording Research, Research Professor*
Lu Jeu Sham, Ph.D., *Chair*
Vitali Shapiro, Ph.D.
Harding E. Smith, Ph.D.
Harry Suhl, Ph.D., *Research Professor*
Clifford M. Surko, Ph.D.
Robert A. Swanson, Ph.D., *Research Professor*
Harold Ticho, Ph.D., *Emeritus*
David R. Tytler, Ph.D.
Wayne Vernon, Ph.D., *Emeritus*
Arthur M. Wolfe, Ph.D.
David Y. Wong, Ph.D.
Nguyen-Huu Xuong, Ph.D.
Herbert F. York, Ph.D., *Emeritus*

Associate Professors

Daniel P. Arovas, Ph.D.
Daniel H.E. Dubin, Ph.D.
Kim Griest, Ph.D.
Frances Hellman, Ph.D.
Terrence T-L. Hwa, Ph.D.
David Kleinfeld, Ph.D.
Oscar Lumpkin, Ph.D.

Assistant Professors

Elizabeth Jenkins, Ph.D.
Scot R. Renn, Ph.D.
Vivek A. Sharma, Ph.D.

Adjunct Professors

Alan M. Eisner, Ph.D.
John M. Greene, Ph.D.
Hans Kobrak, Ph.D., *Emeritus*
Tihiro Ohkawa, Ph.D.
Philip M. Platzman, Ph.D.
Terrence J. Sejnowski, Ph.D.
Shmuel Shtrikman, Ph.D.
Wayne A. Stein, Ph.D.
Ronald E. Waltz, Ph.D.

Senior Lecturers

Charles F. Driscoll, Ph.D.
Roger Judge, Ph.D., *Emeritus*
Valentin Shevchenko, Ph.D.

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

In addition to on-campus research facilities, the high energy program uses accelerators at SLAC, CERN, Cornell, and Fermi Laboratory. The astrophysics program uses facilities at Keck, Lick, Mt. Lemmon, 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 biophysics

B.S., physics with specialization in biophysics-premedical

B.S., physics with specialization in earth sciences

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 upper-division program for physics majors is intended to provide basic education in several principal areas of physics, with some opportunity for study in neighboring areas in the form of restricted electives. Provision is made, both in the main courses and in the elective subjects, for some training in a few of the more technological aspects of physics.

In the junior year, the emphasis is on macroscopic physics; the two principal physics subjects are electromagnetism and mechanics. The mathematics 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. The quantum physics sequence aims at an integrated, descriptive, and analytical treatment of those areas of physics in which quantum effects are important, particularly atomic and nuclear physics and elementary particle physics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major:

Lower-Division

1. Physics 4A-B-C-D-E* and 2CL-DL.
2. Chemistry 6A
3. Mathematics 20C, 20D, 20E, 20F or 21C, 21D, 20E, 20F†

*If students transfer from another major or transfer from another college or university and have already completed the Physics 2 sequence or equivalent, they may petition to count Physics 2A-B-C-D plus Chemistry 6B or equivalent as a substitute for Physics 4A-B-C-D-E.

† Effective fall 1994, the Department of Mathematics replaced the Mathematics 2 sequence with a new Mathematics 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

Upper-Division

1. Physics 100A-B-C, 105 or 130C, 110A-B, 120A-B, 130A-B, 140A-B, and two additional laboratory courses from the following group: 121, 131, 132, 133. Students may petition to have one Physics 199 replace Physics 132 or 133.
2. Mathematics 110.
3. Restricted Electives: Three upper-division (four-unit) or graduate courses in natural sciences or mathematics (one only), subject to departmental approval. (Mathematics 120A is recommended).

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Physics 100A	Physics 100B	Physics 100C
Physics 105†	Physics 110B	Physics 120B
Physics 110A	Physics 120A	Physics 130A
Mathematics 110		
SENIOR YEAR		
Physics 130B	Physics 130C†	Restr. Elec.
Physics 140A	Physics 140B	Physics 132* or
Restr. Elec.	Physics 131*	133*
Physics 121*	Restr. Elec.	

*Students choose two out of these four senior lab courses.
†Students choose either Physics 105 or Physics 130C or may take both courses.

Physics Major with Specialization in Biophysics (B.S. Degree)

The upper-division program for physics majors with specialization in biophysics is essentially the same as the standard physics major with some modification to provide the education in biology and chemistry needed for advanced work in biophysics. Students entering the program with backgrounds deficient in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

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-CL.
3. BILD 1.
4. Mathematics 20C, 20D, 20E, 20F or 21C, 21D, 20E, 20F.†

† Effective fall 1994, the Department of Mathematics replaced the Mathematics 2 sequence with a new Mathematics 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, in-

cluding recommended entry points and retake substitutions. Please consult Department of Physics undergraduate advising office for specific changes to major requirements.

Upper-Division

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153.
2. Chemistry 127 or 131, 140A-B, 143A.
3. BIBC 100, BIBC 103, BIMM 100, BICD 110, BICD 100.*
4. Mathematics 110.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Physics 100A	Physics 100B	Physics 100C
Physics 105	Physics 120A	Physics 120B
Physics 110A	Chem. 140B	Physics 130A
Chem. 140A		Chem. 143A
SENIOR YEAR		
Physics 130B	BIBC 103	Physics 153
BIBC 100	Chem. 127#	BIMM 100
BICD 100		BICD 110
Chem. 131#		

*The Department of Biology renumbered all biology courses effective fall quarter 1993. See "Biology" for conversion of old course numbers to new course numbers.
#Students choose Chemistry 127 or Chemistry 131.

Physics Major with Specialization in Biophysics-Premedical (B.S. Degree)

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with backgrounds deficient in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics-premedical:

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-CL.
3. BILD 1.*
4. Mathematics 20C, 20D, 20E, 20F or 21C, 21D, 20E, 20F.†

† Effective fall 1994, the Department of Mathematics replaced the Mathematics 2 sequence with a new Mathematics 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

Upper-Division

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153.
2. Chemistry 127 or 131, 140A-B, 143A.
3. BIBC 100, BICD 110, BICD 100, BIMM 100.*
4. Mathematics 110.
5. Restricted Elective: one biology course (BICD 130, BICD 134, or BIMM 112).*

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Physics 100A	Physics 100B	Physics 100C
Physics 105	Physics 120A	Physics 120B
Physics 110A	Chem. 140B	Physics 130A
Chem. 140A	Mathematics 110	Chem. 143A
SENIOR YEAR		
BIBC 100	Chem. 127#	Physics 153
BICD 100	Restr. Elec.	BICD 110
Chem. 131#		BIMM 100

*The Department of Biology renumbered all biology courses effective fall quarter 1993. See "Biology" for conversion of old course numbers to new course numbers.
#Students choose Chemistry 127 or Chemistry 131

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, Physics 105, and Mathematics 110.

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, 20D, 20E, 20F or 21C, 21D, 20E, 20F.†

† Effective fall 1994, the Department of Mathematics replaced the Mathematics 2 sequence with a new Mathematics 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

Upper-Division

1. Physics 100A-B-C, 105, 110A-B, 120A-B, 130A, 140A-B.
2. Earth Sciences 101, 102, 103, 120.
3. Mathematics 110.
4. Restricted Electives: three upper-division (four-unit) or graduate courses to be chosen with the approval of the SIO earth sciences adviser.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Physics 110B	Physics 120B
Earth Sci. 101	Physics 120A	Physics 130A
Mathematics 110	Earth Sci. 102	Earth Sci. 103
SENIOR YEAR		
Physics 105	Physics 140B	Restr. Elec
Physics 140A	Earth Sci. 120	Restr. Elec.
Restr. Elec.		

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 20A, 20B, 20C, 20D, 20E, 20F.
3. Three restrictive elective courses in science and engineering (a list of acceptable courses is given below).

† Effective fall 1994, the Department of Mathematics replaced the Mathematics 2 sequence with a new Mathematics 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

Upper-Division

1. Physics 100A-B, 110A-B, 120A, 129 or 130A, 140A or Chemistry 127 or 131.
2. Mathematics 110.
3. Restricted Electives: Sixteen units of upper-division courses in science and engineering (excluding mathematics).

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Physics 100A	Physics 100B	Physics 129 or 130A
Physics 110A	Physics 110B	Mathematics 110
SENIOR YEAR		
Physics 140A (or Chem. 127 or 131)	Physics 120A	Restr. Elec.
Restr. Elec.	Restr. Elec.	Restr. Elec.

Approved Lower-Division Elective Courses

One course in computing chosen from the following list:

AMES 10, FORTRAN for Engineers
AMES 15, Introduction to Engineering Graphics and Design
CSE 10, Introduction to Programming Techniques
CSE 30, Introduction to Systems Programming
Physics 105, 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, 30, or 40.
4. Mathematics 20A, 20B, 20C, 20D, 20E, 20F or 21C, 21D, 20E, 20F.†

†Effective fall 1994, the Department of Mathematics replaced the Mathematics 2 sequence with a new Mathematics 20 sequence. Please refer to the Department of Mathematics' section for a full description of the transition, including recommended entry points and retake substitutions. Please consult the Department of Physics undergraduate advising office for specific changes to major requirements.

Upper-Division

1. Physics 100A-B, 110A-B, 120A, 129 or 130A.
2. Chemistry 140A or 143A.
3. Earth Sciences 101.
4. Mathematics 110.
5. TEP 129A-B-C.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Physics 100A	Physics 100B	Chem. 143A
Physics 110A	Physics 110B	Physics 129 or 130A
Mathematics 110	Chem. 140A	
SENIOR YEAR		
Earth Sci. 101	TEP 129B	TEP 129C
TEP 129A	Physics 120A	

Engineering Physics Program

The engineering physics program is offered jointly by the Departments of Physics, AMES, and ECE, and is administered by the Department of ECE. (See "ECE, Engineering Physics Program.")

Transfer Students

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 three lower-division and three upper-division courses. 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 (619) 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 lower-division physics courses, nine upper-division physics courses, Mathematics 110, and a GPA of a least 3.50 in the physics major.

The Honors Program consists of a minimum of six 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.

The Graduate Program

The Department of Physics offers curricula leading to the following degrees:

M.S., physics
C.Phil., physics
C.Phil., physics (biophysics)
Ph.D., physics
Ph.D., 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.

Master's Degree Program

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 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, an oral topic examination, a qualifying examination, 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, 218B, 218C (Plasma); 234 (Nonneutral Plas.); 235 (Nonlin. Plas. Th.)

Group 2: Physics 210B (Nonequil. Stat. Mech.); 211A, 211B (Solid State); 230 (Adv. Solid State); 236 (Many-body Th.)

Group 3: Physics 214 (Elem. Part.); 215A, 215B, 215C (Part. & Fields); 217A, 217B (Renorm. Field Th.); 233 (Adv. Elem. Part. Th.)

Group 4: Physics 220 (Group Th.); 221A, 221B (Nonlinear Dyn.); Mathematics 210A, 210B, 210C (Mathematics Physics);

Mathematics 259A, 259B, 259C (Geom. Physics)

Group 5: Physics 206 (BioPhysics); 213A, 213B (Nuc.); 216 (Atomic); 225A, 225B (Relativ.); 231 (Collision Th.)

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. ORAL TOPIC EXAMINATION

Physics students are required to take an oral topic examination the first time it is offered after passing the departmental examination. Three topics of current interest in physics or biophysics are announced two weeks prior to the examination week, and a list of relevant references is supplied. Students select one of the topics and present a one-half hour talk on it to a faculty examination committee. The oral presentation is followed by approximately 30–45 minutes of questioning generally related to the topic. This examination is offered twice a year, at the beginning of the fall and spring quarters, and may be repeated once, the next time it is offered.

Biophysics students take this examination no later than the spring of the third year of graduate work.

4. 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.

5. INSTRUCTION IN PHYSICS TEACHING

All graduate students are required to participate in "Instruction in Physics Teaching" under the supervision of a professor as part of their training for future careers. Students will participate in teaching recitation sections, problem sessions, or laboratory sections. Students are required to take a total of two units of Physics 500.

6. 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 lower-division courses are usually offered in the quarters indicated below:

FALL	WINTER	SPRING
Physics 1A	Physics 1A	Physics 1A
Physics 1B	Physics 1B	Physics 1B
Physics 1C	Physics 1C	Physics 1C
Physics 1CL	Physics 1CL	Physics 1CL
Physics 2A	Physics 2A	Physics 2A
Physics 2B	Physics 2B	Physics 2B
Physics 2BL	Physics 2BL	Physics 2BL
Physics 2C	Physics 2C	Physics 2C
Physics 2CL	Physics 2CL	Physics 2CL
Physics 2D	Physics 2D	Physics 2D
Physics 4C	Physics 2DL	Physics 2DL
Physics 5	Physics 4A	Physics 4B
Physics 10	Physics 4D	Physics 4E
Physics 11A	Physics 6	Physics 5
	Physics 7	Physics 8
	Physics 11B	Physics 10

The Physics 1 sequence is intended for biology and chemistry majors.

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.

Physics 5, 6, 7, 10, 11A and 11B are intended for non-science majors. Physics 5, 6, 7 and 10 do not use calculus while Physics 11A and B use some calculus.

1A. General Physics–Mechanics (4)
A calculus-based introductory physics course covering vectors, equilibrium of a particle, motion on a straight line, Newton's second law and gravitation, motion in a plane, work and energy, impulse and momentum, equilibrium of a rigid body, rotation, periodic motion. *Prerequisites: Mathematics 1A and*

concurrent enrollment in Mathematics 1B; or concurrent enrollment in Mathematics 20A. (F,W,S)

1B. General Physics–Electricity and Magnetism (4)
Continuation of Physics 1A covering Coulomb's law, Gauss's law, potential, capacitance, current, resistance and electromotive force, direct-current circuit and instruments, the magnetic field, magnetic forces on current-carrying conductors, magnetic field of a current, induced electromotive force, inductance, magnetic properties of matter and alternating currents. *Prerequisites: Physics 1A and concurrent enrollment in Mathematics 1C or Mathematics 20B.* (F,W,S)

1C. General Physics–Waves, Optics, Relativity, and Quantum Physics (4)
Continuation of Physics 1B covering traveling waves, electromagnetic waves, the nature and propagation of light, geometric optics, interference and diffraction, relativistic mechanics, photons, electrons and atoms, quantum mechanics, atoms, molecules and solids, nuclear physics. *Prerequisites: Physics 1B and Mathematics 1C or Mathematics 20B.* (F,W,S)

1CL. General Physics Laboratory–Electricity and Magnetism and Optics (1)
Four three-hour laboratories covering the cathode ray oscilloscope and wave generator, the R-C circuit, lenses and the eye, and optical spectra and the diffraction grating. *Prerequisites: Physics 1B, and prior or 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)

2AS. Physics–Mechanics (4)
Same as Physics 2A except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Mathematics 20A and concurrent enrollment in Mathematics 20B.* (summer session only 1996–97)

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 or 21C.* (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, 2BS, or 4C.* (F,W,S)

2BS. Physics–Electricity and Magnetism (4)
Same as Physics 2B, except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Physics 2A, Mathematics 20B, and concurrent enrollment in Mathematics 20C or 21C.* (summer session only 1996–97)

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 or 21C, and concurrent enrollment in Mathematics 20D or 21D.* (F,W,S)

2CS. Physics–Fluids, Waves, Thermodynamics, and Optics (4)
Same as Physics 2C, except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Physics 2B, Mathematics 20C or 21C, and concurrent enrollment in Mathematics 20D or 21D.* (summer session only 1996–97)

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. (Students may not receive credit for both Physics 1CL and Physics 2CL.) *Prerequisites: Prior or concurrent enrollment in Physics 1C, 2C, 2CS, or 4D.* (F,W,S)

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, Schrödinger's equation, atomic view of solids, natural radioactivity. *Prerequisites: Physics 2B and Mathematics 20D or 21D.* (F,W,S)

2DS. Physics–Relativity and Quantum Physics (4)
Same as Physics 2D except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Physics 2B and Mathematics 20D or 21D.* (summer session only 1996–97)

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, 2DS, or 4E.* (W,S)

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 or 21C.* (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 or 21C and concurrent enrollment in Mathematics 20D or 21D.* (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 or 21D and concurrent enrollment in Mathematics 20E.* (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 20F.* (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. (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. (W)

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. (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. (S)

10. Concepts in Physics (4)
This is a one-quarter general physics course for nonscience 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.* (F,S)

11A. Introduction to General Physics (4)
First quarter of a two-quarter introductory physics course for non-science majors covering selected topics in classical and modern physics. The course gives a quantitative treatment of physical phenomena, introducing basic physics concepts and using calculus and other mathematics where applicable. Topics are taken from mechanics, waves, thermodynamics, and electricity. A laboratory requirement consists of two experiments of the student's choice. *Prerequisites: Mathematics 1A or 20A and concurrent enrollment in Math 1B or 20B.* (F)

11B. Introduction to General Physics (4)
Second quarter of a two-quarter introductory physics course for non-science majors covering topics in classical and modern physics. Topics are taken from magnetism, electromagnetic radiation, relativity, quantum mechanics, atomic and nuclear physics, and cosmology. The laboratory requirement consists

of two experiments of the student's choice. *Prerequisites: Physics 11A and Mathematics 1B or 20B.* (W)

90. Undergraduate Seminar–Physics Today (1)
Undergraduate seminars organized around the research interests of various faculty members. *Prerequisite: none.* (F,W,S)

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 or 21D; 20E, 20F.* (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)

105. Computational Physics (4)
A laboratory-lecture course on practical computer programming, numerical methods and applications to physics problems. Problems in classical mechanics, quantum mechanics, statistical physics, and electromagnetism are solved using numerical techniques such as: root finding, interpolation, numerical differentiation and integration, and Monte Carlo methods. Use of graphics to interpret results. Some previous programming is expected. Two hours lecture, three hours laboratory. *Prerequisites: Physics 4E or 2D or equivalent; Mathematics 20E and 20F.* (F,S)

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 or 21D, 20E, 20F (co-registration 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-B.* (W,S)

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-B or equivalent.* (F)

125. The Physical Universe (4)
Survey of current astrophysical knowledge for science and engineering majors or students with strong preparation in physics and mathematics. Topics will include: properties of stars; stellar structure and evolution; physics of white dwarfs; neutron stars and black holes; the interstellar medium; the Milky Way and other galaxies; active galaxies and quasi-stellar objects; gravitation, cosmology, and the Big Bang. Four hours lecture. *Prerequisite: Prior or concurrent enrollment in Physics 2D, 4E, or equivalent, or consent of instructor.* (S)

129. Introduction to Quantum Theory (4)
Particle-wave duality and empirical basis of quantum theory. Probability amplitudes and probability distributions. Wave mechanics and reduction to Newtonian mechanics. Schrödinger equation and hydrogenic wave functions. Semiclassical theory of radiation. Stern-Gerlach experiment and half-integer angular momentum. Spin, statistics, and the periodic table. Selected topics on periodic table. Selected topics on applications of quantum theory. *Prerequisites: Physics 2D, Mathematics 20D or 21D; 20F.* (S)

130A. Quantum Physics (4)
Phenomena which led to the development of quantum mechanics. Wave mechanics; the Schrödinger 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: Mathematics 110 or equivalent, 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)

131. Modern Physics Laboratory (2)
Experiments in radioactivity, X-rays, atomic physics, resonance physics, solid-state physics, etc. Four hours laboratory. *Prerequisites: Physics 2CL and 2DL, Physics 130A.* (W)

132. Modern Physics Laboratory (2)
Experiments in atomic physics, optics, physical electronics, fluid dynamics, surface physics, etc. Four hours laboratory. *Prerequisites: Physics 2CL and 2DL, Physics 130A-B.* (S)

133. Condensed Matter/Materials Science Laboratory (2)
A project-oriented laboratory course utilizing state-of-the-art experimental techniques in materials science. Preparation and characterization of thin film and bulk materials with emphasis on superconductivity and magnetism. *Prerequisites: Physics 2CL-DL.* (S)

140A. Statistical and Thermal Physics (4)
Statistical description of physical systems, the concepts of ensembles, entropy and temperature, the thermodynamic laws, thermodynamic potentials, and the ideal gas. Four hours lecture. *Prerequisites: Physics 110A or equivalent, and 130A, or consent of instructor.* (F)

140B. Statistical and Thermal Physics (4)
Bose-Einstein and Fermi-Dirac statistics, phase transitions, fluctuation and transport phenomena. Applications to the non-ideal gas, radiation, and chemical and condensed matter physics. Four hours lecture. *Prerequisites: Physics 130B and 140A.* (W)

151. Plasma Physics (4)
Particle motions, plasmas as fluids, waves, diffusion, equilibrium and stability, nonlinear effects, controlled fusion. Three hours lecture. *Prerequisites: Physics 100A-B and 110A.* (S)

152. Introduction to Condensed Matter Physics (4)
Crystal symmetry, free electron gas, band structure, properties of insulators, semiconductors and metals; atomic diffusion, alloys, electric transport phenomena. Four hours lecture. *Prerequisites: Physics 130B, concurrent enrollment in 140B.* (W)

153. Topics in Biophysics/Photobiology (4)
(Course content varies yearly.) Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. Three hours lecture. (Same as BIBC 153, Chemistry 153.) *Prerequisite: upper-division standing in biology, chemistry, or physics, or consent of instructor.* (S)

154. Nuclear and Particle Physics (4)
Elementary nuclear physics. Quantum mechanics of radiation. Elementary particles and scattering. *Prerequisites: Physics 100C and 130B.* (S)

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. Physics 160, 161, 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, upper-division standing in physical science or engineering.* (F)

161. The Galaxy and the Interstellar Medium (4)
The physics of the interstellar medium: thermal and nonthermal processes, 21 cm radiation, ionized hydrogen regions, supernovae and supernovae remnants; the physics and chemistry of interstellar dust; star formation, the structure of the Milky Way galaxy, stellar motions and distances, stellar populations. Physics 160, 161, 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. Some outside preparation may be required for students who have not taken Physics 160. *Prerequisites: Physics 2 or 4 sequence or equivalent, upper-division standing in physical science or engineering.* (W)

162. Galaxies and Cosmology (4)
The structure and properties of normal galaxies, galaxy rotation and dynamics, galaxy formation and evolution, the physics of active galactic nuclei: radio galaxies, Seyfert galaxies and quasi-stellar objects, the extragalactic distance scale, and physical cosmology. Physics 160, 161, 162 may be taken as a three-quarter sequence for students interested in pursuing graduate study in astrophysics or individually as topics of interest. Some outside preparation may be required for students who have not taken Physics 160 and 161. *Prerequisites: Physics 2 or 4 sequence or equivalent, upper-division standing in physical science or engineering.* (S)

182. Atmospheric Physics and Flight Aerodynamics (4)
The application of thermodynamics and fluid mechanics to a study of the earth's atmosphere and to the flight of aircraft in that atmosphere. Topics include winds, stability, fronts, cloud physics, lift, drag, aircraft stability, and performance. Three hours' lecture. *Prerequisites: upper-division standing in physical science, engineering, or consent of instructor.* (S)

195. Physics Instruction (2)
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)

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. *Prerequisites: 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 BIOG 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)

210A. Equilibrium Statistical Mechanics (5)
Thermodynamic potentials; equation of state; cluster expansion for interacting systems. Quantum statistics. Bose condensation. Phase transitions via mean field theory. Ising model and critical phenomena. *Prerequisites: Physics 140A-B, 152, or equivalent; concurrent enrollment in Physics 212C.* (S)

210B. Nonequilibrium Statistical Mechanics (4)
Transport phenomena; kinetic theory of gases; Boltzmann equation; Chapman-Enskog method; stochastic processes; Langevin and Fokker-Planck equation; BBGKY hierarchy; molecular dynamics; quantum kinetics. Fluctuation-dissipation theorem. Other topics may include: Kubo's formula; dispersion relations; Onsager reciprocity; conduction and diffusion. Fluids; hydrodynamic modes; nonlinear effects and mode-mode coupling; Benard convection, BZ reaction; turbulent mixing and Kolmogorov spectrum. First order phase transitions; nucleation; spinodal decomposition. *Prerequisite: Physics 210A.* (F)

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 152 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, 212B.* (S)

213A-B. Theoretical Nuclear Physics (4-4)
Basic phenomenology of strong interactions; two and three nucleon systems; weak and electromagnetic interactions of nucleons; thermonuclear reactions; nuclear systematics, models of nuclear structure, particle-transfer reactions, fission; introductory BCS pairing and nuclear matter theory. *Prerequisites: Physics 130C or equivalent, Physics 212C.* (F,W)

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, 215B.* (Offered in alternate years.) (S)

216. Atomic and Molecular Physics (4)
Structure of atoms, the Hartree-Fock method, correlation energy and relativistic corrections. Structure of molecules, the Born-Oppenheimer method, the molecular electronic state, the stability and build-up of molecules, molecular orbital theory. The interaction of atoms and molecules with external fields. Atomic and molecular collisions. *Prerequisite: Physics 212A.* (W)

217A-B. Renormalization in Field Theory, the Renormalization Group, and Critical Phenomena (4-4)
The pertinent concepts and ideas in the theory of critical phenomena are explained using the field theory techniques of renormalization and the renormalization group. Modern applications of the renormalization group in quantum chromodynamics and the electroweak model are discussed in part B. Part A is oriented towards condensed matter and particle physics theorists. The focus of part B is on particle physics. *Prerequisite: Physics 212C or consent of instructor.* (S,F)

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).

220. Group Theoretical Methods in Physics (4)
Study of the representations and applications of groups to problems in physics, with particular emphasis on the permutation of 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)

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. Nucleocosmo-chronology 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 (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. *Prerequisite: Physics 211B.* (Offered in alternate years.) (S)

231. Collision Theory (4)
Collision theory and its application to atomic and molecular processes. Description of collision processes, scatterings and resonances in composite systems. Rearrangement collisions and the methods of approximation. *Prerequisites: Physics 212A-B.* (S/U grades permitted.) (S)

233. Advanced Elementary Particle Theory (4)
Current problems in elementary particle theory. *Prerequisite: Physics 215A.* (S/U grades permitted.) (W)

234. Nonneutral Plasmas (4)
This course treats the physics of nonneutral plasmas. Topics include equilibrium, stability, transport, linear modes and instabilities, and the effects of strong correlation and strong magnetization. *Prerequisite: Physics 218C or consent of instructor.* (Offered in alternate years.) (F)

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)

236. Many-Body Theory (4)
Effects of interactions in large quantum mechanical systems at zero or finite temperature analyzed from a unified viewpoint. Symmetries, conservation laws, perturbation theory, sum rules, inequalities. Applications to Bose, Fermi, normal, superfluid, charged, neutral, degenerate, dilute, etc., systems. *Prerequisites: Physics 210A-B, 212C.* (Offered in alternate years.) (S)

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)

255. Theoretical Solid-State Seminar (0-1)
Discussions of current research in theoretical solid-state 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. Nonlinear and Nonequilibrium Physics Seminar (0-1)
Discussions of recent research in nonlinear and nonequilibrium physics. (S/U grades only.) (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

Professors

Nathaniel L. Beck, Ph.D.
Amy Bridges, Ph.D.
Ellen T. Comisso, Ph.D.
Wayne A. Cornelius, Ph.D.
Peter F. Cowhey, Ph.D.
Gary W. Cox, Ph.D.
Paul W. Drake, Ph.D.
Peter A. Gourevitch, Ph.D.
H. N. Hirsch, 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.
Sanford A. Lakoff, Ph.D., *Professor Emeritus*
Arend Lijphart, Ph.D., *Professor Emeritus*
Mathew D. McCubbins, Ph.D.
Samuel L. Popkin, Ph.D.
Susan L. Shirk, Ph.D.
Peter H. Smith, Ph.D.
Kaare Strom, Ph.D.
Tracy B. Strong, Ph.D.

Adjunct Professors

Stephen Haggard, Ph.D.
Daniel Hallin, Ph.D.
Miles Kahler, Ph.D.

Associate Professors

Ann L. Craig, Ph.D.
Steven P. Erie, Ph.D.
Alan C. Houston, Ph.D.
Victor V. Magagna, Ph.D.
David R. Mares, Ph.D.
Philip G. Roeder, Ph.D.

Adjunct Associate Professor

Matthew Shugart, Ph.D.

Assistant Professors

Elisabeth R. Gerber, Ph.D.
Arthur W. Lupia, Ph.D.
Paul A. Papayoanou, Ph.D.
Gary A. Shiffman, Ph.D.

Adjunct Assistant Professors

Richard Kronick, Ph.D.

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.

Majors are required to take the full introductory sequence made up of 10, 11 and 12, and any twelve four-unit upper-division courses in political science. All political science majors are strongly encouraged to take at least one quarter of the PS 110A-B-C sequence and PS 170A. The department also requires that all students declaring the political science major as of fall 1986 take a course in elementary statistics for the social sciences (PS 60, or Soc. Sci. 60; effective fall 1996 the department no longer accepts Psych. 60). This course should preferably be taken by the second quarter of the student's junior year. Students may substitute either PS 170A or Economics 120A for this requirement, or petition for an equivalency.

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 in residence at UCSD. Courses taken elsewhere may be credited toward the major. Please check with the undergraduate coordinator 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).

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 coordinator.

Double majors who include political science as one of their two majors must fulfill the requirements of both programs. They must take at least twenty-two upper-division courses, including ten in each major. Please consult the undergraduate coordinator for more information.

Students must maintain an overall 2.0 GPA in the major. To be counted toward satisfying the requirements for the major or minor, 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).

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, and a recommendation from a political science faculty member are currently prerequisites for honors.) These courses may be counted toward the upper-division requirement.

"Areas of concentration" within the upper-division curriculum are identified to help guide students in course selection and program planning. Outside of the lower-division sequence there are no breadth requirements.

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.

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 the prelaw adviser.

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 policy analysis courses and American or comparative politics as an area of concentration. 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, for an *Undergraduate Student Handbook*.

Areas of Concentration

The Department of Political Science offers four primary areas of concentration. These areas are distinguished for purposes of career guidance. At this time, the Department of Political Science does not require, but encourages, students to take courses in the different areas of concentration.

Course work in other departments may complement student preparation in each area of concentration as noted below. However, the twelve upper-division courses for the major must all be in political science.

More detailed information on areas of concentration is available in the department's *Undergraduate Handbook*.

AMERICAN POLITICS

Courses focusing on American institutions and processes, as well as constitutional law, American political development, public policy analysis, and urban politics are listed in this area. PS 10 is the foundation course. Students with a special interest in American politics are encouraged to take courses in American history and economics (any introductory sequence). See the course listings for prerequisites and sequencing.

POLITICAL THEORY

This area of concentration includes courses focusing on the tradition of political discourse and analysis as well as specific questions of political philosophy.

PS 110A, 110B, and 110C provide the foundation for a concentration in political theory and an introduction to the broader normative and analytic questions of political science. They should precede the more advanced courses. Students of political theory are encouraged to examine the offerings in the Department of Philosophy (recommended are Phil. 101-107, and 120).

COMPARATIVE POLITICS

PS 11 is the foundation course for the concentration in comparative politics. For upper-division courses, students are encouraged to mix theoretically informed courses with courses focusing on specific geographic areas. Some courses in international relations may also complement this field of concentration. Students should consider enrolling in history and foreign language courses in conjunction with their area interests in political science. Courses in anthropology and sociology often complement a comparative politics area of concentration, and the introductory sequence in economics is useful.

INTERNATIONAL RELATIONS

PS 12 is the foundation course for an international relations area of concentration. In addition to courses within this field, students' career goals may be served by courses in American politics, political economy, or comparative politics. Students of international relations should consider studying American diplomatic history, European diplomatic history, and international economics. Students who wish to go on to a diplomatic career should become fluent in at least one foreign language.

Specialized Programs

Students may choose to design their own area of concentration based on courses drawn from more than one of the fields listed above. In this option, courses would be selected based on a student's interest and career objectives. The following are examples of two specialized areas of concentration:

Political economy encompasses two sets of courses culled from virtually all the other areas of concentration. The first set of courses concerns the interrelationship between the political and economic orders (for example 102B, 126AA-AB, 138A, and 144AA). The second set of courses concerns the use of the methodology associated with economic analysis in order to address political questions (for example 100DA and 112A).

Latin American politics is built around courses in comparative politics and international relations. Upper-division courses are of two types: specific country studies (for example 134B or 134I) and topical courses (for example 134AA or 134D). This program of study could also include courses drawn from the general fields of comparative politics and international relations which are not focused on Latin America.

Minor in Political Science

Students wishing to minor in political science are advised to take the introductory sequence and three upper-division courses, but students may choose to substitute upper-division courses for any of the three lower-division offerings. Students must follow the grading policy for a minor at their college.

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: Amy Bridges, coordinator, Urban Studies Program; Stephan Haggard, coordinator, Project in International Security Affairs; Germaine Hoston, director, Center for Democratization and Economic Development; Mathew McCubbins, director, Law and the Behavioral Sciences Project; Samuel Popkin, coordinator, American Political Institutions Project; Susan Shirk, director, Institute on Global Conflict and Cooperation; Peter Smith, director, Latin American 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. Students present exams in two of these fields. In their first field, students also present a focus area (such as legislative behavior, Latin America, international political economy, or modern 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. These eighteen courses include only two required courses (political theory and empirical research); they also include independent studies and reading courses. Students also attend regularly scheduled colloquia which feature presentations by faculty, outside speakers, and dissertation students.

During the first two years each student must take at least two specially designated research seminars (at least one in each of the two exam fields). Each seminar is devoted primarily to the completion of a seminar paper (thirty to forty pages) involving original research or other creative effort.

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 their third year. Students who have done prior graduate work should be able to complete their exams by 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 thesis.

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 graduate brochure 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.

27. Ethics and Society (4)
(Same as Phil. 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.

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.

60. Elementary Statistics for Political Science (4)
Introduction to the basic statistical analysis of political science data, including descriptive and inferential statistics. Included

is a laboratory component involving the use of computer-based programs for statistical analysis. Credit not allowed for both PS 60 and Soc. Sci. 60, Psych. 60, and Math. 6A.

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. *Prerequisite: PS 10 or consent of instructor.*

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. *Prerequisite: PS 10.*

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. *Prerequisite: PS 10 or consent of instructor.*

100DA. Voting, Campaigning, and Elections (4)
This course will consider the nature of public opinion and voting in American government. Studies of voting behavior will be examined from the viewpoints of both citizens and candidates, and an effort will be made to develop models of their electoral behavior. Attention will also be devoted to recent efforts to develop rational choice theories of electoral behavior and to critiques of elections as democratic institutions. The role of the mass media and money also will be examined. *Prerequisite: PS 10 or consent of instructor.*

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: PS 10 or consent of instructor.*

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. *Prerequisite: PS 10 or consent of instructor.*

100I. The Washington Community (4)
For students who plan to intern in Washington. It examines the way Washington's elected officeholders, government officials, news media, and interest group representatives transact the public's business. History of Washington as a community will also be covered. *Prerequisite: department stamp required. Application for internship must be submitted to AIP office or consent of instructor.*

102B. Politics of American Economic Policy (4)
(Formerly PS 176) The impact of politics on American post-war economic policy making. Causes and solutions to America's current economic problems. Evaluation of the political dimensions of policy making in the Reagan and earlier administrations. Consideration of Marxian, liberal, and other interpretations of policy outcomes will be discussed. *Prerequisite: PS 10 or consent of instructor.*

102C. American Political Development (4)
(Formerly PS 122) 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 insitutionalism." *Prerequisites: PS 10 and 11.*

102DA-DB. Public Opinion and Political Ideology (4-4)
(Same as Com/SF 124A-B.) The structure, origins, and dynamics of public opinion and political ideology. 102DA considers the nature of public opinion and the factors that shape the development of political ideas–economic interests, psychological function, political communication and organization, etc. 102DB examines the development of political ideas in specific historical situations. *Prerequisite: PS 10 or consent of instructor.*

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. *Prerequisite: PS 10 or consent of instructor.*

102G. Special Topics in American Politics (4)
(Formerly PS 163) An undergraduate course designed to cover various aspects of American politics. *Prerequisite: PS 10.*

102H. Political and Legal Foundations of the American Economy (4)
An examination of the political and legal arrangements necessary for the working of the modern American economy. Particular attention is given to the development of rules about private property. Insights from the "law and economics" fields are also considered. *Prerequisite: PS 10 or consent of instructor.*

102IA-IB. The American News Media (4-4)
(Same as Com/Cul 171A-B and Soc./C 165A-B.) History, politics, social organization, and ideology of the American news media. 102IA surveys the development of the news media as an institution, from earliest newspapers to modern mass news media. 102IB deals with special topics, including the nature of television news, and with methods of news media research, and requires a research paper. *Prerequisites: for 102IA, PS 10; 102IA is required for 102IB or consent of instructor.*

102J. Advanced Topics in Urban Politics (4)
In this seminar students will do original research on selected topics in urban politics. Special attention will be paid to patterns of urbanization and class, the methods by which political leaders mobilize power, and the economic impacts of such urban political structures as the party machine and federal social programs. *Prerequisite: PS 10 or consent of instructor.*

102JJ. Field Research in Urban Politics (4)
To be taken with PS 102J, this course allows students to do original field research on topics in urban politics. Should additional time be needed for project completion, an IP grade can be awarded at instructor's discretion. *Prerequisite: consent of instructor.*

102L. The Politics of Regulation (4)
Political and policy-making issues in regulation. Themes: regulation versus legislation; general versus specific grants of regulatory power; market versus command mechanisms; private property; and risk assessment. Emphasis on American regulatory policy, examples from current regulatory debates (e.g., health care and environment). *Prerequisites: PS 10 required and one quarter of economics recommended.*

103A. California Government and Politics (4)
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. *Prerequisite: PS 10 or consent of instructor.*

104A. The Supreme Court and the Constitution (4)
(Same as ETHN 155.) 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. *Prerequisite: PS 10 or consent of instructor.*

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. *Prerequisite: PS 10 or consent of instructor.*

104C. Civil Liberties—The Rights of Criminals and Minorities (4)
(Same as ETHN 156.) 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.

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. Junior or senior standing required, as is consent of the instructor.

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. *Prerequisite: PS 10 or consent of instructor.*

104L. Positive Political Theory of Law (4)
We will discuss modern theories of the origins of law and legal behavior. *Prerequisite: PS 10.*

106A. Politics and Bureaucracy (4)
This course explores the problematic relationship between politics and bureaucracy. The theoretical perspectives of Weber, the Marxists, and the pluralists will be employed to understand the character of American bureaucratic development in the twentieth century. *Prerequisite: PS 10 or consent of instructor. PS 100A or 100B strongly recommended.*

107A. Gay and Lesbian Politics (4)
A consideration of the historical interrelationship between religious, psychological, and social constructs of homosexuality, the embodiment of these constructs in the law, and their use in the political arena.

Political Theory

110A. Systems of Political Thought (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. Systems of Political Thought (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. *Prerequisite: PS 110A recommended.*

110C. Systems of Political Thought (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. *Prerequisite: PS 110B recommended.*

110DA. Contemporary Political Thought (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. *Prerequisites: sophomore standing, two courses in philosophy, or political or social theory.*

110DC. Seminar: Contemporary Political Theory (4)
This course focuses on selected theories and topics since the mid-nineteenth century. Theorists will include Nietzsche, Max Weber, Lenin, Freud, and Foucault. Topics will include authority, power, and political leadership. May be repeated once with instructor's permission. *Prerequisites: juniors and seniors with at least three courses in political theory, social theory, philosophy, European intellectual history, or consent of instructor.*

110EA. American Political Thought (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 (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.

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)
(Same as HIUS 126.) 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.

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. *Prerequisite: upper-division standing.*

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.

112B. Politics, Philosophy, and Social Science Methodology (4)
An introduction to philosophy and the political implications of social science. Topics considered will include the nature of theory and evidence, the formulation of research questions, special problems in the study of human behavior or action and the relation between social science and public policy, events, and ideologies. *Prerequisite: upper-division standing or consent of instructor.*

112C. Political Theory and Artistic Vision (4)
The course explores the modes of political thinking found in arts, especially in drama and literature. It focuses on particular topics (e.g., ends and means, political leadership, political economy). Some attempt will be made to develop implications inherent in art for the writing of political theory as a genre.

113B. Chinese and Japanese Political Thought (4)
An examination of the competing philosophical traditions of ancient and modern China and Japan, with an eye toward understanding how these have been reflected in Chinese and Japanese development. Readings and class sessions will be in English, although students with Chinese or Japanese language capability will be given the opportunity to use their special skills. *Prerequisites: PS 110A, 110B, or 110C, or one other course in political theory.*

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. *Prerequisites: PS 110A and PS 110B.*

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. *Prerequisite: PS 10 or 11.*

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. *Prerequisite: PS 10 or 11.*

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.*

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. *Prerequisite: upper-division standing or consent of instructor. Two courses in philosophy or political or social theory are recommended.*

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. *Prerequisites: PS 10, 11, or consent of instructor.*

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. *Prerequisite: PS 11 or consent of instructor.*

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. *Prerequisite: PS 11 or consent of instructor.*

120C. Politics in France (4)
The course will examine the consequences of social and economic change in France. Specific topics will include institutional development under a semipresidential system, parties and elections, and how well the country is prepared for the European Community market inaugurated in 1993. *Prerequisite: PS 11 or consent of instructor.*

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. *Prerequisite: PS 11 or consent of instructor.*

120E. Scandinavian Politics (4)
Introduction to the politics and societies of the Scandinavian states (Denmark, Finland, Norway, and Sweden). Focuses on historical development, political culture, constitutional arrangements, political institutions, parties and interest groups, the Scandinavian welfare states, and foreign policy. *Prerequisite: PS 11 or consent of instructor.*

120F. Government and Politics in Spain (4)
This course will analyze the role of Spain in the world political economy from the sixteenth century, the consolidation of the state, the continued development and control under Franco, and the emergence of democracy since 1975. Students who have gone to Spain or plan to do so in the Education Abroad Program are especially encouraged to enroll. *Prerequisite: upper-division standing.*

120G. British Politics (4)
Emphasis will be placed on the interaction between British political institutions and processes and contemporary policy problems: the economy, social policy, foreign affairs. The course assumes no prior knowledge of British politics, and comparisons with the United States will be drawn. *Prerequisite: PS 11 or consent of instructor.*

122A. Authoritarian Politics (4)
This lecture course explores alternative approaches to the analysis of authoritarian regimes. The readings draw from cases on all continents. Special attention will be given to the political institutions of these regimes. *Prerequisite: PS 11.*

123A-B. Comparative Parliamentary Studies (4-4)
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. *Prerequisites: PS 11 for 123A; 123A for 123B.*

124A. Political Consequences of Electoral Systems (4)
A comparative survey of the major dimensions of the electoral systems used in contemporary democracies (including plurality and majority systems, proportional representation, and districting methods) and of their effects on party competition. *Prerequisite: PS 11 or consent of instructor.*

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. Fundamentals of Political Economy: Problems of Development 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. *Prerequisite: PS 11 or consent of instructor.*

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.

130AB. The Soviet State and Society (4)
An historical and topical survey of the transformation of Soviet society by the policies of the Communist Party. Special attention to the Leninist developmental strategy and the contemporary problems of socialization, economic reform, and particularistic nationalisms. (May not receive credit if 130AA was taken winter 1988 or winter 1989.) *Prerequisite: PS 11 or consent of instructor.*

130AC. Seminar: Soviet Politics (4)
Undergraduate research seminar on changes in the 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. *Prerequisite: PS 11.*

130B. Politics in the People's Republic of China (4)
This course analyzes the political system of China since 1949, including political institutions, the policy-making process, and the relationship between politics and economics. The main focus is on the post-Mao era of reform beginning in 1978. Prerequisite: PS 11 or consent of instructor.

130H. Vietnam: The Politics of Intervention (4)
(Formerly PS 133B) 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. *Prerequisite: PS 11 or consent of instructor.*

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. *Prerequisite: PS 11 or consent of instructor.*

132A. Political Modernization Theory (4)
(Formerly PS 139) A survey of state building and the politics of economic development in a world historical perspective. *Prerequisite: PS 11 or consent of instructor.*

132B. Modernity and Identity in East Asia (4)
An intensive examination of the quests for modernity undertaken by Chinese and Japanese leaders from the mid-nineteenth century to the present. Emphasis is placed upon the relationship among indigenous values, international pressures, and issues concerning national identity. *Prerequisite: PS 11.*

133A. Introduction to Japanese Politics (4)
This course will analyze the political systems of modern Japan in comparative-historical perspective. *Prerequisite: PS 11 or consent of instructor.*

133B. Political Economy of the East Asian Newly Industrialized Countries (NICs) (4)
An introduction to the interrelationship between political and economic development in the newly industrializing countries of East Asia. Primary focus is on Korea and Taiwan, with brief coverage of Singapore and Hong Kong, and some comparisons with other developing countries. *Prerequisite: PS 11 or consent of instructor.*

133E. Public Policy in Japan (4)
This course combines an examination of general models of the way in which public policy is made in Japan, and a review of outcomes in several substantive policy areas, such as education, public works, health and welfare, and pollution. *Prerequisite: PS 11 or consent of instructor.*

134AA-AB. Comparative Politics of Latin America (4-4)
(Formerly PS 187A-B) 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 domestic 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 first quarter. Intensive study of Chile and Cuba in second quarter. *Prerequisites: PS 11 or consent of instructor for 134AA; PS 134AA for 134AB.*

134B. Politics in Mexico (4)
(Formerly PS 183) General survey of the Mexican political system as it operates today. Emphasis on sources of stability and instability in the contemporary Mexican state, relationships between the state and various segments of Mexican society (economic elites, peasants, urban labor, and the Church); Mexico's international economic relations, including its massive indebtedness to foreign banks. *Prerequisite: PS 11 or consent of instructor.*

134C. Politics in Mexico: Research Seminar (4)
Continuation of PS 134B. Individual and group research on selected topics in Mexican politics, public policy, and development, grounded in readings and discussions in 134B. Use of primary data sources (survey data, electoral statistics, ethnographic and archival data) strongly encouraged. *Prerequisite: PS 134B.*

134D. Selected Topics in Latin American Politics (4)
(Formerly PS 131) A comparative analysis of contemporary political issues in Latin America. Material to be drawn from two or three countries. Among the topics: development, nationalism, political change. *Prerequisite: PS 11 or consent of instructor.*

134G. Politics in the Andes (4)
A comparative examination of twentieth-century political conflicts and currents in the Andean countries of South America: Bolivia, Colombia, Ecuador, and Peru. Topics include economic underdevelopment, Indian relations, militarism, guerrilla warfare, and revolutionary movements. *Prerequisite: PS 11 or consent of instructor.*

134I. Politics in the Southern Cone of Latin America (4)
This course is a comparative analysis of twentieth-century political developments and issues in the Southern Cone of Latin-America: Argentina, Chile, and Uruguay. The course will also examine the social and economic content and results of contrasting political experiments. *Prerequisite: PS 11 or consent of instructor.*

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. *Prerequisite: PS 11 or consent of instructor.*

134P. Organizing Women in Latin America (4)
Survey of women's participation in formal political institutions in Latin America (public bureaucracies, political parties, trade unions, peasant organizations), the politics of gender in recent women's movements, and the impact on women of democratization and neoliberal economic policies. *Prerequisite: PS 11 or consent of instructor.*

134Q. Organization, Resistance, and Protest in Latin America (4)
Comparative, case-based study of historical and contemporary political organizations and social movements in Latin America. Emphasis on local and regional activism through politicized urban neighborhood and church groups, trade unions, and peasant organizations. Focus on group objectives, strategies, and identities. *Prerequisite: PS 134AA or consent of instructor.*

134R. Political Parties in Latin America (4)
(Formerly PS 146D) Compares and contrasts different types of political parties in Latin America; conservative, liberal, populist, christian, democratic, socialist, and communist. Investigates their origins, ideologies, programs, leadership, followings, organizations, and successes or failures within varying political systems in different countries. *Prerequisite: PS 11 or consent of instructor.* Cannot also receive credit for PS 146D.

135A. Ethnic Conflict in the Third World (4)
(Same as ETHN 157.) A comparative analysis of ethnic conflict and of conflict resolution by consociational methods in Lebanon, Cyprus, Malaysia, Burundi, and South Africa. Comparisons will also be made with the United States, other Western countries, and other Third World countries. *Prerequisite: PS 11 or consent of instructor.*

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. *Prerequisite: PS 11 or consent of instructor.*

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.*

138A. The Political Economy of Urbanization (4)
(Formerly PS 188) The central theme of this course is public policy and its relationship to the spatial distribution of population and wealth. Case materials are drawn from the experience of Latin American and African countries, with comparative reference to selected Asian nations, the U.S., and Western Europe. *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. *Prerequisite: PS 11.*

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. *Prerequisite: PS 11 or 12 or consent of instructor.*

139B. Politics of the Ancient World Order (4)
A continuation of 139A examining the domestic and international political orders of the ancient West. *Prerequisites: PS 11, 12, or 139A.*

International Relations

140B. Concepts and Aspects of Revolution (4)
Introduction to the analytical and comparative study of revolutionary movements and related forms of political violence. Topics include: the classical paradigm; types of revolutionary episodes; psychological theories; ideology and belief systems; coups; insurgencies; civil wars; terrorism and revolutionary outcomes. *Prerequisite: PS 12 or consent of instructor.*

141. Seminar: Game Theory and International Relations (4)
This course covers the rudiments of game theory and its use in the study of international relations to explore various substantive and theoretical issues. *Prerequisites: PS 12 and one upper-division course in international relations.*

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.*

142I. National and International Security (4)
A survey of theories of defense policies and international security. *Prerequisite: PS 12 or consent of instructor.*

142J. National Security Strategy (4)
A survey of American strategies for national defense. Topics may include deterrence, coercive diplomacy, limited war, and unconventional warfare. *Prerequisite: PS 12 or consent of instructor.*

144AA. Politics and the International Economic Order (4)
(Formerly PS 155A-B) 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. *Prerequisites: PS 12 and one quarter of economics.*

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.*

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.*

146A. The U.S. and Latin America: Political and Economic Relations (4)
Two central issues in U.S. relations with Latin America will be explored: 1) U.S. policies toward revolutionary and authoritarian regimes in the region; 2) changes in Latin American economic dependence on official aid and private investments from the U.S. These issues will be studied in historical perspective, looking toward policy issues for the 1980s and also at current problems in U.S. relations with two or three selected Latin American countries. *Prerequisite: PS 11, 12 or consent of instructor.*

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 insitutions, 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.*

147A. Soviet Foreign Policy
This course analyzes Soviet international behavior over seven decades, with particular attention to the period of Soviet superpower status. Close attention will be given to competing explanations for Soviet behavior, to the diverging assessments of Soviet power, and to specific modes of Soviet behavior such as weapons procurement, military intervention, and arms control compliance. *Prerequisite: PS 12 or consent of instructor.*

148A. Japan in the World Economy (4)
This course will examine the challenge of the new form of capitalism as developed in Japan. Historical, economic, and political perspectives will be included. *Prerequisite: PS 11 or 12.*

150A. Immigration Policy and Politics (4)
(Same as ETHN 158.) Comparative analysis of attempts by the U.S., western Europe, and Japan to initiate, regulate, and restrict immigration from Third World, 1940 to present. Social and economic factors shaping immigration policies, anti-immigrant movements, and political parties in industrialized countries. *Prerequisite: upper-division status.*

150B. Immigration Policy and Politics: Research Seminar (4)
Continuation of PS 150A. Individual and group research on selected topics in the field of comparative immigration studies, including immigration policy-making processes, results of immigration policies, and impacts of immigration on sending and receiving countries (U.S., Canada, Europe, Japan). *Prerequisites: PS 150A; permission of instructor; department stamp; students must be interviewed by instructor.*

151. Seminar: Theories of International Relations (4)
This course will examine the efforts to develop models and theories of international relations from Hobbes to the present. Theories and approaches will be studied through analysis of current and historical cases. *Prerequisite: PS 11 and 12 and consent of instructor.*

152. Comparative Foreign Policy (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. *Prerequisite: PS 12.*

Policy Analysis

160AA. Introduction to Policy Analysis (4)
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. *Prerequisite: PS 10 or consent of instructor.*

166F. The American Welfare State (4)
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. *Prerequisite: PS 10 or consent of instructor.*

167A-B. Seminar: Public Policy Analysis (4-4)
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.*

Research Methods

170A. Quantitative Political Science
This course is an advanced introductory course for undergraduates. It will acquaint students with statistical methodology as it is used in the social sciences. It is assumed that the student has the mathematical aptitude to progress through the materials a bit faster than in a true introductory course. *Prerequisite: Soc. Sci. 60 or equivalent or consent of instructor.*

180. Advanced Topics in Political Science (4)
A focused seminar survey of selected theories, concepts, and methods within each of four fields of political science: American politics, comparative politics, international relations, and political theory. Taught in sections by field. Intended for juniors considering an honors thesis or seniors. *Prerequisites: PS 10, 11, and 12. GPA minimum 3.3 or consent of instructor.*

181. Field Research Methods (4)
Introductory survey of methods used by political and other social scientists to gather primary research data, including sample surveys, "elite" interviewing, ethnographic observation, and archival research. Students will have opportunities for practical application of one or more of these methods. *Prerequisites: PS 10, 11, or 12; permission of instructor; department stamp; student must be interviewed by 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. *Prerequisites: department stamp; senior standing; PS major with 3.5 GPA or consent of instructor; significant writing project and recommendation by political science faculty member.*

195. Teaching Apprentice-Undergraduate (4)
Teaching and tutorial activities associated with courses and seminars. Only four units of 195 may be used for satisfying the department major requirement.

198. Directed Group Study (2 or 4)
Directed group study in an area not presently covered by the departmental curriculum. (P/NP grades only.)

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

201. Politics, Political Science, and Political Theory (4)
An analysis of the intersections of political theory, political science, and politics. Readings will vary from year to year. Themes include liberalism and democracy, rights and interests, voting and representation, citizenship and equality. This course is required of all graduate students in political science. No prior work in political theory is presupposed. *Prerequisite: graduate standing or consent of instructor.*

202. Designing Political Research (4)
The theory and practice of research in political science. This course examines the major approach to the study of politics represented by significant works in the discipline. It considers how interesting and important questions are discovered and how research appropriate to them is designed and executed.

210A. Systems of Political Thought (I): Thucydides to Hobbes (4)
This course will review major texts and selected commentaries in the history of political thought as preparation for the field examination. Readings will include Thucydides, Plato, Aristotle, Augustine, Machiavelli, and Hobbes. *Prerequisite: graduate standing or consent of instructor.*

210B. Systems of Political Thought (II): Locke to Nietzsche (4)
This course will review major texts and selected commentaries in the history of political thought as preparation for the field examination. Readings will include Locke, Rousseau, Kant, Marx, Mill, and Nietzsche. *Prerequisite: graduate standing or consent of instructor.*

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.*

213A. Contemporary Political Theory (4)
This course focuses on theories and topics since the mid-nineteenth century. Among the themes to be discussed are authority, power, leadership, modernity, and post-modernity. Readings will include Nietzsche, Weber, Lenin, Freud, Oakeshott, Dewey, Focault, Walzer, and Rawls. *Prerequisite: graduate standing or consent of instructor.*

214. Marxist Political Philosophy (4)
An examination of selected texts in Marxist and post-Marxist political philosophy, with a focus on the theme of individual and collective identity including issues concerning alienation, consciousness, and ideology. *Prerequisite: graduate standing or consent of instructor.*

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.*

216. Radical Thought: Theologies of Liberation (4)
An examination of theologies of liberation combining Marxist social critiques with Christian Theological perspectives. The course will compare Augustinian theology and mainstream Roman Catholic social teachings with alternative Latin American, African, and feminist theologies embracing radical change in social structures. *Prerequisite: graduate standing or consent of instructor.*

217. Feminist Political Theory (4)
This course focuses on contemporary feminist political thought. Topics: theories of gender construction; relationship between gender and traditional political concepts; and debates about the social and political subordination of women. *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: PS 118A for 118B; graduate standing or consent of instructor for 218B.*

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.*

223A-B. Comparative Parliamentary Studies (4-4)
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.*

224. The Politics of Democratization (4)
This course will examine the following questions: Why do some countries fail and others succeed in establishing democracies? How do leaders "institutionalize" uncertainty? Should economic or political liberalization come first? Why are there periodic "waves" of democratic breakthrough and breakdown? *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 nondemocratic political systems. Readings draw from cases in Africa, Asia, Europe, and Latin America. *Prerequisite: graduate standing or consent of instructor.*

227. Marxism and National Development in East Asia (4)
A systematic consideration of the significance—positive and negative—of Marxism in the recent history of East Asia. Emphasis is placed on the role of Marxism as a conception of "modernity" and as a model of "development." *Prerequisite: graduate standing.*

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-B. The Mexican Political System (4-4)
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 political economy. Material to be drawn from literatures in anthropology, economics, history (twentieth century), political science, sociology, urban studies, and communications. Topics vary from year to year, partly reflecting research interests of participating students. Students are expected to write substantial research papers or thesis proposals, in consultation with instructor, home department advisers, and visiting scholars in residence at the Center for U.S.-Mexican Studies. *Prerequisite: graduate standing or consent of instructor.*

231. Soviet Politics (4)
A colloquium surveying the major controversies in Sovietology. *Prerequisite: graduate standing or consent of instructor.*

232. The Chinese Political System (4)
The evolution of political institutions and processes in the People's Republic of China. The course will examine the changing roles of the leader, the Communist Party, the government, the army; the shifting authority relations between central and local governments; and changing patterns of citizen behavior. *Prerequisite: graduate standing or consent of instructor.*

233. Politics and Political Economy in Contemporary Japan (4)
Japanese politics in theoretical and comparative perspective. Topics covered may vary from year to year, and include the dynamics of the party system, the influence of international economic integration on policy making and the nature and evolution of democracy in Japan. *Prerequisite: graduate standing or consent of instructor.*

234. Politics, Economics, and Socialism (4)
This course examines how economic structures and behavior affect political institutions and how political institutions and actions affect economic structures and behavior in socialist countries. Focus primarily on socialist/communist states, but reference will be made to communist parties and the dynamics of the public sector in nonsocialist countries as well. *Prerequisite: graduate standing.*

235A. Latin American Politics (4)
(Conjoined with IP/Gen 477 and IP 277.) 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 the emergence of middle-level powers. *Prerequisite: graduate standing or consent of instructor.*

235B. Regime Transformation in Latin America (4)
This seminar will focus on processes of regime transformation in Latin America, with particular emphasis on recent patterns of democratization. The goals will be to explore the current literature, to examine its theoretical foundations, to identify unresolved questions, and to frame topics for further research. *Prerequisite: graduate standing or consent of instructor.*

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.

237. Grassroots Organizations and Political Change (4)
Comparative studies of subnational political organizations and their capacity for effecting political change and influencing public policy. Topics may include new social movements, trade unions, peasant movements, politicized church groups, urban neighborhood organizations, and women's groups. Organized around case studies and competing theoretical approaches. Cases will vary and emphasize contemporary Latin America. *Prerequisite: graduate standing.*

238. The Political Development of Modern Japan (4)
(Conjoined with IP/Gen 489 and IP/Gen 289) This course seeks to illuminate issues in contemporary Japanese politics by examining Japan's politico-economic development since the Meiji era. Particular stress is placed on issues concerning modernity and national identity and the significance of the role of Japan's developmental state. *Prerequisite: graduate standing or consent of instructor.*

241. Theory of International Relations: International System (4)
(Crosslisted with IR/Gen 200) This course examines the concepts of international structure and system in the field of international relations. It covers the literature on realism, neorealism, world systems theory, and other system-level explanations of patterns of international conflict and cooperation, continuity, and change. *Prerequisite: graduate standing or consent of instructor.*

242. Theory of International Relations: The Unit in the International System (4)
(Crosslisted with IP/Gen 201) This course reviews the literature on the role of states and other actors in the international system. Issues to be discussed include: the domestic sources of foreign policy, and the degree to which changes in the characteristics of the units of a system can change the system itself. *Prerequisite: graduate standing.*

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.*

244. Models of International Change (4)
The seminar will explore models that account for international change by linking international (systemic or structural) and domestic variables. Particular attention will be given to evolutionary and learning models as they have been employed in a number of disciplines. *Prerequisites: MPIA students—IP/Core 410; Ph.D. students—no prerequisites.*

248. Special Topics in International Relations (4)
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.*

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.*

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.*

260. Political Economy: Institutional Change (4)
This advanced seminar will focus on attempts to use economic theory in comparative and American politics. The micro foundations of macro models will be stressed. *Prerequisite: graduate standing or consent of instructor.*

260AA. Policy Analysis (4)
This course reviews the process involved in converting the preferences of individuals into public policy as well as the methods and tools used by analysts and policy makers. *Prerequisite: graduate standing.*

260AB. Introduction to Policy Analysis (4)
This course will emphasize the political and organizational problems of designing and implementing public policies. Students will attend lectures and carry out research and writing assignments designed for graduate students.

262. Political Dimensions of International Finance (4)
Examination of effects of national policies and international collaboration of public and private international financial institutions, in particular management of international debt crises, economic policy coordination, and the role of international lender of last resort. *Prerequisite: graduate standing.*

269. Special Topics in Political Economy (4)
This seminar is an examination of the different approaches to the study of political economy. Issues and research areas will vary each time the course is offered. *Prerequisite: graduate standing or consent of instructor.*

270A. Quantitative Methods in Political Science (4)
This is a reading and discussion seminar for graduate students in political science and other social science disciplines. Its purpose is to acquaint participants with some basic trends in quantitative research and to exercise critical faculties. An analytical critique of approximately 10–12 pages will be required. *Prerequisite: graduate standing in any discipline in the social sciences or humanities or consent of instructor.*

271A-B. Advanced Statistical Applications (4-4)
Use of advanced quantitative techniques in political science. Students will use political science data to complete small exercises and a major project. *Prerequisites: PS 270A for 271A, 271A for 271B.*

272. Historical Methods in Political Science (4)
This seminar explores various methodologies employed in the historical study of politics. It focuses upon specific substantive controversies, e.g., the changing nature of electoral politics, political recruitment and careers, social mobility, and acquaints students with appropriate methodologies and statistical techniques.

273. Game Theory and Political Applications (4)
Introduction to the use of formal models in political science including game theory and social choice theory. Course will provide preparation for the field examination.

274. Axiomatic Social Choice Theory (4)
An introduction to some of the central issues in the axiomatic approach to social choice initiated by Arrow's Social Choice and Individual Values. Because of the many complexities that underly an analysis of social choice, the course will be quite technical in nature. *Prerequisite: PS 250 or consent of instructor.*

281A-B-C. Workshop on Political Institutions (4-4-4)
Examination of recent research in American politics and comparative politics concerning political institutions; 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.*

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.*

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.*

291B. Research Tutorial in Comparative Politics (4)
Tutorial in a selected area of comparative politics leading to a research paper. The content of each tutorial will be determined by the professor. *Prerequisite: graduate standing in political science.*

291C. Research Tutorial in International Relations (4)
Tutorial in a selected area of international relations 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.*

292. Directed Reading in Comparative Politics (4)
Directed reading in a selected area of comparative politics for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's faculty adviser.

293. Directed Reading in International Relations (4)
Directed reading in a selected area of international relations for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's faculty adviser.

295. Directed Reading in American Politics (4)
Directed reading in a selected area of American politics for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's faculty adviser.

296. Directed Reading in Political Theory (4)
Directed reading in a selected area of political theory for graduate students. The content of each reading course is to be decided by the professor directing the course with the approval of the graduate student's faculty adviser.

298. Directed Reading (1-12)
Guided and supervised reading in the literature of the several fields of political science.

299. Independent 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.

Psychology

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Stuart M. Anstis, Ph.D.
Mark I. Appelbaum, Ph.D.
Richard C. Atkinson, Ph.D., *UC President*
Elizabeth A. Bates, Ph.D.
Ursula Bellugi, Ph.D., *Adjunct*
Robert M. Boynton, Ph.D., *Emeritus*
Michael Cole, Ph.D.
Francis H. C. Crick, Ph.D., *Adjunct*
Diana Deutsch, Ph.D.
J. Anthony Deutsch, D. Phil, *Emeritus*
Ebbe B. Ebbesen, Ph.D.
Edmund J. Fantino, Ph.D.
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*
William J. McGill, Ph.D., *Adjunct*
Harold E. Pashler, Ph.D.
John M. Polich, Ph.D., *Adjunct*
Vilayanur S. Ramachandran, Ph.D., M.B.B.S.
Laura E. Schreibman, Ph.D.
Cheryl L. Spinweber, Ph.D., *Adjunct*
Joan Stiles, Ph.D.
Larry R. Squire, Ph.D., *In Residence*
David A. Swinney, Ph.D., *Chair*
Paul E. Touchette, Ph.D., *Adjunct*
Ben A. Williams, Ph.D.

Associate Professors

Brett A. Clementz, Ph.D.
John T. Wixted, Ph.D.

Assistant Professors

Nicholas Christenfeld, Ph.D.
Karen R. Dobkins, Ph.D.
Kimberly A. Jameson, Ph.D.
Shirley McGuire, Ph.D.
Craig R. M. McKenzie, Ph.D.

Affiliated Faculty

Philip M. Groves, Ph.D., *Professor of Psychiatry*
Steven A. Hillyard, Ph.D., *Professor of Neurosciences*
Jean M. Mandler, Ph.D., *Professor of Cognitive Science*
Pamela A. Sample, Ph.D., *Associate Professor in Residence, Ophthalmology*
David S. Segal, Ph.D., *Professor of Psychiatry*
Terrence J. Sejnowski, Ph.D., *Professor of Biology and Adjunct Professor of Physics*

The Undergraduate Program

The Psychology Major Program

The department offers courses in all major areas of experimental psychology, with empha-

sis in the areas of behavior analysis, cognitive psychology and human information processing, developmental psychology, physiological psychology, 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.

Prerequisites for Psychology Majors

Experimental psychology uses the tools and knowledge of science: calculus, probability theory, computer science, chemistry, biology, statistics, and physics. 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 general introductory courses to the natural sciences, i.e., biology, chemistry, and physics.The following is a list of acceptable natural science courses offered at UCSD:

   Biology: 1, 2, 3, 10, 12, 20, 24, 26, 30

   Chemistry: 4, 6A, 6B, 6C, 11, 12, 13

   Physics: Any of the 1 and 2 series, 10, 11A
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 1A-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 5A, CSE 5B, CSE 10, AMES 5, AMES 10, or equivalent. 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, Social Science 60, Mathematics 181, BIEB 100, or equivalent. Statistics has to be taken for a letter grade.

Students should complete these prerequisite requirements by the end of the sophomore year.

Major Requirements

A minimum of **twelve** upper-division courses in psychology are 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 grade; courses taken on a Pass/No Pass basis prior to declaring psychology as a major **cannot** be used to satisfy the major requirement. Excluded from credit toward the major are Psychology 199 (Special Studies), Psychology 197 (Internship), and graduate research seminars (usually designated as "Special Topics in . . ."); 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.

For the convenience of students who wish to focus on a particular area in experimental psychology the following lists by area might be of assistance. Detailed course descriptions and prerequisites will follow. For further information students should contact a faculty adviser.

Behavior Analysis

Behavior Analysis is the study of learning based on the principles of Pavlovian and operant conditioning and other aspects of contemporary associative learning theory. It also includes application of reinforcement principles and other behavior modification techniques in applied settings:

103 Principles of Behavior
120 Learning and Motivation
121 Lab/Operant Psychology
143 Control and Analysis of Human Behavior
146 Theory of Conditioning and Learning
154 Behavior Modification
168 Psychological Disorders of Childhood
184 Choice and Self Control

Cognitive Psychology

Cognitive Psychology includes the study of attention, memory, thinking, language, judgment and decision making, mental chronometry, and visual and auditory information processing.

105 Cognitive Psychology
112 Applied Cognitive Research Lab
113 Seminar in Applied Cognitive Research
115 Lab/Cognitive Psychology
118 Real-Time Examination of Language Processing
119 Psycholinguistics/Cognition Laboratory
129 Logic of Perception
136 Cognitive Development
145 Psychology of Language
148 Psychology of Judgment and Decision
156 Cognitive Development in Infancy
174 Communication Disorders in Children and Adults

Developmental Psychology

Developmental Psychology is the study of all aspects of human development, with emphasis on cognitive development, perceptual development, and language acquisition, early brain damage and developmental disabilities.

101 Developmental Psychology
105 Cognitive Psychology
114 Lab/Developmental Psycholinguistics
117 Lab/Developmental Psychology
122 Aging
128 Practicum in Child Development
133 Brain and Cognitive Development
136 Cognitive Development
145 Psychology of Language
156 Cognitive Development in Infancy
167 Social and Emotional Development
168 Psychological Disorder of Childhood
174 Communication Disorders in Children and Adults
180 Adolescence

Physiological Psychology

Physiological Psychology is the study of how the nervous system mediates behavioral effects in the realms of motivation, perception, learning and memory, and attention. Also includes human neurophysiology and aphsia.

106 Physiological Psychology
129 Logic of Perception
137 Sleep and Dreaming
152 Brain Waves and Thoughts Processes
159 Physiological Basis of Perception
176 Functional Neuroanatomy

179 Drugs, Addiction, and Mental Disorders
181 Drugs and Behavior

Sensation and Perception

Sensation and Perception is the study of sensory systems and perception, which encompasses mechanisms of sensory receptors, nervous transmission, and brain mechanisms. It also includes the bahavioral study of psycho-physics and higher-order perceptual effects such as visual and auditory illusions and music perception.

102 Intro to Sensation and Perception
129 Logic of Perception
138 Sound and Music Perception
159 Physiological Basis of Perception
169 Brain Damage and Mental Functions

Social Psychology

Social Psychology is the study of 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.

104 Introduction to Social Psychology
127 Applied Social Psychology
130 Delay of Gratification
149 Social Psychology of Theater
155 Social Psychology and Medicine
160 Groups
162 Psychology and the Law
167 Social and Emotional Development
175 Psychology and the Arts
178 Organizational Psychology
185 Communication: Nonverbal and Disfluent
186 Psychology and Social Policy

Clinical Psychology

Clinical Psychology includes concepts, skills, and theoretical perspectives used by psychologists to help people in distress.

131 Personality: Theory and Research
137 Sleep and Dreaming
150 Advanced Abnormal Psychology
151 Test and Measurement
153 Clinical Psychology
154 Behavior Modification
163 Abnormal Psychology
168 Psychological Disorders of Childhood

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(s) (Psychology 114, 115, 117, 118, 119, 121, 127)
3. Introduction to Statistics and Advanced Statistics (Psychology 60 and 111A and B)
4. The Senior Independent Research Project, Psychology 194A-B-C, as part of the Honors Program.

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.

Honors Program

Students are encouraged to participate in the department's honors program. Prerequisite is an overall GPA of 3.3. Admission is granted by application in the fall of the junior year (deadline October 31). This program is composed of the following courses which are part of the general requirements:

1. Junior year: W: Junior Honors Research Seminar 110

   Winter & Spring: Advanced Statistics and Research Methods 111A+B
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.

During this period of five courses:

3. At least one laboratory course (Psychology 112, 114, 115, 117, 118, 119, 121, 127) or, upon petitioning, two Psychology 199 Independent Study culminating in a paper (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.

The honors program is strongly recommended for all students interested in graduate schools.

The Minor Program

All five colleges offer a **minor** program with differing requirements. Students are encouraged to see the respective college advisers for pertinent details.

The minor normally consists of six courses of which at least three courses have to be upper-division. At least three courses have to be taken at UCSD. Students are free to enroll in any psychology courses as long as they fulfill possible prerequisites. For grading options, please contact your provost's office. For the department a P grade is acceptable—EXCEPT for Psychology 60 (Statistics), which **must** be taken for a letter grade. For your convenience, we list possible areas of concentration:

Behavior Analysis:

(1, 4, 60), 102, 120, 121, 143, 146, 154, 168, 184

Clinical Psychology:

131, 137, 150, 151, 153, 154, 163

Cognitive Psychology:

(1, 3, 10, 60), 102, 105, 111, 115, 118, 119, 136, 145, 174

Developmental Psychology:

(1, 3, 60), 101, 105, 114, 117, 122, 133, 136, 156, 168, 174, 180

General Psychology:

(1, 2, 3, 4, 60), 101, 102, 103, 104, 105, 166

Physiological Psychology:

(1, 2, 60), 102, 106, 176, 179, 181

Sensation and Perception:

(1, 2, 60), 102, 105, 129, 138, 159, 169

Social Psychology:

(1, 2, 4, 6, 60), 104, 127, 130, 149, 155, 160, 162, 175, 178, 185, 186

(Detailed course descriptions are listed at the end of the section on psychology).

Transfer Credit

In general, all introductory courses in scientific and 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) they had a general introductory course as a prerequisite, and 2) the student had satisfied this prerequisite before taking the special topics course. Upper-division psychology courses will be evaluated for transfer credit on a course by course basis.

Elementary School Teaching

A psychology 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 as early as possible in your academic career for information about the prerequisite and professional preparation requirements.

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 psychology (including attention and language), developmental psychology (including language acquisition), sensation and perception (including vision and audition), and social psychology (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 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 project completed as part of a research practicum. 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, third edition, 1983, 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.)

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 completion of all department requirements, satisfactory completion of the first-year research project (including the oral presentation), a B+ average in the quantitative methods courses, and a B+ average in other course work.

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.

Qualifying Examination for the Ph.D. Degree

The qualifying examination is divided into two sections to be taken separately by all stu-

dents. *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 page) 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

Each student is required to participate in the teaching activities of the department. Students are required to serve as teaching assistants for one quarter during their first year in the program and for two quarters during years two through four.

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 student 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 receive 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.

Psychology majors must all learn experimental methods, including basic statistical techniques. Those in the honors program must take laboratory courses and also do a year-long undergraduate thesis.

LOWER-DIVISION STUDENTS

Students enrolled in the lower-division courses must serve as experimental subjects for participation in 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 will usually 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.

5. Introduction to Abnormal Psychology (4)
Introduction to the major theoretical orientations, important psychotherapeutic methods, selected disorders including anxiety, depression, schizophrenia, and psychosomatic disorders, and current issues in abnormal psychology.

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.

7. General Psychology: Developmental Psychology (4)
This course is an introduction to the cognitive and social changes that take place over the course of a lifetime. This course introduces influential theories of child development, such as those of Freud and Piaget, together with recent criticisms of these theories.

8. Psychopharmacology: Everyday Addiction (4)
This course explores the defining characteristics, etiology, prevention, and treatment of excessive consummatory behaviors knows as addictions in our daily lives, including those motivated by legal drugs (caffeine, nicotine, and alcohol), foods including junk food, and other appetites such as sex, gambling, and even exercise.

9. Brain Damage and the Mind (4)
Issues to be covered include whether cognitive functions are localized or diffusely represented in the brain, the brain mechanisms of perception, memory, speech, thought, and movement, and the effects of damage to individual parts of the brain.

10. Cognition and Perception: Applied Aspects (4)
An introduction to cognitive and perceptual psychology as applied to real-world concerns, and the research issues that are important for the ultimate applicability of psychological findings. Topics covered will include gender differences in cognitive processing, sensory processing, memory and its distortions, pragmatic use of language and information processing, and cross-cultural universals.

60. Introduction to Statistics (4)
Introduction to the experimental method in psychology and to mathematical techniques necessary for experimental research. *Prerequisite: one year of mathematics or consent of instructor.*

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 perceptual and cognitive processes. *Prerequisite: Psychology 60 or one year of college-level mathematics.*

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.

110. Junior Honors Research Seminar (4)
Bi-weekly meetings consist of research seminars by a range of departmental faculty, exposing students to contemporary research problems in all branches of experimental psychology. Evaluation is based on assigned papers. *Prerequisite: admission by application in the fall of the Junior year*, with a minimum UCSD GPA of 3.3.* Course is offered in winter quarter.

*Application forms are available from the Student Services Office and due by the end of October of each fall quarter.

111A. Research Methods I (4)
This course is designed to provide training in the applications of advanced statistical methods and in the context of initial instruction in experimental design. Emphasis will be placed on the development of statistical problem-solving skills and practical applications. *Prerequisites: minimum grade of B in either Psychology 60 or equivalent and junior standing. Open to honors students or consent of instructor.*

111B. Research Methods II (4)
This course is designed to extend the material of Psychology 111A by focusing on the use of the techniques developed previously on several in-class experiments. Students will be required to participate in data collection, data organization, statistical analysis, and graphic displays. *Prerequisite: Psychology 111A or consent of instructor.*

112. Applied Cognitive Research Lab (4)
This laboratory course involves empirical study of basic research issues in applied cognitive psychology, emphasizing both psychological theory and research applications. Students will be instructed in experimental design and method, data handling and analysis, and will actively participate in the implementation and completion of experimental studies. *Prerequisites: upper-division standing and consent of instructor.*

113. Seminar in Applied Cognitive Research (4)
This seminar involves instruction on basic research issues in applied cognitive psychology. Psychological theory and interdisciplinary methods will be illustrated through seminar readings and discussions of recent research publications. The emphasis will be on exploring interesting applied problems in psychology that are in need of empirical study. Students will be directed in developing research projects in a content domain of their interest. *Prerequisites: upper-division standing and consent of instructor.*

114. Laboratory in Developmental Psycholinguistics (4)
This course introduces the central issues and experimental measures of developmental psycholinguistics. Students conduct research with preschoolers to examine the acquisition of phonology, semantics, syntax, and pragmatics. *Prerequisites: Psychology 60 and 101.*

115. Laboratory in Cognitive Psychology (4)
Lecture and laboratory work in human information processing. *Prerequisites: Psychology 105 and 111 or consent of the instructor.*

117. Laboratory in Developmental Psychology (4)
The laboratory course in developmental psychology is designed around a series of intensive observational assignments, and one experimental project. Each observational assignment will include a lecture providing background on a major area in child development, a supervised structured observation, and a written laboratory report. *Prerequisite: Psychology 101.*

118. Real-Time Examination of Language Processing (4)
This lab 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. *Prerequisites: A course in language or cognition (see professor for exceptions). Permission of instructor required. Department stamp required.*

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 118 (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. *Prerequisite: upper-division standing.*

121. Laboratory in Operant Psychology (4)
Lecture and laboratory in operant psychology. *Prerequisite: must be taken with Psychology 120.*

122. Aging (4)
An introduction to the psychology of aging (from age 20 on). This course is designed to extend the developmental course (101) which focuses primarily on early development. Lectures cover a variety of topics including behavioral (functional changes), physiological changes (mainly associated with the central nervous system), and neuropathological disorders associated with aging. *Prerequisites: Psychology 60 and 101.*

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 (4)
This course is intended as a combined lecture and laboratory course for seniors in psychology and communication. Their backgrounds should consist of a solid background in general psychology or communication and human information processing. The course will meet for two hours a week of lectures and discussion. Students will be expected to spend four hours a week of supervised, practical experience in a field setting involving children. An additional six hours of student time will be devoted to reading, transcribing field notes, and writing a paper on some aspect of the fieldwork experience as it relates to class lectures and readings. Evaluation of the course will be based on performance in classroom discussion, the judged quality of the students' fieldwork, and the quality of their term papers. *Prerequisites: Com/Gen 20 and Com/HIP 100, or a background in general psychology; upper-division standing or consent of instructor.*

129. The Logic of Perception (4)
This course is concerned with how we perceive the world. The lectures will cover three topics: a) the rich tradition of experimental work on perception that dates back to Helmholtz, b) discussion and criticisms of theories of perception including the view that perception is "intelligent" or "logical", c) 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. 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. *Prerequisite: upper-division standing.*

131. Personality Theory and Research (4)
This course serves as an introduction to major theoretical approaches to the study of personality constructs and processes. Research advances in personality will be reviewed, and 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.*

133. Brain and Cognitive Development (4)
This course will review human brain development from early gestation through adolescence, and consider relations between neurological development and behavioral milestones. The effects of early brain injury on the development of both the neural and cognitive systems is considered. *Prerequisite: upper-division standing; Psychology 176 strongly recommended.*

136. Cognitive Development (4)
An examination of 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. *Prerequisite: Cognitive Science 101B or Psychology 105 or Psychology 101.*

137. Sleep and Dreaming (4)
Psychological and physiological aspects of the human sleep/wake cycle and dreaming, including EEGs, drug effects, circadian rhythms, sleep disorders, and dream interpretation. *Prerequisite: upper-division standing.*

138. Sound and Music Perception (4)
Topics include the physiology of the auditory system, perception of 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.*

141. Evolution and Human Nature (4)
This course will examine the question of whether important aspects of human behavior can be explained as a result of natural selection. The focus will be on sex differences, selfishness and altruism, homicide and violence, and context effects on human reasoning. *Prerequisites: upper-division standing and consent of instructor.*

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 psychology majors.*

145. Psychology of Language (4)
Examination of theory and research on language comprehension and production. Focus on brain bases 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.*

146. Theories of Conditioning and Learning (4)
Primary emphasis will be on contemporary theoretical accounts of learning, based on research on Pavlovian and Instrumental Conditioning. *Prerequisite: Psychology 103 or equivalent.*

147. Psychology of Student Protest (4)
Course examines psychological factors operative in student protest movements of the 1960s, as distinct from political explanations commonly advanced. Among the forces considered: counterculture and alienation, frustration-aggression, oedipal mechanisms, situational stress, peer group pressures. *Prerequisite: upper-division standing.*

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. *Prerequisites: Psychology 104 and 105.*

149. Social Psychology of Theatre (4)
This undergraduate seminar will explore the relationship between social psychology and drama, focusing especially on the use of psychological principles in plays (by playwrights) and their performance (by directors, actors, and choreographers). In addition to discussions and student presentations based on assigned readings, there will be videotaping sessions of students' scenework. *Prerequisites: upper-division standing; psychology major, theatre major, or permission of instructor.*

150. Advanced Abnormal Psychology (4)
In-depth study of selected psychopathological disorders (e.g., schizophrenia, affective disorders, personality disorders). Topics for discussion will change yearly. Students will gain an understanding of current theoretical research issues in psychopathology. The development of an independent research project will be required. *Prerequisites: A or B in Psychology 163 and consent of instructor.*

151. Test 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. Brainwaves and Thought Processes (4)
The relationships between human cognition and neural activity in terms of event-related brain potentials (ERPs) will be discussed. *Prerequisite: Psychology 105.*

153. Clinical Psychology (4)
Topics to be covered include the major theoretical orientations in clinical psychology and the major types of psychotherapy (behavior modification, individual or group psychotherapy, play therapy, hypnosis, biofeedback and art therapy), legal and ethical issues involved in clinical practice. *Prerequisite: upper-division standing.*

154. Behavior Modification (4)
Extension of learning principles to human behavior. In addition to discussion of the broad implications of a behavioral perspective, topics include methods of applied behavior analysis and applications of behavioral principles to clinical disorders and to normal behavior in various settings. *Prerequisites: Psychology 103 and/or Psychology 120.*

155. Social Psychology and Medicine (4)
Explores areas of health, illness, treatment, and delivery of treatment that may be elucidated by an understanding of psychological concepts and research and considers how the psychological perspective might be enlarged and extended in the medical area. *Prerequisites: Psychology 60 or equivalent and Psychology 104.*

156. Cognitive Development in Infancy (4)
This course examines perception and cognition in the first year of life. The focus is a critical evaluation of different theories of cognitive change in infancy. Methodological issues will be a central concern. *Prerequisites: Psychology 60 and 101.*

159. Physiological Basis of Perception (4)
A survey of sensory and perceptual phenomena with emphasis on the physiological mechanisms underlying them. *Prerequisite: Psychology 102 or consent of instructor.*

160. Groups (4)
What are the causes and consequences of our gregariousness? 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 influences. *Prerequisite: upper-division standing.*

162. Psychology and the Law (4)
Research dealing with psychological factors in the legal system will be surveyed. Particular emphasis will be placed on applying psychological theory and methods to the criminal justice system in an attempt to understand the behavior of its participants. *Prerequisites: Psychology 60 and 104.*

163. Abnormal Psychology (4)
This course is a comprehensive survey of the origins, characteristics, and causes of abnormal behavior. Particular attention is given to the biological and environmental causes of abnormality.

166. History of Psychology (4)
Survey of the major trends and personalities in the development of psychological thought. Emphasis will be given to such selected topics as the mind-body problem, nativism vs. empiricism, and the genesis of behaviorism. *Prerequisites: three previous upper-division courses in psychology.*

167. Social and Emotional Development (4)
Lecture course focused on the early social development of the child. Will include topics like attachment, moral development, sex roles, self definition, and peer interaction. *Prerequisites: Psychology 60 and 101.*

168. Psychological Disorders of Childhood (4)
This course explores different forms of psychological deviance in children, including severe psychopathology, neurosis, mental retardation, language disorders, and other behavior problems. Emphasis is placed on symptomatology, assessment, etiological factors, and various treatment modalities. *Prerequisite: upper-division standing.*

169. Brain Damage and Mental Functions (4)
What are the 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 functions of the normal brain by studying patients? *Prerequisite: upper-division standing.*

174. Communication Disorders in Children and Adults (4)
This course will begin neural bases of language use in normal adults, and the neural bases of language and communication development in normal children. It will review recent evidence on the nature of language and communication deficits in several clinical populations of adults (especially aphasia and dementia) and children (including specific language impairment, focal brain injury, retardation, and autism). *Prerequisites: Cognitive Science 10A-B or Psychology 101 or Cognitive Science 101 A-B or Psychology 2 and 3.*

175. Psychology and the Arts (4)
This interdisciplinary course will discuss theoretical ideas and empirical research that relate contemporary psychology (social and cognitive, psychophysiology, motivation and emotion) to issues in various aesthetic and artistic domains, including the visual arts, music, literature, criticism, and the performance arts. *Prerequisites: upper-division standing; psychology major or music major or visual arts major or communications major or literature major or theatre major or permission of instructor.*

176. Functional Neuroanatomy (4)
Introduction to the structure of the nervous system. The course will focus on the anatomy of the human brain and the function of different brain regions. The alteration of normal brain produced by injury or disease will also be discussed. *Prerequisite: upper-division standing.*

177. Introduction to Behavioral Genetics (4)
Many factors contribute to determining how we think, feel, and act. This course will explore the role genetic factors play in determining important individual characteristics like intelligence, personality and certain forms of abnormal behavior (e.g., alcoholism, criminality, and schizophrenia). The course will be taught primarily through lecture and selected readings. *Prerequisite: upper-division standing.*

178. Organizational Psychology (4)
This course examines human behavior in industrial and organizational settings. Psychological principles are applied to selection, placement, and training. The effectiveness 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 Disorder (4)
This course will consider the use, abuse, liability, and psychotherapeutic effects of drugs in humans. Lectures are supplemented by guest lectures from clinical experts in psychology and psychiatry. *Prerequisite: one lower-division psychology course (Psychology 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 com-

bined with psychological, anthropological, and sociological considerations. *Prerequisite: Psychology 60.*

181. Drugs and Behavior (4)
Psychological effects, brain mode of action, patterns of use of psychoactive agents, including stimulants, sedative/hypnotics, hallucinogens, marijuana, alcohol, over-the-counter drugs, cognitive enhancers, antianxiety agents, antidepressants, and antipsychotics. This course develops basic principles in psychopharmacology while exploring the behavioral effects of drugs and mechanisms of action of drugs. *Prerequisite: junior standing.*

184. Choice and Self Control (4)
This course is an overview of the experimental analysis of choice behavior, with an emphasis on the types of choice involved in self-control. A central interest will be the conditions under which decision-making is optimal. *Prerequisite: upper-division students majoring in psychology, biology, or economics; or consent of instructor.*

185. Communication: Nonverbal and Disfluent (4)
This course will focus on nonverbal behaviors (gestures, facial expressions as well as pulse, skin conductance, and the like) and on speech disfluencies (ums, stutters, etc.) and what they can tell us about communication. *Prerequisite: upper-division standing.*

186. Psychology and Social Policy (4)
This course will examine a number of 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. *Prerequisites: Psychology 60 and 104.*

194A-B-C. Honors Thesis (4-4-4)
Weekly research seminar, three-quarter research project under faculty guidance which culminates in senior honors thesis. *Prerequisites: one laboratory course in psychology (Psychology 114 through 127), Psychology 111A and B, and 110, a 3.3 grade-point average, and consent of instructor.*

195. Instruction in Psychology (4)
Introduction to teaching of introductory psychology. Each student will be responsible for and teach a class section in one of the lower-division psychology courses. (P/NP grades only.) Limited to seniors majoring in psychology with consent of instructor. Students will attend the lectures of the lower-division course, meet once a week with a class section and for one hour a week with the instructor. *Prerequisites: junior standing and either a) an A in the course in which the student plans to assist, or b) a grade-point average of B or better in no fewer than three upper-division psychology courses. Consent of instructor. Only counts once toward minor or major.*

198. Directed Group Study in Psychology (2)
Group study under the direction of a faculty member in the Department of Psychology. ***Prerequisites: Psychology 101, 102, 103, or 105.***

199. Independent Study (2-4)
Independent study or research under direction of a member of the staff. Not counted for credit towards the major. (P/NP grades only.) *Prerequisite: special permission of department.*

GRADUATE

201A-B. Quanititative Methods in Psychology (3-3)
An intensive course in statistical methods and the mathematical treatment of data, with special reference to research in psychology. *Prequisite: restricted to graduate students in psychology.*

207. Principles of Behavior (3)
Basic seminar on behavior theory with emphasis on principles of conditioning as the foundation of a general model of behavior.

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.)

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.*

215. Language Acquisition (4)
Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to non-linguistic development. *Prerequisite: consent of instructor.*

216. Basic Seminar in Comparative Cognitive Research (3)
This seminar will review current research and theory in cognitive psychology, in order to characterize group differences in cognitive functioning. Groups chosen are assumed to be not equivalent in theoretically important ways that affect their performance on standard laboratory tasks.

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 Psycholgy (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 those 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 212A or special consent of instructor.*

224. Experimental Analysis (3)
Graduate course aimed at practical problems of experimental analysis and substantive interpretation of data.

225. The Development of Speech Perception (3)
This seminar will deal with selected topics concerning how infants, young children, and adults analyze speech and how speech perception changes with development.

227. Cognitive Development (4)
Selected topics with emphasis on current experimental work. *Prerequisite: consent of instructor.*

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.

230. Brain, Cognition, and Development (3)
This course focuses on issues related to early brain and cognitive development, with emphasis on early plasticity and lateralization of function. The course is designed for students in cognitive development with interest in cross-disciplinary issues.

231. Auditory Perception (3)
This course will give a comprehensive overview of auditory perception. Topics will include: the nature of sound, the ear, auditory pathways in the brain, perceptual images of sound, grouping mechanisms in sound perception, perception of music, and developmental studies of sound perception.

233A-B. Topics in Learning and Motivation (3-3)
Advanced topics in learning and motivation, with special emphasis on current research. *Prerequisite: Psychology 210.*

234. Animal and Human Memory (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.

235. Cognitive Psychophysiology (3)
This seminar will survey the literature on psychophysiological studies of cognitive processes. The emphasis will be on work using event-related brain potentials to study psychological processes underlying perception, thought, or action. *Prerequisite: consent of instructor.*

237. Modern Research in Visual Perception (3)
This seminar will cover topics related to visual perception. Current research on vision, sensation, and perception will be discussed.

238. Seminar on Visual Information Processing (3)
The course will focus on experimental studies of higher level visual processing, emphasizing research on visual memory systems and on the functional locus of attentional selectivity in vision. Current work on picture and scene perception will be reviewed. The relationship between visual processes and spatial representation will also be reviewed.

239. Self-Deception: Theories and Evidence (3)
This seminar will cover recent analyses of the problem of self-deception from various approaches, including the following: experimental cognitive and social-psychological studies, philosophical analyses of self-deception and analyses of self-deception from the viewpoint of decision theory, evolutionary theory, and sociobiology.

240. Seminar on Human Memory (3)
The seminar will deal with current theory and experimental research on basic processes in human memory.

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 instructor.*

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.

246. Learning Theory (3)
Material will include modern developments in learning theory, based primarily on research with animal subjects. *Prerequisite: consent of instructor.*

247. The Psychology of Movement and Action (3)
This seminar will survey literature on the cognitive processes underlying movement and action. Although the focus will be on psychology, some relevant literature from philosophy and neuroscience will also be discussed. *Prerequisite: graduate standing or consent of instructor.*

248. Psychology and the Law (3)
This seminar surveys topics in psychology and the law. Emphasis will be on both applied and basic issues.

249A-B-C. Advanced Topics in Applied Behavior Analysis (3-3-3)
Research and discussion on selected topics in applied behavior analysis.

250. Selected Topics in Psychopathology (3)
Discussion of research on the major forms of psychopathology (e.g., schizophrenia, affective disorders, personality disorders) Topics will change yearly. The major emphases will be (1) understanding theories of etiology and symptom manifestation; and (2) evaluating research which bears on those theories. *Prerequisite: consent of instructor.*

251. Advanced Topics in Learning and Motivation (3)
Weekly meetings for graduate students actively engaged in research on conditioning. *Prerequisite: consent of instructor.*

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.

255. Advanced Topics in Physiological Psychology (3)
Research and discussion on selected topics in physiological psychology. *Prerequisites: consent of instructor. Open to undergraduates with consent of instructor.*

256. Advanced Topics in Developmental Psychology (3)
Research and discussion on selected topics in developmental psychology. *Prerequisites: consent of instructor.*

257. Communication: Nonverbal and Disfluent (3)
This course will focus on nonverbal behaviors and on speech disfluencies and what they can tell us about communication.

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.

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. Topics in the History of Psychology (3)
The seminar will cover the development of concepts and methods in psychology, particularly during the nineteenth and twentieth centuries. Particular emphasis will be placed on the precursors of currently active areas of research and theory and on the historical and social contexts for these developments. *Prerequisite: completion of first year of graduate work in psychology or consent of instructor.*

262. Emotion: Theories and Evidence (3)
A critical examination of current theories of human emotion from the point of view of contemporary cognitive psychology. Discussion of behavior and physiological research in the light of different theoretical positions. *Prerequisite: second-year graduate standing in psychology or consent of instructor.*

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.

265. Psychology and Medicine (3)
Concentrates on what psychology has to contribute to the understanding of illness, its treatment, and the social context in which these processes occur. Topics: Psychological factors in the etiology and treatment of illness, doctor-patient roles, and communication. *Prerequisites: open to undergraduates with Psychology 126 or Psychology 127 and consent of instructor.*

266. Advanced Topics in Psycholinguistics (3)
This course will include evaluation and discussion of current research on selected topics in language processing and in aphasia.

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 and Music Perception (3-3-3)
Research and discussion on selected topics in sound and music perception.

270A-B-C. Introduction to Laboratory Experimentation (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.*

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 Policy Analysis Minor

OFFICE: 1512 Galbraith Hall, Revelle College

Affiliated Faculty

AMES
Massoud T. Simnad, Ph.D.

ANTHROPOLOGY
Shirley C. Strum, Ph.D.

ucsd

BIOLOGY
Michael E. Gilpin, Ph.D.
David S. Woodruff, Ph.D.

CHEMISTRY
Mark H. Thiemens, Ph.D.

COMMUNICATION
Philip Agre, Ph.D.
Francois Bar, Ph.D.
William J. Drake, Ph.D.
Daniel C. Hallin, Ph.D.
Robert B. Horwitz, Ph.D.

ECONOMICS
Julian Betts, Ph.D.
Richard T. Carson, Ph.D.
Marjorie Flavin, Ph.D.
Theodore Groves, Ph.D.
Walter P. Heller, Ph.D.
Valerie A. Ramey, Ph.D.
James E. Rauch, Ph.D.
Ross M. Starr, Ph.D.

IR/PS
Gordan MacDonald, Ph.D.

MATHEMATICS
Ian S. Abramson, Ph.D.

POLITICAL SCIENCE
Nathaniel L. Beck, Ph.D.
Amy Bridges, Ph.D.
Gary W. Cox, Ph.D.
Steven P. Erie, Ph.D.
Gary C. Jacobson, Ph.D.
Samuel H. Kernell, Ph.D.
Arthur Lupia, Ph.D.
Mathew D. McCubbins, Ph.D.
Samuel L. Popkin, Ph.D.

SIO
Duncan Agnew, Ph.D.
David M. Checkley, Ph.D.
Paul K. Dayton, Ph.D.
Richard B. Deriso, Ph.D.
Lisa A. Levin, Ph.D.
Jean-Bernard H. Minster, Ph.D.
Michael L. Mullin, Ph.D.
V. Ramanathan, Ph.D.
George Sugihara, Ph.D.
Martin Wahlen, Ph.D.

SOCIOLOGY
Lisa Catanzarite, Ph.D.
Hugh B. Mehan, Ph.D.
David P. Phillips, Ph.D.
Akos Rona-Tas, Ph.D.
Carlos Waisman, Ph.D.
Kathryn A. Woolard, Ph.D.

There is a great need for policy analysis of science and technology issues. The value of such analysis is greater than ever at a time of significant long-term budget cuts in programs supporting basic research. Are these budget cuts justifiable? If not, how large are economic, scientific, and political damages to the nation, to California, and to San Diego? How can one best determine which research programs have the highest priority?

The important and novel element in the minor is the emphasis on Science and Technology policy as the unifying theme. In this respect, the policy minor is unique in the United States, so far as is known, and it is designed to appeal to students interested in the natural sciences. For example, students who are interested in policy problems of the atmosphere, ecology, energy, the environment, or the ocean would find a useful and appealing sequence of courses in the minor.

The minor is also appealing and valuable for students in the social sciences who want an analytically-based concentration in areas of public policy. In addition to those above, examples include communications policy and population policy. Political science students with an interest in economic policy and economics students with an interest in political economy would also find a home here.

The public policy minor provides students with many of the necessary analytical skills and the institutional background for the understanding of how public policy is made and how it should be made. Research and teaching in the ways of government and the methods of policy evaluation enriches our understanding of national, state, and local policy issue. It also leads to more effective government, as students and professors go on to provide governments with greater expertise.

The Minor Program

There are numerous policy courses are taught in a variety of departments, and these are now drawn together. Accordingly, faculty from biology, chemistry, communication, economics, engineering, IR/PS, political science, SIO, sociology, and others teach in the program.

The program consists of statistics prerequisites, core courses and policy-oriented elective courses. These courses are offered in the departments listed above. The primary goal of the prerequisite courses is to develop a solid analytical base for the minor. These courses consist of two quarters of statistics. The upper-division core sequence is a two-quarter course in policy analysis, with one course in economics and the other in political science. The four additional electives required for a minor are upper-division policy-related courses in the social and natural sciences. Except by petition to the coordinator, two of the courses must be from the policy tools section below, and two must be from the applied policy section listed below. Students may also petition the coordinator to allow courses not listed below to count toward the minor requirements. These courses must be policy-related.

Statistics Prerequisites

Statistics courses are necessary to provide a solid analytical foundation to policy analysis by allowing students to confront the data in a careful and systematic fashion.

A calculus-based statistics course covering multiple regression techniques is required. This requirement should typically be met by Economics 120A–120B or Mathematics 180A–181A.

Economics 120A–120B:

Econometrics: (Economics 120A-B conjoined with Economics 120AH-BH.) Probability and statistics used in economics. 120A covers probability and basic statistical methods. 120B covers regression and related methods. 120C covers more advanced methods and usually requires an independent empirical project. Prerequisites: Economics 1A-B or 2A-B and Mathematics 1A-B-C and Economics 60. Credit not allowed for both Economics. 120A and Mathematics 183.

or

Mathematics 180A-181A:

Mathematics 180A: Introduction to Probability. Probability spaces, random variables, independence, conditional probability, distribu-

tion, expectation, joint distributions, central-limit theorem. Three lectures. Prerequisite: Mathematics 2DA or 20D or 21D

Mathematics 181A: Introduction to Mathematical Statistics. Random samples, linear regression, least squares, testing hypotheses, and estimation. Neyman-Pearson lemma, likelihood ratios. Three lectures, one recitation. Prerequisites: Mathematics 180A and 2EA or 20F.

or

BIEB 100 and BIEB 179:

BIEB 100. Biometry. This course provides an introduction to the use of statistics in biological problems. Topics include parametric statistics (t-tests, correlation, regression, ANOVA), non-parametric statistics, and experimental design. Students are introduced to statistical software on the Macintosh computer. Three hours of lecture and two hours of section. Prerequisite: BILD 3.

BIEB 179. Conservation Biology Laboratory. 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 lab. Prerequisite: BIEB 178. (May be taken concurrently).

CORE COURSES

The core of policy analysis consists of a framework for identifying, analyzing, and solving social problems through government policy. A description of current institutions and current policy problems is essential. Next, empirical and theoretical analysis is necessary to find the causes of these problems failures. Finally, students of public policy need to know the economic and political tools that can help remedy societal problems and can promote social goals.

Economics 130. Public Policy: 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 2A-B.

Political Science 160AA. Introduction to Policy Analysis. 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. Prerequisites: Political Science 10, 11 and Economics 1A or 1B.

ELECTIVES

A public policy minor requires four of the following electives and must include two courses in the policy tools sequence and two courses in the applied policy sequence. No more than two courses in any one department can be counted toward the electives requirement. The intent is to encourage students to acquire additional tools, along with the applications. At the same time, a student with a major in, say, economics is required to gain some breadth in other subjects. Students are reminded that a course counted toward the major cannot also count toward the minor.

POLICY TOOLS COURSES:

AMES 119A. Thermodynamics Systems

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 171. Decisions under Uncertainty

Political Science 102B. Politics of American Economic Policy

Political Science 160AB. Introduction to Policy Analysis

SIO 276. Quantitative Theory of Populations and Communities

Sociology A 107. Demographic Methods

Sociology A 108A. Survey Research Design

Sociology A 108B. Quantitative Analysis of Survey Data

APPLIED POLICY COURSES:

AMES 119B. Energy; Non-Nuclear Energy Technologies

AMES 119C. Energy; Nuclear Energy Technologies

BIEB 121. Ecology Lab

BIEB 165. Sociobiology Lab

BIEB 176. Conservation and the Human Predicament

BIEB 178. Principles of Conservation Biology

Chemistry 149A. Environmental Chemistry

Chemistry 149B. Environmental Chemistry

Chemistry 173. Atmospheric Chemistry

Communication/SF 121. National Policies in Global Communications

Communication/SF 122.

Communication/SF 128. Information Technology: Culture, Society, Politics

Earth Sciences 142. Atmospheric Chemistry and the Biochemical Cycles of Atmospheric Trace Gases

Economics 125. Economics of Population Growth

Economics 131. Economics of the Environment

Economics 132. Energy Economics

Economics 145. Economics of Ocean Resources

IRPS 458. International Environmental Policy

Political Science 167. Seminar, Public Policy Analysis

SIO 202. Introduction to Climate and Climate Change

SIO 236. Satellite Remote Sensing

SIO 275A. Topics in Community Ecology

SIO 275B. Natural History of Coastal Habitats

SOC/C 140. Sociology of Law

SOC/C 141. Crime and Society

SOC/C 144. Forms of Social Control

SOC/C 148. Political Sociology

SOC/C 152. Social Inequality and Public Policy (Same as USP 133.)

SOC/C 188K. American Society.

CONCENTRATIONS WITHIN THE MINOR

Below are some examples of elective course sequences that would allow concentration on particular subfields and would also fulfill the minor's requirements.

Example 1: General Natural Science Majors:
AMES 119A, Economics 171, BIEB 178, and SIO 275A (or 275B)

Example 2: General Social Science Majors:
Economics 151, PS 160 AB, Economics 111, and Political Science 167

Examples 3: Population Policy:
SIO 276, Soc A 107, BIEB 176, and Economics 125

Example 4: Energy Policy:
AMES 119A, Political Science 102B, Economics 132, SIO 202

Example 5: Ocean Policy:
Political Science 160AB, SIO 276, Economics 145, SIO 275A (or 275B)

Example 6: Environmental Policy:
Economics 151, SIO 276, BIEB 178, Economics 131

Example 7: Communication Policy:
Political Science 160AB, Sociology A 108A (or 108B); Communication/SF 121, 122, or 128 (two out of the three)

Religious Studies

Office: 4005 Humanities and Social Sciences Building, Muir College, (619) 534-8849

Faculty

Henry E. Allison, *Philosophy*
Alain J.J. Cohen, *Literature*
Stephen Cox, *Literature*
Page A. duBois, *Literature*
William C. Fitzgerald, *Literature*
David Noel Freedman, *History*
Richard E. Friedman, *Literature*
Ali Gheissari, *Sociology*
David Goodblatt, *History*
Ramon A. Gutierrez, *History, Ethnic Studies*
Alan C. Houston, *Political Science*
Fanny Q. Howe, *Literature*
S. Nicholas Jolley, *Philosophy*
David K. Jordan, *Anthropology*
Bennetta W. Jules-Rosette, *Sociology*
Hasan Kayali, *History*
Sanford A. Lakoff, *Political Science*
Edward N. Lee, *Philosophy*
Tanya M. Luhrmann, *Anthropology*
Richard P. Madsen, *Sociology*
John A. Marino, *History*
Michael E. Meeker, *Anthropology*
Alden A. Mosshammer, *History*
Sheldon A. Nodelman, *Visual Arts*
Fitz John P. Poole, *Anthropology*
William H. Propp, *History*
Fred V. Randel, *Literature*
Edward Reynolds, *History*
Theodore Schwartz, *Anthropology*
Gershon Shafir, *Sociology*
Melford E. Spiro, *Anthropology*
Tracy B. Strong, *Political Science*
Christena Turner, *Sociology*
Donald F. Tuzin, *Anthropology*
Wai-Lim Yip, *Literature*

The Program in Religious Studies provides students with broad training in three areas: major religious traditions, diverse disciplinary approaches to the study of religion, and an understanding of the issues and problems that religions seek to solve. At UCSD, faculty from the Departments of Anthropology, History, Literature, Philosophy, Political Science, Sociology, and Visual Arts provide students with the opportunity to pursue a concentration in either the field of religions of Southwest Asia, Mediterranean, and European origin or the comparative field of religion and culture. Students are able to examine the texts, symbols, myths, rituals, ideas, values, ethical systems, and institutions of religious traditions in a cultural and historical context.

A concentration in religious studies aims at increasing a student's understanding of the human experience through history and cultures. The goal is not to fashion "experts" in religion, but rather, like any good liberal art, to use the discipline as a way of developing critical thinking and of probing into the broadest questions of meaning and value.

Lower-Division Preparation

Since the Program in Religious Studies is an interdisciplinary and comparative approach to the study of religious traditions, lower-division preparation can be wide and varied. Exposure to one or more great religious traditions, the study of ideas and methods of analysis, and courses that focus on textual and contextual analysis would all be good introductions to some of the problems of religions in culture. Recommended courses include: ANLD 22-23-24; HILD 2A-B-C; LTGN 19A-B-C; LTEN 21-22-23; Phil. 31-32-33; Soc/L 1A-B and ANLD 22; Eleanor Roosevelt College Making of the Modern World and Revelle College Humanities.

The Program in Religious Studies strongly encourages foreign language study. Many upper-division courses in various religious traditions are text based, and ability to read the languages in the original sources is highly recommended.

Major Requirements

Major programs in religious studies should include the following upper-division courses:

1. Three-quarter sequence in Religious Traditions (RELI 100, 101, 102).
2. One quarter of methodology (ANGN 141, ANGN 147, Phil. 160, or Soc/C 156).
3. Six quarters in the field of religious traditions of Southwest Asia, Mediterranean and European origin.
4. Two quarters in either the field of religious traditions of South and East Asia origin or the general comparative/methodological field.

The courses listed under "Topics" and/or "Context" headings can be taken for religious studies credit after consultation with and approval from the religious studies adviser and the course instructor.

A typical twelve-course major program with a focus on early religions would include the three-quarter Religious Traditions sequence (RELI 100, 101, 102); one quarter of methodology (Phil. 160); six quarters in the field of religious traditions of Southwest Asia, Mediterranean and European origin (HINE 104, HINE 160, Phil. 103, Soc/D 188H, Vis. Arts 120C and LTGN 148); and two quarters in the general comparative/methodological field (Phil. 108 and Vis. Arts 121A).

With the addition of new faculty members specializing in South and East Asian religions, the Program in Religious Studies eventually plans to provide for the option of a concentration in religious traditions of South and East Asia origin (six quarters in the field of religious traditions of South and East Asia origin and two quarters in either the field of religious traditions of Southwest Asia, Mediterranean and

European origin or the general comparative methodological field).

The minor in religious studies consists of six upper-division courses. The three-quarter sequence in Religious Traditions (RELI 100, 101, 102) is required of all minors. Three other upper-division courses selected from the approved offerings complete the minor.

A typical six-course minor would include the three-course requirement (RELI 100, 101, 102); one course in the general comparative/methodology field; and two courses in a specific religious tradition (either Southwest Asia, Mediterranean and European or South and East Asia origin).

COURSES

REQUIRED COURSES

RELI 100. Religious Traditions: Ancient Near Eastern Religions (4)
A comprehensive study of the ancient religious traditions of the world. The course will cover tribal religions, classical polytheism, and the religion of the ancient Hebrews. This course is required for all religious studies majors and minors. *Prerequisite: upper-division standing.* (This course is cross-listed as HITO 100.)

RELI 101. Religious Traditions: Judaism, Christianity, Islam (4)
A comprehensive study of the Western religious traditions. The course will cover Judaism, Christianity, and Islam. This course is required for all religious studies majors and minors. *Prerequisite: upper-division standing.* (This course is cross-listed as HITO 101.)

RELI 102. Religious Traditions: South and East Asian Religious Traditions (4)
A comprehensive study of the Asian religious traditions. The course will cover Hinduism, Buddhism, Taoism, Shinto, and Confucian thought. This course is required for all religious studies majors and minors. *Prerequisite: upper-division standing.* (This course is cross-listed as HITO 102.)

One methodological course from those below marked with an asterisk is required of all majors.

APPROVED ELECTIVE COURSES

For descriptions of the courses listed below, please refer to the appropriate department's section of this catalog.

General Comparative/ Methodological

ANGN 139. Religious Cults and Social Movements
*ANGN 141. Religion and Society
*ANGN 147. Ritual and Symbolism
ANGN 165. Approaching the Sacred
ANGN 193. Witchcraft, Shamanism, and Psychiatry
Phil. 108. Mythology and Philosophy
*Phil. 160. Philosophy of Religion
*Soc/C 156. Sociology of Religion
Soc/C 157. Religion in Contemporary Society
Vis. Arts 121A. Prehistoric Art
Vis. Arts 127B. Western and Non-Western Rituals and Ceremonies

Religious Traditions of Southwest Asia, Mediterranean and European Origin

HIEU 105. The Early Christian Church
HIEU 125. Reformation Europe
HIEU 145. European Jewry: 1750–1880
HIEU 162. Special Topics in the History of Early Christianity
HINE 100. The Ancient Near East and Israel
HINE 101. Hebrew Prophetic Literature
HINE 102. The Jews in Their Homeland in Antiquity
HINE 103. The Jewish Diaspora in Antiquity
HINE 104. The Bible and the Ancient Near East
HINE 160. Special Topics in the Bible and Ancient Near East
HISC 162. Problems in the History of Science and Religion
LTEN 118. Milton
LTEN 147. Metamorphoses of the Symbol
LTGN 148. The Bible and Western Literature
LTGN 150. Jewish Mysticism
LTGN 151. The Bible: The Prophetic Books
LTGN 152. The Bible: The Narrative Books
LTGN 153. The Bible: The Poetic Books
LTGN 154. Medieval Hebrew Literature
LTGN 156. Topics in the Prophets
LTGN 157. Topics in Biblical Narrative
LTGN 158. Topics in Biblical Poetry
LTGK 120. New Testament Greek
Phil. 103. Medieval Philosophy
Phil. 104. The Rationalists
Phil. 161. Religious Existentialism
Soc/D 158. Islam in the Modern World
Soc/D 188F. Modern Jewish Societies and Israeli Society
Soc/D 188H. Middle Eastern Societies
Vis. Arts 120C. Late Antique Art

Religious Traditions of South and East Asia Origin

ANRG 152. Gandhi: The Man and His Society
ANRG 173. Chinese Popular Religion
Soc/D 158J. Religion and Ethics in China and Japan

TOPICS COURSES*

General Comparative/ Methodological

LTGN 181. Mythology
LTGN 185. Literature and Ideas
Soc/C 159. Special Topics in the Sociology of Organizations and Institutions

Religious Traditions of Southwest Asia, Mediterranean and European Origin

HINE 166. Nationalism in the Middle East
HINE 170. Special Topics in Jewish History
LTGN 120. Yiddish Literature in Translation
LTGN 149. The Jewish Experience in Literature
LTGN 155. Hebrew Literature: The Modern Period

Religious Traditions of South and East Asia Origin

HIEA 160. Colloquium on Modern Japanese History
HIEA 167. Special Topics in Modern Chinese History

CONTEXT COURSES*

Religious Traditions of Southwest Asia, Mediterranean and European Origin

HINE 108. The Middle East Before Islam
HINE 114. History of the Islamic Middle East
Poli. Sci. 110A. Systems of Political Thought: Western, Ancient, Medieval
Poli. Sci. 110B. Systems of Political Thought: Machiavelli to French Revolution
Poli. Sci. 110C. Systems of Political Thought: The Nineteenth Century
Poli. Sci. 120A. Political Development of Western Europe
Vis. Arts122A. Art of the Middle Ages
Vis. Arts122B. Renaissance Art
Vis. Arts123A. Italian Art of the Early Renaissance
Vis. Arts123B. High Renaissance Art
Vis. Arts123C. Michelangelo
Vis. Arts123F. Castles, Cathedrals, and Cities
Vis. Arts123H. Images of Women in Medieval and Renaissance Art

Vis. Arts123I. The Illuminated Manuscript in the Middle Ages.

*Courses listed under these headings require special approval for Religious Studies credit.

For further course offerings and/or Topics or Context Course approvals, contact the Program in Religious Studies Office.

Revelle College

OFFICE: Office of the Provost, Revelle College

Humanities/Writing Program

OFFICE: 1512 Galbraith Hall, 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). Additional free computer time and 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 an honors seminar, Revelle 100. At least five outstanding graduating seniors are honored at graduation each year with a monetary honorarium.

An honors banquet is given for the top one hundred 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)

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.* (Not offered in 1996–97.)

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)

Russian and Soviet Studies

OFFICE: 7039 Humanities and Social Sciences Building, Muir College

Faculty

Steven Cassedy, Ph.D., *Professor in Literature*
Frantisek Deak, Ph.D., *Professor in Theatre*
Robert Edelman, Ph.D., *Professor in History*
Susan Larsen, Ph.D., *Assistant Professor in Literature*
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 six courses, at least three 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 six courses may be language courses. Knowledge of the language is not a requirement for the minor, but it is strongly recommended.

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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 101A-B-C (Advanced 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).

CO[redacted]ES

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 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 133 Russian and Soviet Drama (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

Director, Gerald Doppelt

Professors

Paul M. Churchland, Ph.D., *Philosophy*
Gerald D. Doppelt, Ph.D., *Philosophy*
Philip S. Kitcher, Ph.D., *Philosophy*
Chandra Mukerji, Ph.D., *Sociology and Communication*
Martin J.S. Rudwick, Ph.D., *History*
Andrew Scull, Ph.D., *Sociology*
Steven Shapin, Ph.D., *Sociology*
Robert S. Westman, Ph.D., *History*

Associate Professors

Robert Marc Friedman, Ph.D., *History*
Martha Lampland, Ph.D., *Sociology*
Sandra D. Mitchell, Ph.D., *Philosophy*

Assistant Professors

Adrian Cussins, Ph.D., *Philosophy*
Steven Epstein, Ph.D., *Sociology*

The Science Studies Program at UCSD is a Ph.D. program committed to working toward a deeper understanding of scientific knowledge by means of studies–theoretically structured and empirially based–of the practice of the sciences, past and present. The program offers students an opportunity to integrate the perspectives developed in 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 three disciplines for their major field of specialist studies and are required to complete minor field requirements in the other two. The core of the program, however, is a sequence of two one-quarter seminars, led by faculty from all three participating departments. Science studies students are encouraged to select dissertation topics that offer scope for a cross-disciplinary approach. The Ph.D. will be awarded in "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, therefore, 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.*

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.*

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.*

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.*

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. *Prerequisite: 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 163/263. Topics in the History of Life and Earth Sciences (4)
Intensive study of specific problems in the life sciences and earth sciences, ranging in period from the Renaissance to the twentieth century. 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 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 166/266. Topics in the History of the Social Sciences (4)
Intensive study of specific problems in the history of the social sciences in relation to the natural sciences and mathematics. 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 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.*

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. 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.*

Science, Technology, and Public Affairs

OFFICE: 1512 Galbraith Hall, 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 non-living resources; coastal zone management; military and social aspects; and the sea in weather and climate. *Prerequisite: none* (F)

UPPER-DIVISION

100. Seminar in Science, Technology, and Public Affairs (4)
A seminar dealing with the historical, political, and ethical questions involved with the development of nuclear weapons, long-range missiles, and space exploration. *Prerequisite: upper-division standing or consent of instructor.* May not be offered every year.

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 socio-economic development and health. *Prerequisite: senior or graduate standing. H.Simon* (F)

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):

AMES 119A, 119B, 119C

Communication/SF 128

CSE 2

Economics 130

Philosophy 186

Political Science 160AA

Political Science 160AB

Political Science 161

Political Science 166D

Political Science 167A,B

Sociology 116

Sociology 168E

Scripps Institution of Oceanography

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

Professors

Duncan C. Agnew, Ph.D., *Geophysics*
Laurence Armi, Ph.D., *Oceanography*
Gustaf Arrhenius, Ph.D., *Oceanography*
Jeffrey L. Bada, Ph.D., *Marine Chemistry*
Wolfgang H. Berger, Ph.D., *Oceanography*
Michael J. Buckingham, Ph.D., *Oceanography*
Ronald S. Burton, Ph.D., *Marine Biology*
Steven C. Cande, Ph.D., *Marine Geophysics*
Russ E. Davis, Ph.D., *Oceanography*
Paul K. Dayton, Ph.D., *Oceanography*
LeRoy M. Dorman, Ph.D., *Geophysics*
James T. Enright, Ph.D., *Behavioral Physiology*
D. John Faulkner, Ph.D., *Marine Chemistry*
William H. Fenical, Ph.D., *Chemistry*
Edward A. Frieman, Ph.D., *Physics, Vice Chancellor of Marine Sciences and Director of Scripps Institution of Oceanography*
Carl H. Gibson, Ph.D., *Engineering Physics and Oceanography*
Joris M. T. M. Gieskes, Ph.D., *Oceanography*
J. Freeman Gilbert, Ph.D., *Geophysics*
Robert T. Guza, Ph.D., *Oceanography*
James W. Hawkins, Ph.D., *Geology*
Myrl C. Hendershott, Ph.D., *Oceanography*
Robert R. Hessler, Ph.D., *Biological Oceanography*
John A. Hildebrand, Ph.D., *Geophysics*
William S. Hodgkiss, Ph.D., *Electrical Engineering*
Nicholas D. Holland, Ph.D., *Marine Biology*
Glenn R. Ierley, Ph.D., *Oceanography*
Miriam Kastner, Ph.D., *Earth Sciences*
Charles D. Keeling, Ph.D., *Oceanography*
William A. Kuperman, Ph.D., *Oceanography*
Devendra Lal, Ph.D., *Nuclear Geophysics*
Lisa A. Levin, Ph.D., *Oceanography, and Vice Chair of the Department*
Peter F. Lonsdale, Ph.D., *Oceanography*
J. Douglas Macdougall, Ph.D., *Earth Sciences*
T. Guy Masters, Ph.D., *Geophysics*
W. Kendall Melville, Ph.D., *Oceanography*
Jean-Bernard H. Minster, Ph.D., *Geophysics*
Michael M. Mullin, Ph.D., *Oceanography*
William A. Newman, Ph.D., *Oceanography*

Pearn P. Niiler, Ph.D., *Oceanography*
John A. Orcutt, Ph.D., *Geophysics*
Robert L: Parker, Ph.D., *Geophysics*
Jason Phipps Morgan, Ph.D., *Geophysics*
Robert Pinkel, Ph.D., *Oceanography*
V. Ramanathan, Ph.D., *Geophysical Sciences*
Dean H. Roemmich, Ph.D., *Oceanography*
Richard H. Rosenblatt, Ph.D., *Marine Biology, and Chair of the Department*
Richard L. Salmon, Ph.D., *Oceanography*
David T. Sandwell, Ph.D., *Geophysics*
John G. Sclater, Ph.D., *Marine Geophysics*
Peter M. Shearer, Ph.D., *Geophysics*
Richard C.J. Somerville, Ph.D., *Meteorology*
George Sugihara, Ph.D., *Mathematical Ecology*
Lynne D. Talley, Ph.D., *Oceanography*
Lisa Tauxe, Ph.D., *Geophysics*
Victor D. Vacquier, Ph.D., *Marine Biology*
Martin Wahlen, Ph.D., *Geochemistry*
Ray F. Weiss, Ph.D., *Geochemistry*
Clinton D. Winant, Ph.D., *Oceanography*
Edward L. Winterer, Ph.D., *Geology*
William R. Young, Ph.D., *Oceanography*
George E. Backus, Ph.D., *Geophysics, Emeritus*
Andrew A. Benson, Ph.D., *Biology, Emeritus*
Charles S. Cox, Ph.D., *Oceanography, Emeritus*
Harmon Craig, Ph.D., *Geochemistry and Oceanography, Emeritus*
Joseph R. Curray, Ph.D., *Geology, Emeritus*
Seibert Q. Duntley, Sc.D., *Physics, Emeritus*
Edward D. Goldberg, Ph.D., *Chemistry, Emeritus*
Harold T. Hammel, Ph.D., *Physiology, Emeritus*
Richard A. Haubrich, Ph.D., *Geophysics, Emeritus*
Francis T. Haxo, Ph.D., *Biology, Emeritus*
Douglas L. Inman, Ph.D., *Oceanography, Emeritus*
Gerald L. Kooyman, Ph.D., *Biology, Emeritus*
Ralph A. Lewin, Ph.D., Sc.D., *Biology, Emeritus*
John A. McGowan, Ph.D., *Oceanography, Emeritus*
Walter H. Munk, Ph.D., *Oceanography, Emeritus*
William A. Nierenberg, Ph.D., *Geophysics, Director, Emeritus*
Joseph L. Reid, M.S., *Oceanography, Emeritus*
George G. Shor, Jr., Ph.D., *Marine Geophysics, Emeritus*
Fred N. Spiess, Ph.D., *Oceanography, Emeritus*
Victor Vacquier, M.A., *Geophysics, Emeritus*
Charles W. Van Atta, Ph.D., *Engineering Physics and Oceanography, Emeritus*
Benjamin E. Volcani, Ph.D., *Microbiology, Emeritus*
Kenneth M. Watson, Ph.D. *Physical Oceanography, Emeritus*

Associate Professors

Douglas H. Bartlett, Ph.D., *Marine Microbiology*
David M. Checkley, Ph.D., *Oceanography*
Catherine G. Constable, Ph.D., *Geophysics*
Horst Felbeck, Dr. rer. nat., *Marine Biology*
Margo G. Haygood, Ph.D., *Marine Biology*
Timothy D. Herbert, Ph.D., *Geology*
Mark D. Ohman, Ph.D., *Oceanography*
Robert E. Shadwick, Ph.D., *Marine Biology*
Bradley T. Werner, Ph.D., *Oceanography*

Assistant Professors

Kevin M. Brown, Ph.D., *Geology*
Paterno R. Castillo, Ph.D., *Geology*
Paola Cessi, Ph.D., *Oceanography*
Christopher D. Charles, Ph.D., *Oceanography*
Peter J. S. Franks, Ph.D., *Oceanography*
David R. Hilton, Ph.D., *Geochemistry*
Ralph F. Keeling, Ph.D., *Geochemistry*
Brian Palenik, Ph.D., *Marine Biology*
Daniel L. Rudnick, Ph.D., *Oceanography*
Wuchang Wei, Ph.D., *Oceanography*

Professor-in-Residence

Farooq Azam, Ph.D., *Biology*

Associate Professor-in-Residence

Andrew G. Dickson, Ph.D., *Marine Chemistry*

Adjunct Professors

Paul J. Crutzen, Ph.D., *Atmospheric Chemistry*
Douglas P. DeMaster, Ph.D., *Oceanography*
Richard B. Deriso, Ph.D., *Biological Oceanography*
John R. Hunter, Ph.D., *Marine Biology*
Michael S. Longuet-Higgins, Ph.D., *Oceanography*
William F. Perrin, Ph.D., *Marine Biology*
Paul E. Smith, Ph.D., *Biological Oceanography*
George N. Somero, Ph.D., *Biology*

Senior Lecturers

Jonathan Berger, Ph.D., *Research Geophysicist*
Yehuda Bock, Ph.D., *Research Geodesist*
George F. Carnevale, Ph.D., *Research Oceanographer*
Steven C. Constable, Ph.D., *Research Geophysicist*
Jeffrey B. Graham, Ph.D., *Research Biologist*
Osmund Holm-Hansen, Ph.D., *Research Biologist*
Mark E. Huntley, Ph.D., *Research Biologist*
Robert A. Knox, Ph.D., *Research Oceanographer*
David P. Rogers, Ph.D., *Research Meteorologist Oceanographer*
Richard J. Seymour, Ph.D., *Research Engineer*
Kenneth L. Smith, Jr., Ph.D., *Research Biologist*
Elizabeth L. Venrick, Ph.D., *Research Biologist*
Peter F. Worcester, Ph.D., *Research Oceanographer*
A. Aristides Yayanos, Ph.D., *Research Biologist*

Lecturers

Nancy A. Bray, Ph.D., *Associate Research Oceanographer*
Bruce D. Cornuelle, Ph.D., *Associate Research Oceanographer*
Jeffrey S. Gee, Ph.D., *Assistant Research Geophysicist*
Holly E. Given, Ph.D., *Assistant Research Geophysicist*
Alistair J. Harding, Ph.D., *Associate Research Geophysicist*
Thomas L. Hayward, Ph.D., *Associate Research Oceanographer*
Jules S. Jaffe, Ph.D., *Associate Research Oceanographer*
John L. Largier, Ph.D., *Assistant Research Oceanographer*
Michael I. Latz, Ph.D., *Associate Research Biologist*
B. Gregory Mitchell, Ph.D., *Associate Research Oceanographer*
Jerome A. Smith, Ph.D., *Associate Research Oceanographer*
James H. Swift, Ph.D., *Associate Research Oceanographer*
Bradley M. Tebo, Ph.D., *Associate Research Biologist*
Spahr C. Webb, Ph.D., *Associate Research Oceanographer*
Mark A. Zumberge, Ph.D., *Associate Research Geophysicist*

Affiliated Faculty

James R. Arnold, Ph.D., *Professor, Chemistry*
Hugh Bradner, Ph.D., *Professor Emeritus, AMES*
Theodore H. Bullock, Ph.D., *Professor Emeritus, Neurosciences*
John W. Miles, Ph.D., *Professor Emeritus, AMES*
R. Glenn Northcutt, Ph.D., *Neurosciences*

The graduate department of the Scripps Institution of Oceanography offers graduate instruction leading to M.S. and Ph.D. degrees in oceanography, in marine biology, and in earth sciences. Emphasis is on the Ph.D. program. A student's work normally will be concentrated in one of several curricular programs within the department. These programs include biological oceanography, marine biology, geochemistry and marine chemistry, geological sciences, geophysics, physical oceanography, applied ocean sciences, and climate sciences.

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 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 research vessels and other facilities of the Scripps Institution and its associated laboratories (including the Institute of Geophysics and Planetary Physics) are available to department students, many of whom participate in oceanographic research at sea.

The Curricular Programs

Biological Oceanography is the field of study concerned with the interactions of populations of marine organisms with one another and with their physical and chemical environment. Since these interactions are frequently complex, and since the concepts and techniques used in investigating the environment and the populations are drawn from many fields, biological oceanography is, of necessity, interdisciplinary. Therefore, studies in physical oceanography, marine chemistry, and marine geology, as well as biology, are pertinent. Research activities in this curriculum include studies of the factors influencing primary and secondary productivity and nutrient regeneration, fishery biology and management, community ecology of benthic and pelagic forms, population dynamics, habitat changes and disruption, systematics, evolution, biogeography, behavior as it affects distribution, and sampling problems. Theoretical, experimental, and direct observational approaches to these problem areas are conducted.

Marine Biology is the study of marine organisms, their development, and their adaptations. It is, therefore, concerned with the evolutionary, organismic, genetic, physiological and biochemical processes in marine organisms, and the relationship between them and their environment, both biotic and physical. It encompasses several major areas of modern biology, and is interpreted from the viewpoints gained through understanding the physical and chemical dynamics of the seas. Research activities of faculty members in the curriculum currently include microbiology, ultra-structure, photobiology, barobiology, cardiovascular physiology, biomechanics, comparative biochemistry, comparative and cellular physiology, neurophysiology and behavior, ecology, developmental biology, genetics, and distribution and evolution of marine animals and plants.

Geochemistry and Marine Chemistry 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; 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 fresh-water systems.

Geological Sciences emphasizes the application of observational, experimental, and theoretical methods of the basic sciences to the understanding of the solid Earth, history of ocean, atmosphere, and the solar system. Principal sub-programs are marine geology (including aspects of geophysics, geochemistry, paleontology, geomorphology) and petrology. Expedition work at sea and field work on land are emphasized as essential complements to laboratory and theoretical studies. Marine geology is the field of study concerned with the origin, properties, and history of ocean basins and with the geological processes that affect them. Research areas include tectonics and volcanism; geomorphology, structure, and deformation of the oceanic crust and continental margins, utilizing both geophysical and geological techniques; deep sea and continental margin sedimentation, stratigraphy, and paleontology; and beach and nearshore processes. Petrology is the study of the origin and history of the rock complexes of the Earth's crust and upper mantle, with emphasis on the igneous, metamorphic, and sedimentary rocks of the ocean basins and their margins, the characteristics and interrelations of the oceanic and continental crust, and studies of lunar and meteoritic materials.

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.

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.

Applied Ocean Sciences is an interdepartmental program concerned with human's purposeful and useful intervention into the sea. The program combines the interests of faculty members of the Scripps Graduate Department, the Department of Applied Mechanics and Engineering Sciences, and the Department of Electrical and Computer Engineering to produce oceanographers who are knowledgeable of modern engineering and engineers who know about the oceans. Instruction and research are not restricted to structural, mechanical, material, electrical, and physiological problems of operating within the ocean but include the applied environmental science of the sea as well. 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. Present research activities within the curricular group include studies of: upper-ocean physics and air-sea interaction; remote sensing of the sea surface; ocean bottom microseisms and crustal displacements associated with earthquakes; seismic tomography; bathymetric, magnetic, and gravimetric surveys; marine electromagnetics; remotely-operated, cable-controlled vehicles and stations on the sea floor; ocean optics; signal processing; swath bathymetric mapping, and high-resolution imaging sonar systems; ocean acoustics and acoustical oceanography; turbulent flows and formation of barrier beaches; mechanisms of currents, sand transport, and sediment transport in the surf zone, the shelf, and in submarine canyons.

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 Nino; 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.

Requirements for Admission

Candidates for admission should have a bachelor's or master's degree in one of the physical, biological, or earth sciences; in some cases a degree in mathematics or engineering science is 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. Applicants for admission are required to submit scores on the aptitude test (and, for marine biology only, the advanced biology test) of the Graduate Record Examinations given by the Educational Testing Service of Princeton, New Jersey.

Specific additional requirements for admission to the various curricular programs are as follows:

Biological oceanography—two years of chemistry, including general and organic chemistry (physical chemistry requiring calculus may be substituted for physics requiring calculus where a more elementary physics course was taken); and a year of general biology (or zoology or botany). Normal preparation should also include a course in general geology and at least one course in each of the following three 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 for one or more of the above.

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 (biochemistry and physical chemistry will be expected of students in experimental biology, although the student may, if necessary, enroll in these courses after admission). Training in one or more of the following areas is strongly recommended: cellular biology, molecular biology, comparative physiology, genetics, developmental biology, ecology, comparative anatomy, vertebrate and invertebrate zoology, microbiology, and botany.

Geochemistry and marine chemistry—major in chemistry, geology, biochemistry, or related field.

Geological sciences—major in one of the earth sciences or physical or inorganic chemistry. Physical chemistry and calculus are required, and preparation beyond the minimum requirements in mathematics, physics, and chemistry is strongly recommended.

Geophysics—major in physics or mathematics, or equivalent training.

Physical oceanography—major in a physical science, including three years of physics and mathematics.

Applied ocean sciences—major in physical science or engineering science, including three years of physics or applicable engineering and three years of mathematics at college level.

Climate sciences—students are admissible if they satisfy the admission requirements of the physical oceanography, geophysics, or geochemistry and marine chemistry curricular programs. Biology and geology majors may also be admissible if they have a strong background in mathematics and physical science.

Candidates with preparation different from that given above can be admitted only if their undergraduate or previous graduate record has been outstanding. It is possible to make up most shortcomings in preparation with courses available at UCSD.

Programs of Study

Because of limited facilities, the department does not encourage students who wish to proceed only to the M.S. If circumstances warrant, the degree is normally offered under Plan II (comprehensive examination) after completion of course work established by the department.

Thesis Plan I: A course of study must include forty-eight units of credit. Of the forty-eight units, twenty-four units in graduate courses, including at least sixteen units in graduate-level courses in the major field; sixteen additional units in graduate or upper-division courses; and eight units in research work leading to the thesis.

Comprehensive Examination Plan II: A course of study must include forty-eight units of credit. Of the forty-eight units, thirty-two units in graduate courses, including at least twenty units in graduate-level courses in the major field; and sixteen additional units in graduate or upper-division courses.

The program of study for the Ph.D. degree is determined in consultation with the student's adviser (after the first year, the chair of the student's guidance or doctoral committee). General requirements of the curricular groups are as follows:

Biological Oceanography

The student will be expected to be familiar with the material presented in the following courses: SIO 205, 210, 240, 260, 270, 275A or 277, 280, and at least one of 271, 274, 282, 283, 284, or 294. Other course work ordinarily will be recommended by the student's advisory committee, usually including 278 (or equivalent) 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. There is no formal language requirement. Individual advisers and/or doctoral committees may require foreign languages of individual candidates.

Marine Biology

Entering graduate students will be encouraged to gain a varied research experience in several laboratories during their first year. In the spring term of their first year at SIO, students will take the departmental examination, at which time they will be expected to demonstrate competence in general biology and in the material covered in the following courses: SIO 210, 240, 260, 280, as well as any other course work recommended by the advisory committee. All students are expected to enroll and actively participate in a seminar course during two quarters of each year. There is no formal language requirement. However, individual advisers and/or doctoral committees may require appropriate foreign languages of individual candidates.

Geochemistry and Marine Chemistry

Depending upon their personal needs and research interests as determined in consultation with a faculty adviser, students in this curriculum will be expected to take SIO and UCSD courses in some of the following disciplines: marine chemistry, physical oceanography, marine geology, atmospheric chemistry, marine biology, biological oceanography, chemistry, and mathematics. There is no general language requirement.

Geological Sciences

The geological sciences curricular group offers programs leading to the Ph.D. either in earth sciences or oceanography. The only general requirement is responsibility for material offered in Essentials of Geology (SIO 248A-B-C-D), and participation in the Classics Seminar (SIO 258A-B-C-D) during the first two years of graduate studies. The "basic" courses (SIO 210, 260, and 280) as well as active participation in research at sea are considered essential for the oceanography degree. Some, or all, of these courses will normally be taken by candidates for the earth sciences degree. Other courses in oceanography and related areas will be selected and scheduled depending on the student's background and interests. In some cases a student's program may include course work in selected subject areas given at other campuses. Normally students will take a comprehensive department examination near the end of their third quarter of residence. The doctoral qualifying examination will be given during the second year of residence. There is no formal language requirement.

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. In the summer or early fall quarter of the second year of residence 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. There is no formal language requirement.

Physical Oceanography

Students in this curricular program will be expected to demonstrate proficiency in the subjects treated by the following courses: SIO 203A-B-C, 210, 211A-B, 212A-B, 214A-B, 220, 221, 222, one of SIO 240, 260, or 280 plus two additional SIO courses selected with approval by the student adviser. There is no formal language requirement.

Applied Ocean Sciences

Students must: (a) take or demonstrate their knowledge of the following basic courses: SIO 210, 240, 260, 280, and SIO 203A-B-C or Math. 210A-B-C or AMES 294A-B-C, and (b) attend the Applied Ocean Sciences Seminar (SIO 208) throughout their period of enrollment. Additional course requirements for a field of emphasis in a complementary discipline will be established to meet the needs and interests of each individual student by the advisory committee. There is no formal language requirement.

Climate Sciences

The emphasis of this curricular group is on education through interdisciplinary research. All students are responsible for material in the following "core" courses: 202, 210, 260, 218. Students are required to enroll and actively participate in at least two quarters of a seminar course. Students are required to specialize in a specific subdiscipline or track. Additional courses required for this track should be worked out soon after arrival of the student through consultation with his or her advisers. The following pre-approved tracks are offered at this time: (1) atmospheric dynamics and

physics, (2) atmospheric chemistry, (3) paleoclimate studies.

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 primarily oral, although written parts may be included. The student will be required to demonstrate in quantitative and analytical manner comprehension of required subject material and of the pertinent interactions of physical, chemical, biological, or geological factors.

After 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. This committee will determine the student's qualifications for independent research, normally by means of a qualifying examination late in the second year of study or early in the third year, and will supervise the student's performance and reporting of his or her research.

The nature of the qualifying examination varies between curricular groups. In biological oceanography, marine biology, geological sciences, physical oceanography, and applied ocean 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 geochemistry and marine chemistry, the student, in an oral examination, is required to present and defend a single research proposition in his or her specialized area. The student is also 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 candidacy 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. In some cases, individual chapters are published as research articles prior to completion of the entire thesis.

Departmental Ph.D. Time Limit Policies

Students must complete a qualifying examination by the end of three years, and 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.

Special Financial Aids

In addition to teaching and research assistantships, fellowships, traineeships and other awards available on a campus-wide competitive basis, the department has available a certain number of fellowships and research assistantships supported from research grants and contracts, or from industrial contributions.

COURSES

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. Topics in the History of 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. Rudwick, Friedman (W)

202. Introduction to Climate and Climate Change (4)
Physical, dynamical, and thermodynamic processes that govern climate with emphasis on the atmosphere and the oceans. Topics will include energy budget of the oceans and the atmosphere, hydrological cycle, the meridional heat transport, and climate forcing and feedbacks that govern decadal to longer-term changes in climate. *Prerequisites: introductory courses in atmospheric sciences and oceanography; familiarity with solutions of linear differential equations.* Ramanathan (S)

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. *Prerequisite: concurrent registration in ECE 145BL recommended; SIO 204A or consent of instructor.* Buckingham (W)

204C. Advanced Acoustics III (4)
Signal processing in underwater acoustics. Theory and hardwave embodiments. *Prerequisite: concurrent registration in ECE 145CL recommended; SIO 204B or consent of instructor.* Buckingham (S)

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. *Prerequisite: elementary statistics or consent of instructor.* Venrick (S)

206. Sediment Transport as a Complex System (4)
Sediment transport and its influence on landforms, geologic deposits, and organisms will be studied through a critical ex-

amination of the literature, consideration of the fundamental solid and fluid mechanics, and an appeal to new techniques from complex systems analysis. Examples will be drawn from coastal, fluvial-dominated, and arid environments. *Prerequisites: some background in basic solid and fluid mechanics.* (S/U grades permitted.) Werner (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. *Prerequisites: ECE152A-B-C or equivalent.* (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. *Prerequisites: 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. Dynamical Oceanography (4-4)
The equations of motion for rotating stratified flow and their application to large-scale ocean dynamics; the wind-driven circulation, flow over topography, and the dynamics of two-layer models. *Prerequisite: SIO 214A or consent of instructor.* Salmon, Talley (F)

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. (S/U grades permitted.) Armi (S)

214A-B. Introduction to Fluid Mechanics (4-4)
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, Melville, Young, Armi (F,W)

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 CO2 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)

217. Numerical Methods in Geophysical Fluid Dynamics (4)
Useful numerical methods of simulating the large-scale dynamics of oceans and atmospheres: fundamental concepts, classification of problems, introduction to discrete variable methods, stability, convergence, error analysis, elementary properties of finite-difference schemes, implicit methods, spectral methods, nonlinear problems. (Offered in odd-numbered years.) (S/U grades permitted.) Somerville (W)

218. Atmospheric Dynamics and Physics (4)
Thermodynamics and statics of dry and moist air; equations of motion, scale analysis, elementary applications and wave solutions; baroclinic instability theory; atmospheric general circulation and energetics; thermal convection and laboratory analogues to atmospheric motions; turbulence and predictability theory; numerical models for weather forecasting and climate simulation. (Offered in even-numbered years.) (S/U grades permitted.) Somerville (F)

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)

221. Analysis of Physical Oceanographic Data (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: consent of instructor.* (S/U grades permitted.) Davis, Rudnick (W)

222. Analysis of Geophysical Time Series (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)

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 instructors.* (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 instructors.* (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 instructors.* (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)

231. Seismological Methods (4)
Basic instrumentation, seismic noise, spectral analysis, basic elasticity for seismology, earthquake mechanism, earthquake hazard, strong motion, energy and moment, earthquake prediction, seismotectonics. *Prerequisite: consent of instructor.* (S/U grades permitted.) Staff (W)

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, Phipps Morgan (W)

235. Geodesy (4)
An introduction to the science and technology of determining the Earth's shape and gravity field with emphasis on applying this knowledge to geophysical problems. We will discuss both terrestrial measurement methods and the newer space-geodetic techniques. Additional topics include geometric and gravimetric geodesy, geodetic astronomy, and adjustment procedures, with special attention to the determination of crustal deformation. *Prerequisite: consent of instructor.* (S/U grades permitted.) Agnew, Bock (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)

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)

242. Controversies in Geomorphology (4)
Conflicting ideas regarding the relation between physical processes which shape the Earth's surface and the resulting landforms are studied (a) through a critical examination of the literature, (b) using visualization of computer simulations, and (c) in two weekend field trips. *Prerequisite: consent of instructor.* (S/U grades only.) Werner (S)

243. Marine Stratigraphy (4)
Selected topics of current interest in marine stratigraphy, e.g., sequence stratigraphy, seismic stratigraphy, sea level change, plate stratigraphy, stratigraphic resolution, correlation, and the relations of stratigraphy to tectonics. The course content will change from year to year. Offered in alternate years. *Prerequisite: preparation at the level of SIO 248C-D or consent of instructor.* (S/U grades permitted.) Winterer (S)

244. Seminar in Low-Temperature Geochemistry (4)
Discussions of current research in fluid-rock interaction processes, geochemistry, diagenesis, and stable isotope variations in sedimentary minerals and rocks. Offered in alternate years. *Prerequisite: consent of instructor.* (S/U grades permitted.) Kastner (S)

245A. Interpretation of the Sedimentary Record (4)
Sediments provide the most complete record of surface conditions on the Earth, including the climates, ocean and atmospheric compositions and circulation patterns, tectonic environments of the past, the history of sea-level fluctuations, and the evolution of life. This course deals with the sedimentary record, emphasizing interpretation of petrologic and stratigraphic evidence based on direct study of sediments in the laboratory and in the field. *Prerequisites: ES 101 and ES 120 or consent of instructor; taken preferably after SIO 253.* Winterer (F)

245B. Low-Temperature Geochemistry (4)
Geochemistry, diagenesis, and stable isotope variations in sedimentary minerals and rocks, with emphasis on fluid-rock interaction processes important in determining the chemical and isotopic compositions of seawater, sediments, and pore fluids. Offered in alternate years. *Prerequisites: mineralogy, sedimentary petrology, introductory geochemistry and physical chemistry, or consent of instructor.* (S/U grades permitted.) Kastner (W)

246. Seminar in Marine Geology and Geophysics (2)
Student seminars on controversial topics relating to the formation and history of the oceanic crust. Will stress a dynamical approach. *Prerequisite: completion of two quarters of SIO 248 or consent of instructor.* (S/U grades permitted.) Cande, Phipps Morgan, Sandwell, Sclater (F,W)

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)

248A-B-C-D. Essentials of Geology (4-4-4-4)
A rigorous, synoptic sequence of courses for entering graduate students covering major aspects of geology with emphasis on marine problems. Geophysics and Tectonics: plate tectonics, geophysics and tectonics of the crust and upper mantle, spreading centers, plate interiors, and continental margins. Geochemistry and Crustal Evolution: formation of the earth and terrestrial planets, chemical differentiation of the earth, magmatic systems in different tectonic settings, isotope and trace element geochemistry of igneous and metamorphic rocks. Marine Sediments–Distribution and Processes: types of sediments present on the seafloor and processes responsible for the observed distributions in nearshore and shelf environments, continental slope and deep sea. Includes physical and geochemical processes, diagenesis, hydrothermal systems and principles of paleoclimatology. Paleoceanography: the Record in the Rocks–approaches to the interpretation of the stratigraphic record of marine sediments, in terms of paleoceanography, tectonics, sedimentary processes and biotic evolution. *Prerequisite: bachelor's degree in geology/earth sciences or consent of instructor.* (S/U grades permitted.) Staff (F,W,S)

249. Special Topics in Marine Geology (1-4)
Special course offerings by staff and visiting scientists. (S/U grades permitted.) Staff (F,W,S)

251. Nuclear Geophysics and Oceanography (4)
Nuclear methods in geophysics and oceanography with emphasis on applications of natural cosmic ray produced nuclides and U, Th series nuclides; their source functions, applications, and mathematical models will be discussed. These methods include trace element geochemistry; mixing and transfer of substances between the atmosphere, hydrosphere, and the lithosphere; secular variations in the carbon cycle, rates of erosion of natural rock and soil surfaces, and biodynamics of phosphorous in the upper layers of the oceans. *Prerequisite: consent of instructor.* Lal (S)

252. 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. Offered in alternate years. Conjoined with ES 144. *Prerequisite: SIO entrance requirements or consent of instructor.* (S/U grades permitted.) Macdougall, Lal (S)

253. Igneous and Metamorphic Petrology (4)
Physical, chemical, and mineralogic properties of igneous and metamorphic rocks. Emphasis is on the origin and genetic relationships as interpreted from field occurrences, theoretical studies, and experimental data. Offered in alternate years. *Prerequisites: physical geology; geochemistry, mineralogy, physical chemistry* (may be taken concurrently). Hawkins (S)

254. Advanced Igneous Petrology (4)
The origin and evolution of igneous rocks is considered in terms of field and laboratory evidence. Experimental and theoretical studies bearing on igneous processes are discussed and evaluated in the light of geologic occurrences. Special emphasis is given to igneous rocks of the ocean basins and their margins. Typical rock types are analyzed in the laboratory, and their history is interpreted. Offered in alternate years. *Prerequisite: consent of instructor.* Hawkins (S)

255. Crustal Evolution (4)
Comprehensive discussion of the distribution, age, physical and chemical properties, petrogenesis, and evolution of rocks of the earth's crust. *Prerequisite: one year of graduate study in SIO or consent of instructor.* (S/U grades permitted.) Hawkins, Macdougall (W)

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 ES 162A. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256L.* Castillo (W)

256L. Laboratory Exercises in Field Geology (2)
Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. Conjoined with ES 162L. *Prerequisites: consent of instructor; to be taken concurrently with SIO 256A.* Castillo (W)

257. Seminar in Petrology (4)
Discussion of current research in petrology and mineralogy. (S/U grades permitted.) Hawkins (W)

258A-B-C-D. Classics Seminar (1-4)
A discussion class usually held in conjunction with SIO 248A-B-C-D. Classic papers dealing with topics discussed in 248 will be read and discussed. Normally required of all first- and second-year students in geological sciences. (S/U grades only.) Staff (F,W,S)

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. Gieskes, R. Keeling (F)

261. Energetics and Kinetics in Marine Chemistry (4)
The consideration of seawater as an electrolyte solution with emphasis upon its structure and physical-chemical properties. Thermodynamic considerations of mixed electrolyte solutions with particular reference to seawater. *Prerequisite: Chem. 202A.* Gieskes, 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.) Faulkner, Fenical (F,W,S)

263. Major Chemical Cycles in the Sea (4)
The distribution of chemical species in the world oceans and their relation to physical and biological processes, with emphasis on transport and exchange. C. Keeling (S)

264. Solids in Nature (4)
Experimental and theoretical evaluation of geologically important properties of solids. Characteristic differences between solid types, electronic structure of solids, microscopic significance of thermodynamic concepts. Interaction between matter and radiation, structure of geologically important crystals and glasses, order and disorder. Band structure of solids, excited states, the dynamic of phase change. Conductivity, magnetic, and optical properties of solids with particular consideration of geological systems. *Prerequisite: consent of instructor.* Arrhenius (W)

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.* Faulkner, Fenical (W)

266. Geochemistry of Organic Compounds (4)
Distribution, sources, and stability of organic compounds in the geological environment. Major emphasis will be on the synthesis of organic compounds on the primitive earth; organic material in ancient rocks and sediments; and the cycle of organic material in the sea. *Prerequisite: organic chemistry; (biochemistry recommended).* Bada (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.) Staff (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.* Staff (W)

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.) Mullin (W)

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.* 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)

273. Professional Ethics in Science (2)
A seminar on the ethics and ethos of scientific research, based on published cases of unethical behavior. Given in alternate years. (S/U grades only.) Dayton, Mullin (W)

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 (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. *Prerequisites: consent of instructor; open to undergraduates.* (S/U grades permitted.) Dayton, Levin (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 (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.) Hessler (S)

278. Problems in Biological Oceanography (2)
Presentation of reports, review of literature, and discussion of current research in biological oceanography. Seminar. (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.* 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. Biology of the Higher Marine Vertebrates (3)
Introduction to evolution, classification, and major marine adaptations of marine reptiles, birds, and mammals. One lecture and laboratory each on reptiles and birds, the remainder on marine mammals (sea otter, sirenians, pinnipeds, and cetaceans). Laboratory sessions on identification and anatomy. *Prerequisite: graduate standing or consent of instructor.* DeMaster, Perrin, Rosenblatt (W)

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)

286. Critiques and Data Reanalyses (4)
A case-history approach to critical reading of scientific literature. Examples are drawn from reports on ecologically relevant behavior of marine animals; issues covered include tractability of the problem; design of the experiments; and re-examination of the evidence, with an emphasis on statistical analysis and alternative interpretations of the data. Offered alternate years. *Prerequisites: sound preparation in statistics; consent of instructor.* Enright (W)

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 Metabolism (4)
Biochemistry and physiology in relation to metabolic activities and elemental cycles; growth and death of bacteria. *Prerequisite: consent of instructor.* Alternate years. Staff (S)

288. Recent Advances in Invertebrate Zoology (4)
Lectures will cover marine invertebrates (exclusive of arthropods) phylum by phylum. After a brief review of fundamentals for each group, significant studies of the last five years or so will be covered. These works will cover mainly anatomy, physiology, comparative embryology, and macroevolution. *Prerequisite: graduate standing or consent of instructor.* (S/U grades permitted.) Holland (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.) Bullock (F)

293A-B. Animal Behavior (4-4)
(A) Ethological approach. Species characteristics behavior, its causation and adaptive significance. Controversies on "innateness," "drives," and related concepts. Ecology in relation to neurophysiology. (B) Control mechanisms: feedback and feed forward in elementary behaviors associated with orientation and assessment of environment; random processes describing the occurrence of behavioral patterns. *Prerequisites: basic knowledge of calculus and statistics recommended.* Staff (F,W)

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.* Rosenblatt (S)

295. Current Topics in Developmental Biology (4)
A collection of lectures with some periods devoted to observations of fertilization and embryogenesis. Various topics of current interest in developmental biology will be discussed. *Prerequisite: consent of instructor.* (S/U grades permitted.) Vacquier (F)

296. Special Topics in Marine Biology (1-4)
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)

Social Science

OFFICE: 1512 Galbraith Hall, Revelle College

Social Science 60 is an introduction to statistics which satisfies the statistics requirements in various departments. This course does not require mathematical preparation beyond high school intermediate algebra. The content of the course is oriented towards social science problems and the computer analysis of social science data.

COURSES

60. Elementary Statistics for the Social Sciences (4)
Introduction to the basic statistical analysis of social science data, including descriptive and inferential statistics. Included is a laboratory component involving the use of computer-based programs for statistical analysis. Credit not allowed for both Social Science 60 and Poli. Sci. 60, Psych. 60, Math. 10, Math. 13. (F,W,S),

Sociology

OFFICE: Social Sciences Building, Room 401

Professors

Rae Lesser Blumberg, Ph.D.
Harvey S. Goldman, Ph.D.
Bennetta Jules-Rosette, Ph.D.
Richard P. Madsen, Ph.D.
Timothy L. McDaniel, Ph.D., *Academic Senate Distinguished Teaching Award, Chair*
Hugh B. Mehan, Ph.D.
Chandra Mukerji, Ph.D.
David P. Phillips, Ph.D.
Andrew Scull, Ph.D.
Gershon Shafir, Ph.D.
Steven Shapin, Ph.D.
Carlos H. Waisman, Ph.D.

Associate Professors

Richard G. Biernacki, Ph.D.
Stephen E. Cornell, Ph.D.
Juan Diez Medrano, Ph.D.
Jeffrey Haydu, Ph.D.
Rebecca E. Klatch, Ph.D.
Martha Lampland, Ph.D.
Christena Turner, Ph.D.
Kathryn A. Woolard, Ph.D.
Leon Zamosc, Ph.D.

Assistant Professors

Lisa Catanzarite, Ph.D.
Maria Charles, Ph.D.
Steven Epstein, Ph.D.
Ivan T. Evans, Ph.D.
Ali Gheissari, D.Phil.
Akos Rona-Tas, Ph.D.
Ricardo D. Stanton-Salazar, Ph.D.

Adjunct Professors

Michael S. Schudson, Ph.D.
Mary L. Walshok, Ph.D.

Associate Adjunct Professor

Yen Espiritu, Ph.D.

Emeritus

Bennett M. Berger, Ph.D.
Aaron V. Cicourel, Ph.D.
Jack D. Douglas, Ph.D.
Joseph R. Gusfield, Ph.D.
Jacqueline P. Wiseman, Ph.D.

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, 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 sociology of time, comparative sex stratification, mass media, and revolutions. The faculty also teach an exceptional array of courses focusing on specific societies or world regions, including the Middle East, 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 three lower-division and twelve upper-division courses in sociology, including the required courses listed below, and a course in elementary statistics (Social Science 60).

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 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 Social Science 60 (Elementary Statistics for the Social Sciences) 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.

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, 101M, 102, 102T, 103F, 103T, 120
Methods
103M, 104, 105, 106, 107, 108A, 108B, 109, 109S

B. **Culture, Language, and Social Interaction**
(courses designated Soc/B)
111, 112, 113, 115, 116, 117, 118, 119, 120S, 131, 142, 143, 148L, 160, 162, 164J, 166, 167, 170, 172, 173, 174, 176, 177

C. **Organizations and Institutions**
(courses designated Soc/C)
121, 122, 123, 125, 126, 129, 130, 132, 135, 136A, 136B, 139, 140, 141, 144, 148, 148C, 148E, 148I, 148L, 150L, 151M, 152, 156, 157, 159, 165A/B, 168E, 168J, 168S, 168T, 175G, 180

D. **Comparative and Historical**
(courses designated Soc/D)
120W, 133, 151, 158, 158J, 169, 179, 181, 181I, 182, 183S, 184, 185, 186P, 187, 187S, 188A, 188B, 188D, 188E, 188F, 188G, 188H, 188I, 188J, 188K, 188L, 188M, 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 109S.) *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.

Writing Requirement

Writing skills, including the ability to define precise questions, marshal evidence, and present clear arguments, are indispensable for all students, whatever their academic and career interests. To help students develop these skills, the department asks all new (fall 1991 or later) majors to fulfill a writing requirement. One quarter prior to graduation, students must show the undergraduate coordinator (located in SSB 409) two substantial (ten or more pages) research papers written for courses in their major, for which they received a grade of C– or better. Ideally, this should take place the quarter before graduation when students come to the undergraduate coordinator to make certain they have met all major requirements. The two papers should be brought in at the same time. To give students ample opportunity to complete this requirement, most upper-division sociology classes will either assign a research paper or offer students the option of writing such a paper for course credit.

Regional Specialization Option

Many faculty members concentrate on particular societies or regions, and the department encourages students to do the same. Students who develop expertise on another country through a full year in the Education Abroad or Opportunity Abroad Programs may declare a

regional specialization as part of their sociology major. Courses taken abroad dealing with the history, culture, or politics of the host country may be used for the major, even if these courses are in other disciplines. In this way, students will be able to participate in EAP and OAP while still making normal progress towards finishing their major. Completion of the regional specialization will also be noted on the student's transcript. Students considering this option should discuss their plans with the faculty undergraduate adviser before going abroad, and courses taken through EAP or OAP must be approved by the department for use in the major. For more information on the regional specialization, see the undergraduate program coordinator or faculty adviser. For 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.

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 six sociology courses: two lower-division and four 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, or 40) and any four 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.

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

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. 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 June 1.

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 Department of Sociology at UCSD has long been recognized as a center of largely qualitative, field-based research. In recent years, it has greatly increased its strength in comparative and historical sociology and in quantitative methods of sociological research. Today members of the department are engaged in a wide variety of research and teaching activities, which fall largely into two broad areas of interest.

1. A number of 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 development, including the labor process, stratification and the organization of work, and the development of market economies, (3) collective identities and social relations, including nationalism, 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 Soviet Union and Russia, Japan, China, southern Africa, Latin America, various societies of the Middle East, as well as the United States.

2. Most faculty have research interests in the sociology of culture, broadly conceived. This includes culture and its institutions as a framework for studying society, social theory, politics, and meaning, as well as culture as the expression of social experience. Faculty research interests include political culture and the culture of work; sociology of the arts, literature, and film; popular culture, including the analysis of mass media and communication; sociolinguistics, including the study of medical discourse and reasoning, education, and socialization; and the sociology of intellectuals, of science, and of knowledge. A rapidly developing strength of the department is the analysis of the role of symbolic and cognitive dimensions of society in larger-scale social change and in collective identity and action.

Further, a number of faculty research areas clearly cross these sub-disciplinary divides, including areas like gender, race and ethnicity, and social theory.

In addition to the general sociology graduate curriculum, the department offers two distinctive programs of study which entering students may wish to consider: the Science Studies Program, and a Concentration in Comparative Institutional and Cultural Tranformation. (See the section on Specialized Programs of Study, below.)

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 12.0 units of graduate level courses each quarter, and to maintain a grade point average of 3.0 or better.

Programs of study are determined in consultation with the graduate advisor, who supervises the work of students until their doctoral committee has been established. In addition to the graduate advisor, first and second year students meet individually with a faculty mentor to review academic progress, establish a coherent program of study, set goals for orals papers, and deal on an informal basis with any difficulties.

Course requirements include the core sequence, taken in the first year, and nine elective seminars, at least seven of which must be in sociology, and one of which must be an advanced methods course.

The Core Curriculum Sequence

The first year of the program is devoted to a required sequence of core courses. Entering students go through the sequence as a cohort; as a consequence, all first-year students must enroll in the fall quarter of the first year.

The core curriculum, required of all graduate students, is designed to introduce students to:

1. major sociological theories
2. exemplary works of research undertaken to develop or test theories
3. sociological methods and techniques of research.

Three two-course sequences are required in the first year: Theory I and II, Sociological Analysis I and II, and Statistics I and II. Additionally, students must take a three-quarter sequence of one-unit classes, called Faculty Research Seminar I, II, and III.

The faculty orientation course introduces different faculty members and their research areas to the first-year students.

Assessment of Students in the First Year of the Program

At the end of the student's first year in the program, student performance is evaluated by a committee consisting of the graduate adviser and the faculty teaching the core sequences. 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.

Departmental Reviews

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. The committee will establish that the student is in good standing, recommend additional coursework, or recommend dismissal. The committee may wish to meet with some students in person to discuss their evaluation.

The Master's Degree

The department does not accept students for the M.A. degree alone. The M.A. degree is earned as one step toward the Ph.D., and is based on the quality of the student's work in the first two years in the graduate program. At the end of the second year, the Graduate Program Committee evaluates the student's progress, based on grades, yearly faculty evaluations, and on three seminar papers submitted by the student. All passing students receive the M.A. degree; M.A. Only students receive the degree but cannot continue toward the Ph.D.; those receiving Non-pass are asked to withdraw.

The Field Examination

Upon completion of the core curriculum and the nine 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. 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 two parts, one written, one oral. The written part consists of two papers, one in each field, and a course syllabus. The papers are critical reviews of the literature in that field, demonstrating 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. Field papers are limited to 40 pages each, exclusive of notes and bibliography. The bibliography in each field should include at least 20–30 books or article equivalents. The two bibliographies may not significantly overlap, either in literature surveyed or in specific titles. In addition to the two papers, the student must submit to the examining committee a syllabus for a general, upper-division course in one of the two fields.

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.

Following the oral examination, the committee grades the student, basing the grade on 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.

More detailed guidelines to the Field Examination are available from the Graduate Office in the Department of Sociology.

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. Committee members are chosen by the student and approved by the department chair. The student asks one of the department members to serve as chair. This composition of the committee may or may not overlap with the committee that carried out the Field Examination.

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 (1) specifies the dissertation research topic; (2) places it in the context of the relevant literature; (3) specifies its significance; (4) specifies and justifies the research methods to be used; (5) establishes the feasibility of the research; and (6) 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 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.

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, 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. 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.

Departmental Ph.D. Time Limit Policies

Students must be advanced to candidacy by the end of three years. Normative time is six years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

Specialized Programs of Study

Concentration in Comparative Institutional and Cultural Transformations

This concentration is a specialization within the standard graduate curriculum in sociology. The primary concerns of the Concentration are (1) the study of institutional change in contemporary and historical perspective, and (2) the study of gender, class, ethnic, national, transnational, and other collective identities. The relationship between institutional change and collective identity receives particular attention. The distinctive requirements of this concentration are noted in the Program of Study section below.

This concentration has its own set of requirements to be completed in addition to existing departmental requirements:

1. During their time in the program, students will take courses dealing with comparative economic institutions, comparative political institutions, and collective identities.
2. Two of the six elective seminars required by the sociology doctoral program must include intensive study of the history or culture of a particular country or group of countries.
3. Students attend a year-long, non-credit seminar, meeting three times per quarter, in which faculty and students present work in progress.
4. Students must demonstrate competence in a language other than English.
5. Students are expected to write doctoral dissertations dealing with changes in institutions and/or collective identities.
6. It is expected that most dissertations completed under this program will involve a field work or archival research component requiring at least six months of work in a setting other than the university.

Science Studies Program

The Graduate Program in Science Studies is a joint program of study bringing together fac-

ulty and students from the Departments of Sociology, History, and Philosophy .

Students in the program pursue a cross-disciplinary curriculum leading to dissertation research in the sociology of science, 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 scientific work.

The requirements of the Science Studies Program are substantially the same as for the standard graduate program in sociology; 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. A more detailed description of the Science Studies Program can be obtained by writing to: University of California, San Diego, Science Studies Program, 9500 Gilman Drive, Dept. 0104, La Jolla, CA 92093-0104.

For more information on the Program in Science Studies, see the coordinator in the Science Studies Office, H&SS 3045.

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 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 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.*

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 101M. Marxism (4)
This course examines the writings of Marx and Engels and developments in Marxist theory since Marx (e.g., Lenin and Gramsci). It will consider philosophical presuppositions and historical contexts as well as a variety of issues in political, social and economic theory. *Prerequisite: upper-division standing.*

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 102T. Introduction to the Sociology of Time (4)
The relevance of time in sociology, styles of interpreting topics such as collective memory, nostalgia, and the subjective structure of utopian ideologies; also a comparative introduction to different theories and traditions of spatio-temporal awareness in world civilizations. *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.*

Soc/A 103T. Special Topics in Theory (4)
Readings and discussion of particular theoretical issues in sociology. Topics will vary from year to year, depending on the current research of regular faculty or visiting faculty. Issues may include the study of a specific problem in social theory; the analysis of a particular theorist or school. *Prerequisite: upper-division standing.*

Soc/A 120. Mind, Self, and Society (4)
Freud's theory and its implications for the study of society. The first part of the course will focus on Freud's own theoretical project, examining first his theory of the mind; then his more comprehensive theory of personality and personality development; then his ventures into the analysis of culture, politics, and society. The second part will move on to consider the broader significance of his theory for understanding human nature and the social order; it may take into account subsequent developments in psychoanalysis, attempts by other thinkers to use and develop Freud's developments in psychoanalysis, attempts by other thinkers to use and develop Freud's ideas, alternative approaches, etc. *Prerequisite: upper-division standing.*

Methods

Soc/A 103M. Computer Applications to Data Management in Sociology (4)
The course aim is development of student skills in computer management and analysis of sociological data. This is pursued through practical experience with data produced by sociologically directed research. Students will be expected to develop competency in the analysis of such data sets, primarily by developing an extensive acquaintance with the MINI-TAB or SPSS-X statistical and data management language. *Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 104. Field Research: Methods of Participant Observation (4)
A basic course on the relations between sociological theory and field research. There is a strong emphasis on the theory and methods of participant observation, including a consideration of the problems of entry into field settings, recording observations, description and analysis of field data, and ethical problems in field work. Students will write a paper using these field methods. *Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 105. Ethnographic Film (6.0)
Ethnographic recording of field data in written and audiovisual formats. Critical assessment of ethnographies in terms of styles, format, and approaches. Midterm paper and final ethnographic videotape. *Prerequisite: Soc/L 1A, 1B, or consent of instructor. 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: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 107. Demographic Methods (4)
This course will teach students 1) how to measure and analyze mortality, fertility, and migration rates; 2) how these rates vary by sex, race, age, and marital status, etc.; and 3) some possible social explanations for these variations. *Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 108A. Survey Research Design (4)
This course covers the 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: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 108B. Quantitative Analysis of Survey Data (4)
This course examines the quantitative analysis of survey research data through computer-based student participation in the research process. Emphasis will be placed on index and scale construction and on univariate, bivariate, and multivariate types of analysis, including some standard descriptive and inferential statistics. *Prerequisite: upper-division standing. Will satisfy method requirement in Cluster A.*

Soc/A 109. Statistical Analysis of Sociological Data (4)
This course covers statistical inference, measures of association, sampling theory, and linear regression. The course also introduces students to the computer skills necessary for statistical analysis. *Prerequisite: Social Science 60 or consent of instructor. Will satisfy method requirement in 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.*

CLUSTER B: CULTURE, LANGUAGE, AND SOCIAL INTERACTION

Soc/B 111. Individual and Society (4)
This course will cover the classic controntation between the individual and the society, and its recent compression into social psychology. We will explore the historical change in this relation through the writings of nineteenth-century social philosophers, twentieth-century psychologists and sociologists, and several literary figures. *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 Interaction and Everyday Life (4)
This course will attempt to construct a science out of everyday life by examining its recurrent features. We will focus particularly on the vicissitudes of the individual's self, the subtleties of interpersonal interaction, and the group experiences of multiple realities. *Prerequisite: upper-division standing.*

Soc/B 115. Language and Society (4)
Explores relationships between forms of language and other aspects of social life focusing primarily on the United States. Emphasis on language and social identity, and language and power in everyday life and social institutions. *Prerequisite: upper-division standing.*

Soc/B 116. The Discourse of the Cold War (4)
This course focuses on the ways of speaking, acting and thinking about the role of nuclear weapons in the relations between the U.S., the USSR, and their allies since the end of WWII (the "Cold War"). The characteristics of strategic discourse are described and compared to other technical expert discourse. The discourse strategies of challenges to the strategic position and the various responses which those challenges have engendered are analyzed. *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 Sex and Gender Roles (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 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.

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 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 160. Sociology of Culture (4)
This course will examine the concept of culture, its "dis-integration" 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 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 164J. Persuasion and Society (4)
(Same as Com/Cul 174.) What is the role of messages intentionally designed to be persuasive in society? How are these messages crafted and what impact do they have? Topics will vary, but will typically include commercial advertising, public information campaigns, propaganda, public relations, and schooling. The course integrates research from sociology, social psychology, rhetoric, and communication. *Prerequisite: upper-division standing or consent of instructor.*

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 167. Intellectuals and Society (4)
Sociological analysis of the intelligentsia: types of intellectual theories concerning their social role; research on the social sources of intellectual work in politics, literature, art, and science; historical considerations of intellectual milieu; international comparisons of intellectuals. *Prerequisite: upper-division standing.*

Soc/B 170. Sociology of Fashion (4)
A sociological and historical inquiry into the role of fashion in Western civilization and contemporary America. Alternative sociological and social psychological theories of fashion will be presented with particular attention given to the cultural resources and psychological dispositions which help sustain the fashion impulse among modern peoples. *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. Visual Knowledge (4)
(Same as Com/Cul 160.) This course reviews ways that visual imagery contributes to our understanding of the world around us and ourselves. Students will consider uses of visual images in science, the mass media, and everyday life. *Prerequisite: Soc/L 1A or consent of instructor, or Com/Gen 20.*

Soc/B 174. Sociology of Literature (4)
Literature will be discussed in the context of the ideas of national and regional culture, "historical situations" 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.*

Soc/B 176. Material Culture: Design and Social Process (4)
(Same as Com/Cul 161.) 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: upper-division standing.*

Soc/B 177. Sociology of Drama (4)
This course will explore the sociological insights that can be obtained from reading examples of Western drama. Students will read selected examples of drama from ancient Greek tragedy to postmodernism. *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 122. Sociology of Organization (4)
This course examines the fundamental traits of modern organizations. Both formal and informal organizational structures are examined, with special emphasis on their macro-structural determinants as well as the behavior of people within those structures. *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 125. Minorities in the Schooling Process (4)
Using a survey format, the course will examine and critique various themes, principles, theories, and research concerning ethnic minorities in public education. The focus will be on Mexican-origin and African American students in public schools, grades K–12. *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 the family as an institution in modern and premodern societies. This course will begin with a study of the principles of kinship and then investigate the relationship of the family to social structure and social change. *Prerequisite: upper-division standing.*

Soc/C 130. Families and Communities in American Society: Cross-Cultural Forms (4)
A cross-ethnic examination of families currently living in enclaves and integrated communities in the United States. Emphasis placed on the contemporary strategies utilized by families and communities to cope with familial responsibilities, economic constraints, and societal pressures. *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 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 139. Social Stratification: Class, Gender, Race/Ethnicity (4)
Massive inequality in wealth, power, and prestige is everpresent 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 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 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 148C. Power, Culture, and Social Revolt (4)
This course will focus on the problem of how power is meaningfully constructed and contended by examining cases of social revolt and everyday resistance. Clarifying the concepts of hegemony and ideology will be a central concern of the course. *Prerequisite: upper-division standing.*

Soc/C 148E. Ethnicity, Nationalism, and Politics (4)
The sources and evolution of romantic nationalism, great power nationalism, fascism, national liberation, ethnic pride, and religious fundamentalist movements. We will focus on the recent upsurge of nationalist movements in the Soviet Union, Eastern Europe, the Middle East, but also in developed Western societies. *Prerequisite: upper-division standing.*

Soc/C 148I. Collective Identity and Group Formation (4)
Examines the genesis and transformation of collective identities, with particular emphasis on ethnicity. Topics include the political economy of group formation and classification, the relationship between culture and identity, and between identity and collective action. *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 148M. Labor Market Inequality in Los Angeles and the Border Region (4)
(Same as USP 136.) Focus on the changing labor force and occupational structure of Los Angeles and the Mexican border. We apply theoretical work to recent changes, with special attention to immigrant and minority employment, economic restructuring and changes in the international division of labor. *Prerequisite: upper-division standing or consent of instructor.*

Soc/C 150L. The Politics of Language and Ethnicity (4)
This courses examines language politics and ethnolinguistic conflicts from a comparative, sociolinguistic perspective. It considers the nature of language variation, of ethnicity, and of political action in case studies from North America, Europe, Asia, Africa, and/or Latin America. *Prerequisite: upper-division standing.*

Soc/C 151M. Chicanos in American Society (4)
Survey of contemporary sociological issues affecting Mexican-origin people in the United States. Lectures and reading will be oriented toward providing a greater understanding of how key institutions in society allocate opportunities and institutional resources to different social groups. *Prerequisite: upper-division standing.*

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 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)
(Same as Comm/SF 171 A-B; Poli. Sci. 102I A-B.) 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 168J. Scientific and Technological Controversies in Contemporary American Society (4)
The course will introduce the students to the basic tools of sociology of science and technology; how can science in ac-

tion be followed? How can scientific controversies be mapped and analyzed? How can we analyze the technical artifacts we live with? *Prerequisite: upper-division standing.*

Soc/C 168S. The Making of the Scientist (4)
A social, historical, and sociological survey of the development of the scientist's role from the Renaissance to the early twentieth century, assessing changing historical connections between scientists' views of nature and the status perceived value of the scientific role. *Prerequisite: upper-division standing.*

Soc/C 168T. Sociology of Technology (4)
This course introduces students to classic and recent sociological approaches to technology, giving special attention to the relations between technology and science, technology and the state, and technology and work. The course will concentrate on technologies of production and destruction, and links will be made between the sociology of technology and the sociology of scientific knowledge. *Prerequisite: upper-division standing.*

Soc/C 175G. 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. *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 120W. Gender and Development (4)
The purpose of this course is to examine the status of women in various parts of the world. Several cultures will be compared. Attention will be paid to the influence of cultural, sociopolitical, and economic factors on gender inequality. Women's roles in society, the community, and the family will be discussed. *Prerequisite: upper-division standing.*

Soc/D 133. Comparative Sex Stratification (4)
Utilizing a new theory of factors affecting female status, we examine topics including women in evolutionary perspective. Third World women and modernization; women's changing position in the USSR, Israeli kibbutz, and especially the United States and the political economy of sex stratification. *Prerequisite: upper-division standing.*

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 or consent of instructor.*

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 alternative views on the construction of the modern citizen and alternative views of society. *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 181I. The Sociology of Indian-White Relations (4)
Examines historical and contemporary relations between Native American societies and the United States. Pays particular attention to transformation in Indian collective identities, political power, and collective action, and to current political and economic issues. *Prerequisite: upper-division standing.*

Soc/D 182. Revolutions (4)
An historical and comparative analysis of a selected set of modern political revolutions. Review and criticism of social class interpretations of revolutions. The role of revolutions in redefining the moral terms of social life. *Prerequisite: upper-division standing.*

Soc/D 183S. Post-Communist Societies (4)
Theories of social transformation will be applied to the fundamental changes taking place in eastern Europe, the Soviet Union, China, and socialist countries in the Third World. Through comparing different countries, the course will discuss the causes and consequences of social, economic, and political change. *Prerequisite: upper-division standing.*

Soc/D 184. Societal Evolution and Economic Development (4)
This course will examine agricultural societies at different evolutionary levels of technological and societal complexity, ranging from hunting-gathering bands with incipient agriculture to traditional agrarian empires. We shall explore the impact of change, modernization, and the world economy on contemporary rural societies, especially Third World underdeveloped areas. *Prerequisite: upper-division standing.*

Soc/D 185. The Political Economy of Development and Underdevelopment (4)
This course reviews theories and definitions of development, traces the Industrial Revolution in the West and Japan, and analyzes how the colonialism and world economy fostered by the industrialist capitalist countries affected development of Third World nations. Finally, some alternate development paths pursued by underdeveloped countries are examined. *Prerequisite: upper-division standing.*

Soc/D 186P. Peasants and Farmers in Society (4)
Peasants are still a majority of the population in many developing areas of the world. With modernization, they have undergone processes of rapid transformation, taken part in social and national revolutions, and have become a target group in the developmental policies of state and international institutions. This course will explore conceptual issues in the economic and social characterization of the peasantry, the ways in which peasant groups are incorporated in broader societies, and some recent themes in peasant culture and political participation. *Prerequisite: upper-division standing.*

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 188E. Soviet Society (4)
Social change in the USSR since 1917. The attempt to create the world's first socialist society will be examined through a consideration of changing patterns of culture, politics, economics, and ethnic relations. *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, diaspora nationalism, etc. Zionism, one of these responses, will be examined in detail, to be followed up by an exploration of 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 188FL. Foreign Language Discussion Section (1)
Students will exercise advanced foreign language skills to discuss materials in the correspondingly numbered English language foreign area course. (Must be co-registered with parent course.)

Soc/D 188G. Policemen, Businessmen, and Students: Japanese Organizational Cultures (4)
This course examines Japanese cultural values and social relations in the context of contemporary organizations. The focus will be on the integration of individuals into organizations and on the integration of organizations into society. *Prerequisite: upper-division standing.*

Soc/D 188H. Middle Eastern Societies (4)
Modern Middle Eastern societies, nineteenth-century backgrounds, encounters with the West, reformism, twentieth-century power politics and reshaping the political geography of the region, impacts of modernization on the cultural climate of these societies, and the ideological composition of recent revivalist movements. *Prerequisite: upper-division standing.*

Soc/D 188I. Eastern European Societies (4)
This course focuses on Eastern European societies. The topics to be covered include the transition from feudalism to capitalism, the rise of the modern state, nationalism, ethnicity, leftist and rightist revolutionary movements, and the transition to socialism. *Prerequisite: upper-division standing.*

Soc/D 188J. Change in Modern South Africa (4)
Why does the authoritarian racial state in South Africa remain so resilient despite the growing commitment to transform it? The course portrays racial domination as a system of powerful but unstable interests rooted in South Africa's racially repressive labor market. *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 relations in its social relations, politics, and culture? Specific topics include class relations, race, religion, and social policy. *Prerequisite: upper-division standing.*

Soc/D 188L. State and Society in Modern Iran (4)
This course will study major aspects of political culture, institutions of authority, and sources of legitimacy in modern Iran. It will include reformist ideas of the 19th century Qajar society, the Constititional movement of the early 20th century, nationalism, the emergence and different stages of the Pahlavi state, 1978/79 revolution, and the Islamic Republic. *Prerequisite: upper-division standing.*

Soc/D 188M. Historical Sociology of the Middle East (4)
This course will be a comparative study of Middle Eastern societies in a long-term historical perspective. It will include topics such as political formations, administration of cities, relation with other societies, communities, trade and travel, professions and crafts, institutions of learning, and ideas. *Prerequisite: upper-division standing.*

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 190. Senior 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. *Prerequisite: senior standing.*

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 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 (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)
An analysis of major works in, or influencing, contemporary sociological theory in Europe and America.

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.

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.

Soc/G 205. Survey and Demographic 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 demographic data and some common ways in which these data are used incorrectly.

Soc/G 206. Survey and Demographic 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 demographic data and some common ways in which these data are used incorrectly.

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.

Soc/G 208A-B-C. Faculty Research Seminar I, II, and III (1-1-1)
An introduction for entering graduate students to the range and variety of research and scholarly interests 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 209A-B. Sociological Analysis (4-4)
Students are introduced to exemplary models of sociological research. Exemplars of participant observation, text and discourse analysis, and historical analysis will be the focus of attention. Issues in gathering materials, analyzing data, interpreting results, reporting findings will be discussed.

Soc/G 210. Sociology of Health and Illness (4)
A close-in examination of the effect of cultural, social structural and interactional factors in the diagnosis, treatment, and outcome of illness experiences in contemporary society. Class discussions are organized around a series of readings designed to parallel the phases of the natural history of an illness.

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 life-styles, culture, and deviance.

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. In the first half of the course, the class will discuss a range of selected readings devoted to the role of class, gender, politics, and language in popular culture. In the second half, the class will read a set of books from anthropology, literature, psychology, history, and American studies that help to illustrate the broad interdisciplinary nature of popular culture studies.

Soc/G 215. Sociology of Law (4)
This seminar examines the legal institutions in their social context. The course will include the following topics, two of which will be studied intensively: legal reasoning and crucial legal studies; dispute resolution; courtroom processes of adjudication; police and law enforcement; deterrence studies; law as an instrument of social change; symbolic properties of law.

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 218. Sociology of Organizations (4)
An examination of sociological theories of organizational structure and functioning. Critical attention to theories and ideologies of management in bureaucratic organizations. The historical and structural context within which bureaucratic modes of organization emerge and flourish.

Soc/G 221. Current Perspectives on the Sociology and Philosophy of Science (4)
This graduate seminar will systematically address the two related and symmetric questions: how can we label in philosophical terms the various brands of modern sociologies of science? How can we empirically define in sociological terms the various schools of contemporary philosophy of science?

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.

Soc/G 223. Identity and Action (4)
This seminar is about collective identity and the role it plays in collective action. Central topics include processes of group formation; the dynamics of collective identity; culture and identity; collective memory. Readings include both theoretical and case materials. *Prerequisite: graduate standing.*

Soc/G 224. Sociology of Development (4)
Analysis of the interplay among economic, political, social, and cultural forms of modernization, especially in societies that have been going through early phases of industrialization in the post-World War II era.

Soc/G 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/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.

Soc/G 227. Ethnographic Film (6)
Ethnographic recording of field data in written and audiovisual formats. Critical assessment of ethnographies in terms of styles, formats, and approaches. *Prerequisites: graduate standing/Soc/L 1A, 1B or consent of instructor.*

Soc/G 228. Culture and Consciousness (4)
This course examines recent literature which approaches culture and consciousness as social processes. We will look in particular at social action, sensibility, and agency in the context of specific institutions and practices of daily life. *Prerequisite: graduate standing.*

Soc/G 229. Gender and Science (4)
Gender has long been a central concern of scientific inquiry. The course addresses how gender ideologies, practices, and identities have been shaped by scientific communities, and how the work of scientists has been structured by these same concerns. *Prerequisite: graduate standing.*

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 interaction, and contrasting folk and specialized theories. *Prerequisites: completion of core and consent of instructor.*

Soc/G 235. Communism (4)
This course will examine the ideological framework of communism and historical attempts to realize its ideal goals. The experiences of the Soviet Union and other communist societies will be discussed, with attention to issues such as change in communist systems, varieties of communism, the role of ideology, and economic and political reform.

Soc/G 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. This course may be repeated for credit.

Soc/G 237. Historical Sociology of Science (4)
A critical survey of recent literature in the historical sociology of scientific knowledge, with special reference to the understanding of scientific practice and the social construction of scientific knowledge in particular social settings.

Soc/G 238. Survey of the Sociology of Scientific Knowledge (4)
An introduction to enduring topics in the sociology of scientific knowledge and to resources for addressing them. Attention is drawn to problems of accounting for scientific order and change recurrent debates over proper method for sociological accounts of science.

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.

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.

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 248. Latin American Societies: Social Classes and State Policies in a Comparative Perspective (4)
(Same as IP/GEN 474.) Focuses on class structures, political mobilization, and government policies (economic and social policies in particular) in selected South American countries. Special attention will be given to the interaction between domestic and external economic and political processes. *Prerequisite: graduate standing.*

Soc/G 251. The Politics of Representation (4)
We examine how power is expressed through discourse, including situations in which significant contests over the meaning of events have been waged, the discourse strategies used to achieve the preferred definition of such situations, and the conventions which emerge from these contests.

Soc/G 255A. Introduction to Science Studies (4)
(Same as Phil. 209A and HIGR 238.) 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 and HIGR 239.) 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 and HIGR 240.) 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 256. Ethnographic Research and the Study of Science (4)
In this course, graduate students can learn field methods through group research on scientific practice. Students will be trained in techniques for making observations, conducting interviews, using diaries, maps and inventories, checking these data against archival sources.

Soc/G 260. Sociology of Religion (4)
The seminar will examine in detail one or two major issues in the anthropology of religion, as for example a theoretical problem like secularization and social change or a more substantive one like shamanism. Students will be notified in advance regarding the seminar topic.

Soc/G 261. Nationalism and Its Discontents (4)
The rise and spread of nationalist movements, their precondi-

tions, carrier groups, and ideologies from the French Revolution through the disintegration of the USSR. A survey of the major theoretical frameworks and an examination of their blind spots and exaggerations. *Prerequisite: graduate standing.*

Soc/G 262. Comparative Labor History and Labor Movements (4)
The growing number of outstanding case studies of working-class social history invites comparative analysis. This seminar considers some of the exemplary works on labor in England, France, and the United States; through discussion, we will also use these works to develop a comparative perspective on working-class history and organized labor.

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. *Prerequisite: graduate standing in sociology.*

Soc/G 265. Comparative Social Policy (4)
(Same as IP/Gen 453/253.) A macrosociological perspective with an empirical focus on social security, health, welfare, and labor market policies. Examines different national contexts to understand the variety of policy forms, factors that support alternative policy choices, and the role of both public and private sectors. *Prerequisite: graduate standing or consent of instructor.*

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.*

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 out-

look, 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.

Soc/G 272. Sociology of Language and Culture (4)
Examination of different models of the relationship among social, cultural, and linguistic structures. Focus on selected problems, e.g., language ideology, discursive construction of social relations; language in institutions of power, gender or ethnic relations; intercultural communication. *Prerequisite: graduate standing.*

Soc/G 275. Computer Analysis of Large Data Sets (4)
Students will learn skills needed to create, modify, store, transmit, and analyze large data sets on mainframe and on personal computers. UNIX, DOS, and SPSS-X will be emphasized, with other computer skills taught as needed.

Soc/G 276. Theories of Social Transformation (4)
The course surveys comparative theories of large-scale, historical transformations and the role of human agency in epochal change. Substantive issues examined include transitions to a market economy, the emergence of democracy, the demise of racial states, the collapse of communist regimes, and the fall of authoritarian dictatorships. *Prerequisite: graduate standing.*

Soc/G 280. Sociological Writing (4)
This seminar involves (1) reading and discussion on how to write sociology with clarity, precision, and rhetorical force, and (2) close, line-by-line criticism and editing of student papers. At the beginning of the quarter, each student must submit a paper he or she has recently written. At the end of the quarter, it will have been re-written in light of the discussion of it in the seminar.

Soc/G 281. Theories of Social Change (4)
Social change has been a central concern of sociological theory. Until recently much of our understanding of social change relied on notions derived from the rise of modernity. This course reexamines social change in the light of recent historical transformations. *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 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.)

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.)

Soc/G 299. Thesis Research (1-12)
Open to graduate students engaged in thesis research. (S/U grades only.)

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.)

Space Science and Engineering

OFFICE: 1512 Galbraith Hall, Revelle College

The space science and engineering minor is a focused set of six upper-division courses open to students with junior standing in one of the following departments: AMES, 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 (AMES 144A) and Space Engineering (AMES 144B), plus four electives to be chosen from a list of courses with the approval of an adviser. The present list of electives includes:

AMES 137, Aerospace Structural Design

Chem. 170, Cosmochemistry

ECE 120, Solar System Physics

ECE 146C, Microwave Systems and Circuits (extensive prerequisites, lab component)

Physics 160, Stellar Astrophysics

Physics 161, Galaxy and Interstellar Medium

Physics 162, Galaxies and Cosmology

Spanish Literature

See Literature.

Subject A

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 towards graduation requirements; however, the course units do count as workload credit towards 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 (619) 534-6177.

Teacher Education Program

OFFICE: Building 517A, Roosevelt College

Professors

Michael Cole, Ph.D., *Professor of Psychology and Communication*
Hugh Mehan, Ph.D., *Professor of Sociology, Program Coordinator*

Associate Professors

Barbara Tomlinson, Ph.D., *Associate Professor of Literature*
Kathryn A. Woolard, Ph.D., *Associate Professor of Sociology*

Assistant Professors

Ricardo Stanton Salazar, Ph.D., *Assistant Professor of Sociology*
Olga Vasquez, Ph.D., *Assistant Professor of Communication*

Lecturers SOE

Tom Humphries, Ph.D., *Lecturer, Teacher Education*
Paula F. Levin, Ph.D., *Graduate Adviser and Lecturer, Teacher Education*
Randall Souviney, Ph.D., *Associate Coordinator, Senior Lecturer, Teacher Education*

Lecturers

Bobbie Allen, M.A., *Lecturer, Supervisor, Teacher Education*
Joan Commons, M.A., *Lecturer, Supervisor, Teacher Education*
Winfield Cooper, M.A., *Lecturer, Supervisor, Teacher Education*
Gerald DiCarlo, Ph.D., *Interim Director, OASIS; Lecturer, Teacher Education*
Cheryl Forbes, M.A., *Lecturer, Supervisor, Teacher Education*
Beatrice Pita, Ph.D., *Lecturer, Literature*
José Alfonso Smith, M.S., *Lecturer, Supervisor, Teacher Education*
Daryl Stermon, M.A., *Lecturer, Supervisor, Teacher Education*
Irene Villanueva, Ph.D., *Lecturer, Supervisor, Teacher Education*

The Teacher Education Program (TEP) at UCSD offers the California Multiple Subject Teaching Credential for elementary school teachers, the Single Subject Credential in english, mathematics, physical and life sciences for secondary school teachers, the Master of Arts in teaching and learning and a minor in education. All TEP credentials have the Cross-cultural, Language and Academic Development (CLAD) emphasis, and the option of the Bilingual Cross-cultural, Language and Academic Development (BCLAD) in Spanish.

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.

Teacher candidates in both the Multiple Subject and Single Subject credential programs can complete a preliminary and a professional clear credential at UCSD.

[redacted]

The admissions process for the Multiple Subject and Single Subject Credential programs is similar: (1) Students complete the prerequisites to the credential program and (2) students apply for admission to the Professional Preparation component of the credential program. The application deadline for the Multiple Subject and Single Subject Credential Programs is **April 1**, to start work in the following academic year.

Applicants interested in financial aid should apply as soon as possible, preferably by February 15, and contact Student Financial Services at (619) 534-3807.

Each applicant is carefully reviewed for admission by a committee composed of faculty and local public school educators, including TEP graduates. 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 in an instruction packet available from the TEP office. Students are encouraged to contact TEP as soon as they are interested in pursuing a teaching career.

[redacted]

Prerequisites

The Multiple Subject Credential Program prepares students to teach in grades K through 6 in California public schools. Before admission to the Multiple Subject Credential Teaching Program, students must complete the following requirements.

Bachelors Degree

A B.A. or B.S. from UCSD or a B.A. or B.S. from another University of California campus, or a B.A. or B.S. from another university with a major field of study equivalent to one offered at UCSD is required. Some majors are *not* acceptable, including business, education, liberal studies, marketing and recreation. A 3.0 cumulative GPA is required.

Subject Matter Preparation

This requirement is satisfied by *either* (a) passing the Multiple Subject Assessment for Teachers (MSAT) test *or* (b) completing the subject matter program for the multiple subject credential (Please contact the TEP office for more information about the subject matter program).

The California Basic Skills Test (CBEST)

This requirement is satisfied by passing the CBEST. Contact the TEP office for information about test dates.

U.S. Constitution Requirement

This requirement is satisfied by *either* (a) completing a course studying the provisions and principles of the U.S. Constitution *or* (b) passing the U.S. Constitution Exam offered through University Extension or the County Office of Education. (Contact the TEP office for information about test dates).

Educational Foundations Courses

Students must complete the following courses with grades of B or higher:

Practicum in Learning. TEP 128 A-B-C *(Practicum in Learning)*. TEP 130 (Public Service: *Practicum in Learning)* may substitute for TEP 128A with instructor approval.

Child Development. *One* of the following courses or its equivalent: TEP 115 *(Child Development and Education)*, TEP 114 *(Cognitive Development and Interactive Computing Environments)*, HDP 1 *(Introduction to Human Development)*, Com/HIP 116 *(Practicum in Child Development)*, Psychology 7 *(General Psychology: Developmental Psychology)*, Psychology 101 *(Introduction to Developmental Psychology)*, *or* TEP 116 *(The Psychology of Teaching and Structure of Information for Human Learning)*. TEP 115 is recommended.

Language and Culture. *One* of the following courses or its equivalent: Soc./TEP 117 *(Language, Culture, and Education), or* Com/HIP 122A or 122B *(Communication and the Community), or* Com/HIP 114 (Bilingual Communication).

The Social Organization of Schools. *One* of the following courses or its equivalent: Soc./TEP 126 *(Social Organization of Education) or* TEP 125 *(History, Politics and Theory of Bilingual Education), or* Soc. 125 *(Minorities in the Schooling Process) or* Soc. 150L *(The Politics of Language and Ethnicity)*. (BCLAD students must take TEP 125.)

Sensitivity to Second Language Learning and Acquisition

This requirement can be fulfilled by *either* (a) completing nine quarter units of course work at the college level (or equivalent) in a language which is not the applicant's native language *or* (b) demonstrating an equivalent experience in a second language situation. "Equivalent experience" is defined as a prolonged period in which the applicant lived in a country where the language spoken was not native and where the applicant was continuously required to speak that language (e.g. the Peace Corps), an extended experience in the applicant's native country where she/he was immersed in a multilingual community or the applicant was raised as a native speaker in a multilingual community. (Contact the TEP office for more information).

Additional Prerequisites for the BCLAD Emphasis in Spanish

The BCLAD Emphasis Credential is designed for students who can teach in Spanish and English. In addition to the requirements for admission to the CLAD credential described above, students interested in applying for admission to the BCLAD program must demonstrate:

Spanish Language Fluency: This requirement is satisfied by (a) completing two Spanish literature courses, at least one of which must be upper division in either Latin American or Chicano literature and b) completing the Spanish Language Assessment with an FSI score of at least 3. (Contact TEP in January prior to your application to schedule this test).

Cultural Knowledge. This requirement is satisfied by completing one history course and one culture course about Chicano or Latin American topics.

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.

The professional preparation courses are:

TEP 150: *Multicultural Education*

TEP 151: *Teaching the English Language Learner*

TEP 161 ABC: *Innovative Instructional Practices*

Pre-Student Teaching is offered in fall as TEP 190 (3.0 units). Student Teaching is offered in winter and spring quarters as TEP 169A, 169B (9.0-9.0 units)*(Practicum in Student Teaching)*.

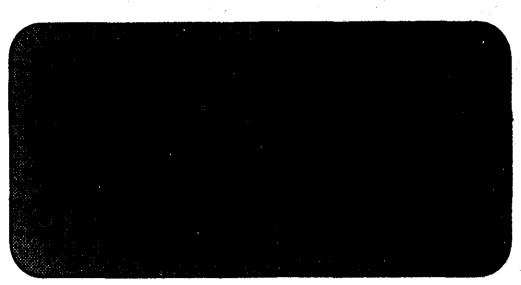
Additional Requirements for BCLAD Candidates

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 Multiple Subject Credential

FALL	WINTER	SPRING
TEP 150 (4)	TEP 161B (6)	TEP 161C (2)
TEP 151 (4)	TEP 169A (9)	TEP 169B (9)
TEP 161A (6)		
TEP 190 (3)		
BCLAD candidates:		
TEP 152A (2)	TEP 152B (2)	



Prerequisites

Before admission to the professional preparation component, students must complete the following requirements:

Bachelor's Degree

B.A. or B.S. with a major field of study in the area corresponding to the credential subject:

English: majors equivalent to UCSD literature or linguistics majors; all English majors.

Mathematics: all mathematics majors; majors equivalent to any UCSD engineering major or computer science major.

Physical or Life Science: all majors in the natural sciences.

A 3.0 cumulative GPA is required.

Subject Matter Preparation

This requirement is satisfied by *either* (a) completing the appropriate sections of the PRAXIS National Teachers Exam Specialty Area exam and the Single Subject Assessments for Teaching Exam Specialty Area *or* b) completing the subject matter preparation program for the appropriate single subject credential (contact the TEP office for course lists for the subject matter programs).

The California Basic Skills Test (CBEST)

This requirement is satisfied by passing the CBEST. Contact the TEP office for more information.

U.S. Constitution Requirement

This requirement is satisfied by *either* (a) completing a course which covers the provisions and principles of the U.S. Constitution *or* (b) passing the U.S. Constitution Exam offered through University Extension or the County Office of Education. (Contact the TEP office for information about test dates and course lists).

Educational Foundations Courses

Students must complete the following courses with grades of B or higher:

Practicum in Learning. TEP 129 A-B-C *(Practicum in Learning)*. (Enrollment in TEP 129C is limited to those students concurrently applying to the Internship Program.)

Teaching and Learning. *One* of the following courses or its equivalent: TEP 116 *(The Psychology of Teaching and Structure of Information for Human Learning)* [TEP 116 should be taken concurrently with either TEP 129A, B or C.], *or* TEP 114 *(Cognitive Development and Interactive Computing Environments)*, TEP 115 *(Child Development and Education)*, Com/HIP 116 *(Practicum in Child Development)*, Human Development Program 1 *(Introduction to Human Development)*, Psychology 7 *(General Psychology: Developmental Psychology), or* Psychology 101 *(Introduction to Developmental Psychology)*. TEP 116 is recommended.

Language and Culture. *One* of the following courses or its equivalent: Soc./TEP 117 *(Language, Culture and Education) or* Com/HIP 122A *or* 122B *(Communication and the Community) or* Com/HIP 114 *(Bilingual Communication)*.

The Social Organization of Schooling. *One* of the following courses or its equivalent: Soc./TEP 126 *(Social Organization of Education) or* TEP 125 *(History, Politics and Theory of Bilingual Education), or* Soc. 125 (M*inorities in the Schooling Process) or* Soc./C 150L (*The Politics of Language and Ethnicity)*. (BCLAD students must take TEP 125.)

Teaching Practices for Equitable Education. TEP 153. (Take concurrently with TEP 129C.)

Sensitivity to Second Language Learning and Acquisition

This requirement can be fulfilled by either (a) completing nine quarter units of course work at the college level (or equivalent) in a language which is not the applicant's native language or (b) demonstrating an equivalent experience in a second language situation. "Equivalent experience" is defined as a prolonged period in which the applicant lived in a country where the language spoken was not native and where the applicant was continuously required to speak that language (e.g. the Peace Corps), an extended experience in the applicant's native country where she/he was immersed in a multilingual community or the applicant was raised as a native speaker in a multilingual community. (Contact the TEP office for more information).

Additional Prerequisites for the BCLAD Emphasis in Spanish

The BCLAD Emphasis Credential is designed for students who can teach in Spanish and English. In addition to the requirements for admission to the CLAD credential described above, students interested in applying for admission to the BCLAD program must demonstrate:

Spanish Language Fluency: This requirement is satisfied by (a) completing two Spanish literature courses, at least one of which must be upper division in either Latin American or Chicano literature and b) completing the Spanish Language Assessment with an FSI score of at least 3. (Contact TEP in January prior to your application to schedule this test).

Cultural Knowledge. This requirement is satisfied by completing one history course and one culture course about Chicano or Latin American topics.

Professional Preparation

The professional preparation component of the Single Subject Programs consists of four courses and one academic year of teaching in public school classrooms.

Internship and Student Teaching Programs

Those admitted to the 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, or science 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.

The professional preparation program for the Single Subject Credential consists of the following four courses (BCLAD—five courses), in addition to TEP 179ABC (8-8-8 units) *Internship Field Experience*, for a total of 40 quarter units (BCLAD—44 units).

TEP 150	Multicultural Education
TEP 151	Teaching the English Language Learner
TEP 173*	Secondary English Teaching Practices
TEP 174*	Secondary Mathematics Teaching Practices
TEP 175*	Secondary Science Teaching Practices
TEP 176	Writing, Reading and Language Instruction

*Students may only take TEP 173, or 174 or 175.

A typical student schedule for the Single Subject Professional Preparation Program is shown in Table 2.

Table 2: The Professional Preparation Program for the Single Subject Credential

SUMMER	FALL	WINTER	SPRING
TEP 173 (4) (or 174 or 175)	TEP 151 (4) TEP 176 (4) TEP 179A (8)	TEP 179B (8)	TEP 179C (8)
For BCLAD Candidates:			
TEP 152A (2)	TEP 152B (2)		

Professional Clear Credentials

Completing the professional preparation sequence in Multiple or Single Subject described above entitles a teacher to teach in public schools in California for five years with a "Preliminary" credential. To teach past this time, teachers must complete additional courses, which lead to the award of a "Professional Clear" credential. Students may take this course work while they are completing the requirements for the "Preliminary" credential.

The courses required for the "Professional Clear" credential are:

TEP 180: *Computer Applications in Teaching and Learning*

TEP 181: *Health Education*

TEP 182: *Inclusive Educational Practices*

Undergraduate Minor

The Teacher Education Program offers a *Minor in Teacher Education*, which students fulfill with one of the two following courses of study.

1. *The Education Foundations Sequence* is required of all students who wish to apply for admission to the graduate credential program at UCSD, and is described above.
2. *The Cultural Context of Teaching and Learning Sequence* is intended for students who are not applying to the graduate credential program at UCSD. Courses are focused on the following two areas:
   a. Teaching and Learning (at least three courses)

      Three (or more) courses from the "Education Foundations Sequence" above. Other TEP courses may be approved by the TEP office.

   b. Cultural Context (no more than three courses)

      Courses to be included in this section focus on issues of difference, discrimination, or equity along lines of gender, ethnicity, physical attributes, sexual orientation, etc. Students develop their own course of study with the assistance of a TEP adviser. Suggested departments to review for course offerings are: ARTS—Music, Theater, Visual Arts; HUMANITIES—History, Literature, Philosophy; SOCIAL SCIENCES—Anthropology, Communication, Ethnic Studies, Political Science, and Sociology.

The Master of Arts in Teaching and Learning

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 instruction; the place of mathematics in middle school physics; writing revision among emergent writers; ecology project participation in the upper elementary grades; activities which link home and school experiences in the content areas of reading and writing, mathematics, science and social studies; improvement of the integration of curriculum and assessment; motivation and art; and embedding ESL in native-language instruction.

Since the program's inception six years ago, eighty-one students have earned M.A. degrees in teaching and learning with an emphasis in curriculum design. Of these, fifty-two came from the ranks of elementary teachers, twenty-seven worked as secondary teachers, and two taught at the post-secondary level.

The M.A. Course of Study

The M.A. program requirements consist of 40 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 pm. Core course work comprises twenty-eight units, with the remaining twelve units consisting of elective course work. Up to eight quarter units of non-methods post baccalaureate work in education may be transferred via petition toward the elective course requirements.

First Summer (early July–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 290

Introductory course to research on teaching practice.

Fall, Winter, and Spring:

TEP 230ABC

Three-quarter seminar providing an extensive overview of curriculum design principles, and application of educational research to classroom practice.

TEP 233AB

Graduate seminar series in which UCSD faculty present their research on educational topics. (Fall, Winter only)

Second Summer (early July–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.

Applications are available from the Teacher Education Program office (619-534-1680) in January, and are due March 1 prior to the summer for which you are seeking admission.

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.

LOWER-DIVISION

Human Development Program (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.

Psychology 7. General Psychology: Developmental Psychology (4)
This course is an introduction to the cognitive and social changes that take place over the course of a lifetime. This course introduces influential theories of child development, such as those of Freud and Piaget, together with recent criticisms of those theories.

UPPER-DIVISION

Com/HIP 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: Com/HIP 100 or consent of instructor.*

Com/HIP 116. Practicum in Child Development (6)
Combined lecture-laboratory course for students in Psychology and Communication. Students will spend three hours per week in lecture, six hours per week in field settings where they work with children, five hours per week reading, and four hours per week lab prep time. *Prerequisite: upper-division standing.*

Com/HIP 122A-B. Communication and the Community (4-4)
This course will prepare students to conduct research in a variety of community settings on the institutional and media-derived patterns of communication that affect people's everyday lives. *Prerequisite: Com/HIP 100 or consent of instructor.* (W,S) Staff

Psychology 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: Psych. 60.*

Soc/C 125. Minorities in the Schooling Process (4)
Using a survey format, the course will examine and critique various themes, principles, theories, and research concerning ethnic minorities in public education. The focus will be on Mexican-origin and African-American students in public schools, grades K–12. *Prerequisite: upper-division standing.*

Soc/C 150L. The Politics of Language and Ethnicity/c (4)
Examines ethnolinguistic conflicts and language policies, comparing cases internationally. Addresses interpersonal as well as macrosocial politics, and emphasizes the relationship of policy to actual language use. Topics include nature of language variations and of ethnicity.

TEP 109. Fitness for Future Teachers (4)
An activity course that presents resource ideas, in physical fitness, for future elementary teachers. Students will learn the principles of physical fitness, how to apply these principles, and how to develop activity programs for elementary school children.

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. Child Development and Education (4)
This course introduces prospective teachers to the cognitive, social and emotional development of children, including developmental learning theory, the teaching/learning process, maturation, and cross-cultural variation in development. Implications for classroom practice are drawn. *Prerequisite: approval of instructor.* (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. The course is not 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)
The mutual influence of language, culture, and education. Explanations of students' school success and failure that employ linguistic and cultural variables, bilingualism, and cultural transmission through education are explored. (F,W,Su)

TEP 124. Political Philosophy in Education: Freedom, Equality and Democracy (4)
Introduction to topics in political philosophy around issues of freedom, equality and democracy; classical theories applied to modern social and political scenarios in these three areas. Course applicable to expanding social studies content in elementary and secondary education. (Su)

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. (S)

TEP 126. Social Organization of Education (4)
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. (W,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 128A-B-C. Practicum in Learning (4-4-4)
Students are assigned as classroom teaching assistants (CTAs) in San Diego county public elementary schools. Concurrent course work concerns theories of teaching and learning, multicultural education, and the community context of learning. TEP 128A emphasizes the community context; TEP 128B emphasizes the social organization of schools; and TEP 128C emphasizes the teaching-learning process. *Prerequisite: department stamp required.* (F,W,S)

TEP 129A-B-C. Pre-Internship Practicum in Learning (4-4-4)
This course series focuses on the teaching/learning process in secondary school. UCSD students are assigned to tutor students and perform other classroom duties under the supervision of participating teachers in local schools. The UCSD student will provide instruction in science and mathematics a minimum of 40 hours per quarter. Weekly lectures on theories of learning, classroom observation, and the social organization of public schools are also required. *Prerequisites: department stamp and instructor's signature for TEP 129ABC. Must have successfully completed 129A for 129B, and 129A-B for 129C.* (F,W,S)

TEP 130. Public Service: Practicum in Learning (4)
The relationship between teaching and learning; the relationship between school and community; social and political organization of the schools; philosophical, sociological and political issues which relate to the U. S.. educational system, and the academic achievement of children are examined. Field and academic work focus on culturally diverse children in San Diego schools. *Prerequisite: department stamp required.* (F,W,S)

TEP 131A-B-C. Practicum in Public Service (2-2-2)
Students in this course will be placed in local schools to serve as mentors to culturally and linguistically diverse students. The field experience and seminar will emphasize the mentor/child relationship, teaching and learning process, and community service. Students will complete a minimum of 40 hours of field work, actively participate in a weekly seminar, write a weekly classroom journal, and cooperatively plan and present a school-based project with their assigned child at a university sponsored community event. *Prerequisites: TEP 130 and department stamp required.* (F,W,S)

TEP 150. Multicultural Education (4)
The purpose of this course is to help prospective elementary and secondary teachers organize their classrooms to make education equitable for all students. Ways to utilize the talents and skills that students from diverse cultural backgrounds bring

to school as resources for classroom instruction will be suggested. The discussion will be organized along three dimensions: (1) the ecology or environment of the classroom, (2) the discourse of the classroom, and (3) curriculum content. Included in the ecological category are such issues as grouping, seating arrangements, and visual displays. Included in the discourse category are teachers' instructional strategies, turn-taking procedures and non-verbal cues. Included in the curricular content category are issues of inclusion/exclusion, perspective, and relevance in math and science. *Prerequisite: TE79 or TE80 major code.* (F)

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: TE79 or TE80 major code.* (F,W)

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: TE79 or TE80 major code.* (Su,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: TE79 or TE80 major code.* (F,W)

TEP 153. Teaching Practices for Equitable Education (2)
The purpose of this course is to help prospective secondary teachers organize their classrooms to make education equitable for all students. Successful practices that have enabled all students to achieve to the best of their abilities will be discussed. *Prerequisite: concurrent enrollment in TEP 129C or instructor consent.* (S)

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: TE79 major code.* (F)

TEP 161B. Innovative Instructional Practices (6)
Second course in a three course sequence. It provides pedagogical methods for multiple subject teaching. Diverse subject areas (language arts and English-as-a-second-language) are integrated into a single intercurricular course of study by emphasizing activity/inquiry techniques of instruction. *Prerequisites: TEP 161A and TE79 major code.* (W)

TEP 161C. Innovative Instructional Practices (2)
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 and TE79 major code.* (S)

TEP 169A-B. Practicum in Student Teaching (9-9)
Credential candidates student teach in participating schools under the supervision of cooperating teachers. The practicum provides practical experience and diversified responsibilities. *Prerequisite: TE79 major code.* (W,S)

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: TE80 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: 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: affirmed credential candidate 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: TE79 or TE80 major code.* (F)

TEP 179A-B-C. Internship Field Experience (8-8-8)
Each candidate works for a period of one year under the guidance of an on-site teacher and university supervisor. The internship offers the prospective teacher extensive experience organizing and implementing lessons under actual classroom conditions. *Prerequisite: affirmed credential candidate or approval of instructor; TE80 major code.* (F,W,S)

TEP 180. Computer Applications in Teaching and Learning (4)
Microcomputers are viewed as a component of interactive communication media. Students learn to use microcomputers and computer networks in course work through hands-on experience. The possible impact of these new media on the teaching-learning process is explored. The course assumes a basic familiarity with social science concepts and the logic of social science inquiry. *Prerequisite: upper-division standing or consent of instructor.* (F,S,Su)

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: TE79 or TE80 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: TE79 or TE80 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)

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 (4)
Advanced TEP students are prepared in effective methods of supervising the preparation of UCSD students serving as paraprofessionals in elementary school classrooms. Topics covered include: classroom management, interpersonal relations, supervision techniques, multicultural 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

Lit/Writing 272. Research on Composition and Written Discourse (4)
This course will survey current research on composing and written discourse and direct students in research projects involving the analysis of writing. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process. *Prerequisite: consent of instructor.*

Lit/Writing 273. Practicum on Research in Composing and Written Discourse (4)
In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

Psychology 211. Piagetian Theory (3)
Seminar on selected topics in Piaget's theory of cognitive development. *Prerequisite: consent of instructor.*

Psychology 216. Basic Seminar in Comparative Cognitive Research (4)
This seminar will review current research and theory in cognitive psychology in order to characterize group differences in cognitive functioning.

Psychology 259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)
An examination of the major theories and relevant data concerning the way in which culturally organized experience influences the nature of thinking. Particular attention will be paid to understanding the presumed relations between culture and thought.

Sociology 241. Cognitive and Linguistic Aspects of Social Structure (4)
Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organizational structures.

Sociology 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4-4)
An advanced seminar dealing with field and quasi-experimental methods for studying discourse and textual materials. Students are expected to conduct their own field research in natural or organizational settings.

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.

Sociology 271. Seminar in Classroom Interaction (4)
Sociolinguistic principles are applied to the study of classroom interaction. Research methods, including media methods, that are applicable to interaction in general, educational settings in particular, are discussed and applied. Videotape from actual school settings form the basis of discussion. Student projects will be based on videotape of students' own classrooms, whenever possible.

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. (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. (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. (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 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.*

Theatre

OFFICE: 2550 Galbraith Hall, Revelle College

Professors

Andrei Belgrader, M.F.A.
Andrei Both, M.F.A.
Eric Christmas, *Emeritus*
Frantisek Deak, Ph.D., *Dean*
Deborah Dryden, M.F.A.
Floyd Gaffney, Ph.D., *Emeritus*
Jorge Huerta, Ph.D.
Walton Jones, M.F.A.
Marianne McDonald, Ph.D.
Chris Parry
Adele Shank, M.A.
Theodore Shank, Ph.D., *Emeritus*
Arthur Wagner, Ph.D., *Emeritus*
Les Waters, B.A.

Associate Professors

James Carmody, Ph.D., *Chair*
Mary Corrigan, M.A., *Emeritus*
Allan Havis, M.F.A.
Luther James, *Emeritus*
Jonathan Saville, Ph.D., *Emeritus*
James Winker, M.F.A.

Senior Lecturers with Security of Employment

Margaret Marshall, M.F.A.

Lecturers with Security of Employment

Steven Adler, M.F.A.
Ursula Meyer, M.F.A.
Patricia A. Rincon, M.F.A.

Assistant Professors

Tony Curiel, M.A.

Lecturers

Jean Isaacs, B.A.
Ron Ranson, M.F.A.
Alicia E. Rincon, M.F.A.
Judith A. Sharp, B.S.
Linda Vickerman, D.M.A.
Kristin Arcidiacono, B.F.A.
Sandra Foster-King, M.F.A.

The curriculum of the Department of Theatre is based on the belief that a good undergraduate education in theatre 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, and design. Finally, such an education should incorporate participation in the production process itself.

In addition to providing an integrated program for students desiring a theatre 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 program of concentration requirements; (3) courses to fulfill Revelle, Thurgood Marshall, and Eleanor Roosevelt's fine arts requirements; and (4) elective courses for the general student desiring experiences in theatre.

The Theatre Major

The theatre major provides students with a solid artistic and academic background. The required lower-division courses equip the student with the skills and knowledge necessary for more advanced study in each of the areas of study. The major is structured so that it can respond both to the needs of students who seek a broad-based "liberal arts" education in theatre or to the needs of students 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 adviser as soon as practical (but no later than the quarter in which they declare a theatre major) in order to plan an appropriate individual course of study.

At least 50 percent of all required course work in theatre must be taken at UCSD. Units of theatre practicum (THPR), or their equivalent, completed elsewhere *do not* satisfy the theatre department's requirements. All required courses must be taken for a letter grade. No theatre department course for which a student earns a grade lower than C– can be counted as satisfying any of the department's graduation requirements.

The requirements for the major are:

LOWER-DIVISION REQUIREMENTS

1. One course from:
   THPR 1 Practicum–Scenery
   THPR 2 Practicum–Costume
   THPR 3 Practicum–Lighting
   THPR 4 Practicum–Stage Management
   Note: Students must complete the THPR requirement within one year of declaring a theatre major.
2. Each of the following:
   THHS 1 Drama Survey: Tragedy
   THHS 2 Drama Survey: Comedy
   THHS 3 Drama Survey: Modern
   Note: THHS 1 or THHS 2 or THHS 3 must be completed before taking any upper-division classes in history and theory.
3. Each of the area threshold classes:
   Performance Area–
   a) THAC 1 (Introduction to Acting)
   or
   b) Any *two* of THDA 1 (Ballet I) or THDA 2 (Modern Dance I) or THDA 3 (Jazz Dance I)
   Note: A total of 4.0 units equals a completed course for THDA 1, 2, or 3.

   Design Area–
   a) THDE 1 (Introduction to Design)

   Playwriting Area–
   a) THPW 1 (Introduction to Playwriting)
   Note: The threshold classes listed above must be completed before taking any upper-division courses in each area.

UPPER-DIVISION REQUIREMENTS

4. Any four, 4-unit upper-division courses in history and theory (THHS)
5. Any four, 4-unit upper-division courses in one of the following areas: acting (THAC), design (THDE), choreography, directing, and stage management (THDR), or playwriting (THPW).
6. Any four, 4-unit upper-division theatre electives.
   Note: THGE 197, 198, and 199 may not be used as upper-division electives by theatre majors.

The Theatre Minor

Students should plan their minors and have them approved by the faculty undergraduate adviser prior to their junior year. Courses may not be taken on a Pass/Not Pass basis. The Department of Theatre offers two different ways of structuring a theatre minor. Students may take the theatre minor as listed below or as a second option, take the first two lower-division requirements and *four* upper-division electives.

The requirements for the theatre minor are:

LOWER-DIVISION REQUIREMENTS

1. One course from:
   THPR 1 Practicum–Scenery
   THPR 2 Practicum–Costume
   THPR 3 Practicum–Lighting
   THPR 4 Practicum–Stage Management
   Note: Students must complete the THPR requirement within one year of declaring a theatre minor.
2. At least one course from:
   THHS 1 Drama Survey: Tragedy
   THHS 2 Drama Survey: Comedy
   THHS 3 Drama Survey: Modern
   Note: THHS 1 *or* THHS 2 *or* THHS 3 must be completed before taking any upper-division classes in history and theory.
   THAC 1 Introduction to Acting
   Note: THAC 1 must be completed before taking any upper-division classes in acting.
   THDE 1 Introduction to Design
   Note: THDE 1 must be completed before taking any upper-division classes in design.
   THPW 1 Introduction to Playwriting
   Note: THPW 1 must be completed before taking any upper-division classes in playwriting.
3. One lower-division theatre elective.

UPPER-DIVISION REQUIREMENTS

4. Any three, 4.0 unit, upper-division theatre courses.
   Note: THGE 197, 198, and 199 may **not** be used as upper-division electives by theatre minors.

Performance and Production Opportunities in Theatre

PRODUCTIONS

Undergraduates may audition for all shows produced in the department. Undergraduates are frequently cast in these productions and have often played substantial roles. In addition, the department produces a faculty-directed undergraduate production on the mainstage. The cast, designers, and crew are undergraduates.

CABARET

Additional opportunities exist for graduate and undergraduate students to produce and/or perform in plays and other events in the department's Studio Theatre.

STUDIO PROJECT

There will be one undergraduate Studio Project slot each quarter. This is an opportunity for undergraduates to gain production experience by participating in the creation of a student-directed studio production of an existing playscript or playscript in development (new play).

SPRING CELEBRATION OF THE ARTS

Each spring quarter there is a Celebration of the Arts. The celebration is a diverse and expansive showcase of work done by UCSD undergraduates in all fields of art.

Undergraduate Audition Policy

Each quarter, open auditions will be held for all shows being produced in the subsequent quarter. All undergraduates who have completed THAC 1 (Introduction to Acting) are eligible to audition. (This prerequisite is subject to revision.) Complete information about the schedule as well as the format of auditions may be obtained in the department office.

The Dance Minor

University-trained dancers should have a solid academic base on which to build their dance technique education. Theories and principles of dance as a creative art enrich and develop the trained dancer. Through instruction in choreography, dance moves from a display of technical skills to a creative endeavor. The dance minor will enhance creative expression by providing choreographic and performance opportunities generated by academic instruction.

The dance minor consists of three core courses: two upper and one lower division. These courses 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.

PLACEMENT AND PROFICIENCY

The technical command of the body and expansion of vocabulary of movement are essential to the dancer's creative expression. Upon completion of a studio technique course, students who demonstrate the performance level necessary for the next level of work will advance. Students who do not demonstrate the appropriate performance level will be expected to continue at the same level until they qualify for advancement. Only twelve units of movement courses may be applied toward the dance minor.

MOVEMENT REQUIREMENTS

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 1) courses (up to two years) or until they pass the audition into level II.

Students wishing to enter the minor in dance must audition during classes in spring for placement in the appropriate movement class for fall. Freshman and transfer students may audition the first week of classes in fall quarter.

Of the total credits earned, **only twelve units from those listed in the movement courses** (see below) **may be applied** toward the dance minor. Students must include at least one movement course other than their main idiom.

Lower-Division Requirements:

One of THPR 1, 2, 3, or 4

Upper-Division Requirements:

One of THDR 140, 141, 142, or 143
One of THHS 151 or 152 or 153 or 159
(Dance History—Ballet, Modern, Jazz/Ethnic, Criticism and Aesthetics)

MOVEMENT REQUIREMENTS:

Twelve units required in lower- and/or upper-division movement courses. The students' levels are determined by auditions held in class prior to the preregistration deadline. Freshmen and transfer students must audition the first two weeks of fall quarter in the appropriate class.

Choose a total of twelve 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 15, 16, or 17 Musical Theatre (two units each)
THDA 101A, B, or C Ballet II (Intermediate, two units each)
THDA 102A, B, or C Ballet III (Advanced 1, four units each)
THDA 103A, B, or C Ballet IV (Advanced 2, four units each)
THDA 110A, B, or C Modern II (Intermediate, two units each)
THDA 111A, B, or C Modern III (Advanced 1, four units each)
THDA 112A, B, or C Modern IV (Advanced 2, four units each)
THDA 120A, B, or C Jazz II (Intermediate, two units each)
THDA 121A, B, or C Jazz III (Advanced 1, four units each)
THDA 122A, B, or C Jazz IV (Advanced 2, four units each)
Total Lower-Division Core Units 4
Total Upper-Division Core Units 8
Total Movement Units 12
(may be upper- or lower-division units)

Total Units for Dance Minor Students 24

Performance Opportunities

ANNUAL CONCERTS

The work of selected students is presented at a formal concert each spring. A concert of faculty and guest artists' choreography is presented each winter.

SPRING CELEBRATION OF THE ARTS

This celebration is held in spring quarter to showcase students' experimental choreography.

UCSD DANCE REPERTORY

This repertory is open to dance students through auditions. The company will perform lecture-demonstrations, performances, and master classes in the community or at other UC campuses.

Professional Company 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 Jazz Unlimited, California Ballet Co., City Moves, Isaacs, McCaleb & Dancers, and other San Diego area professional dance companies.

Honors Program

The department offers a special program of advanced study for outstanding undergraduates majoring in theatre. 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 students *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

Guidelines

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 twelve upper-division required courses for the major. THGE 196A and B are to be taken consecutively and may not be taken concurrently.

The Graduate Program: M.F.A. in Theatre

The Department of Theatre 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 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, dramaturgy/criticism, playwriting, and stage management will complete at least ninety quarter-units of academic work during their tenure in the program.

COURSES

NOTE: For changes in major requirements and in course offerings implemented after publication, inquire at the office of the Department of Theatre.

The subject codes are:

THAC Acting
THDA Dance
THDE Design
THDR Directing, Choreography, Stage Management
THGE General
THHS History and Theory
THPR Practicum
THPW Playwriting

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 10. Theatre Games (4)
Theatre Games is an introductory course to performance. Using theatre games and exercises and a gradual introduction to text, students will learn a very personal approach to the act of performance. This is a process studio class; it is performance oriented. The grade is based on participation, attendance, and the in-class development of a final project. No experience or prerequisites needed. Offered in Summer Session only.

TH/AC 11. Stage Combat (4)
This course teaches the basic falls, punches, kicks, slaps, hair-pulls, and barroom brawling techniques used in theatre, film, and television. Students will learn to perform staged violence safely, effectively, and convincingly. Summer Session only.

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 103. Acting III (4)
A course in which the student actor forms a professional working approach to the acting process. Advanced scene study of scenes from contemporary American plays focuses on the revelation of text through action using repeated stagings of a scene. *Prerequisite: THAC 102 and audition.*

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. Admission by audition only. *Prerequisite: THAC 103.*

TH/AC 105. Rehearsing Shakespeare (4)
In this course the student actor will explore the acting process with scenes from Shakespeare through verse exercises and textual analysis. Admission by audition. *Prerequisite: THAC 103.*

TH/AC 106. Acting for the Camera (4)
This course is designed to sharpen the performer's basic dramatic abilities and aid 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 the television. Explorations in staging on the movie set involving differing camera angles. Students will rehearse and perform in simulated studio setting. *Prerequisites: THAC 101, 102, and 103.*

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, and should have taken 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. Audition required. *Prerequisite: THAC 103.*

TH/AC 110. Speech for the Actor (4)
Course is designed to establish a clear understanding of the fundamentals of good speech for the theatre. The methodologies explore the practical integration of clear articulation, pronunciation, and oral interpretation as they apply to various contemporary and classical dramatic texts. Students must attend all Department of Theatre productions during the quarter. *Prerequisite: none.*

TH/AC 111. Freeing the Voice (4)
Intensive workshop for actors and directors designed to "free the voice," with special emphasis on characterization 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: none.*

TH/AC 115. Movement for Actors (4)
An integration of the actor's physical and emotional tools into a unified whole. Incorporating yoga exercises and oriental/occidental movement forms including Tai Chi and Suzuki, the student is challenged to explore and utilize new areas of dramatic expression. *Prerequisite: none.*

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. (Cross-listed with Ethnic Studies 146A.)

TH/AC 122. Ensemble: Undergraduate Production (4)
An intensive theatre practicum involving creating a theatre production. Includes text analysis and explorations of the directing and acting processes, as well as technical support, and performance. Department stamp required. Audition may be required.

TH/AC 123. Advanced Studies in Performance (4)
Participation in a fully staged season production for the Department of Theatre. Admission by audition only. A maximum of eight units may be used for major credit.

TH/DA Dance

TH/DA 1. Ballet, Level I Beginning (2-2)
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.*

TH/DA 2. Modern Dance I, Beginning (2-2)
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.*

TH/DA 3. Jazz Dance I, Beginning (2-2)
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.*

TH/DA 15. Musical Theatre Dance: 1900–1930 (2)
The study of American social and theatrical dances from the 1900s to the 1930s. Historical trends in musical theatre will be discussed with the use of film and text. Stresses choreography and musical analysis and introduces basic tap dance rhythms. *Prerequisite: none.*

TH/DA 16. Musical Theatre Dance: 1930–1960 (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 17. Musical Theatre Dance: 1960–Present (2)
Integrates the historical and contemporary trends of musical theatre dance from the 1960s to present. Emphasis on the impact and development of dance techniques used in video, film, and theatre and on advance clarification of performance and choreographic skills. *Prerequisite: none.*

TH/DA 11A. Theatrical Tap (2)
Emphasis on rhythm, coordination, timing, and theatrical style. Includes intricate rhythms such as riffs, pull backs, and wings. *Prerequisite: THDA 15.*

TH/DA 11B. Theatrical Tap (2)
Introduces more complicated rhythms and advanced principles of dance composition for the theatre. *Prerequisite: THDA 11A.*

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. Department stamp required.

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. *Prerequisites: THDA 1 is prerequisite for THDA 101A. THDA 101A is prerequisite for THDA 101B and THDA 101B is prerequisite for THDA 101C.*

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. *Prerequisites: THDA 101C is a prerequisite for THDA 102A. THDA 102A is prerequisite for THDA 102B and THDA 102B is prerequisite for THDA 102C.*

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. *Prerequisites: THDA 102C is a prerequisite for THDA 103A. THDA 103A is prerequisite for THDA 103B and THDA 103B is prerequisite for THDA 103C.*

TH/DA 110A-B-C. Modern Dance II–Intermediate (2-2-2)
Further development of movement as an expressive medium. Introduces the prinicples and elements of modern dance and their relationship to other art forms. Discussion of modern dance pioneers. *Prerequisites: THDA 2 is a prerequisite for THDA 110A. THDA 110A is a prerequisite for THDA 110B and THDA 110B is prerequisite for THDA 110C.*

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 prinicples of human movement. Discussion of modern and postmodern trends using text, video, and film. *Prerequisites: THDA 110C is a prerequisite for THDA 111A. THDA 111A is a prerequisite for THDA 111B and THDA 111B is prerequisite for THDA 111C.*

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. *Prerequisites: THDA 111C is a prerequisite for THDA 112A. THDA 112A is a prerequisite for THDA 112B and THDA 112B is prerequisite for THDA 112C.*

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. *Prerequisites: THDA 3 is a prerequisite for THDA 120A. THDA 120A is a prerequisite for THDA 120B and THDA 120B is prerequisite for THDA 120C.*

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. *Prerequisites: THDA 120C is a prerequisite for THDA 121A. THDA 121A is a prerequisite for THDA 121B and THDA 121B is prerequisite for THDA 121C.*

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. *Prerequisites: THDA 121C is a prerequisite for THDA 122A. THDA 122A is a prerequisite for THDA 122B and THDA 122B is prerequisite for THDA 122C.*

TH/DA 130. Studies in Performance–Dance (2–4)
The in-depth study of a major dance production, culminating in a production. Admission by audition only. A combined total of eight units of THDA 130 and THDA 131 may count toward major requirements.

TH/DA 131. Dance Repertory (2)
The study and aesthetic examination of major choreographic works created by dance faculty of the Department of Theatre or distinguished guest artists. Audition is required. A combined total of eight units of THDA 130 and THDA 131 may count toward major requirements.

TH/DA 132. Dances of the World (4)
Course designed for in-depth sutdy of the dance of a particular culture–Afro-Cuban, Spanish, Balinese, Japanese, etc. Specific topic will vary from quarter to quarter. *Prerequisite: upper-division standing.*

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 197. Field Studies in Dance (2–8)
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.*

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 Production: Scenery (4)
One of three survey classes in theatre production. This course introduces students to stage equipment, the elements of scenic design, drafting, painting, model making, and critical analysis of scenic design for the theatre. *Prerequisite: THDE 1 or consent of instructor.*

TH/DE 102. Scene Design (4)
Projects in scene design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes scale model building, or rendering in various media for specific plays. *Prerequisite: THDE 101 or consent of instructor.*

TH/DE 111. Theatre Production: Costumes (4)
This course surveys the process of costume designer from script analysis, research, drawing, and rendering the costume sketch through the process of costume construction and related skills: millinery, fabric painting/dyeing, armor. Lecture and demonstration labs will parallel lecture material. This course is for those interested in a basic understanding of the costumer's process. No previous drawing or painting skills required. *Prerequisite: THDE 1.*

TH/DE 112. 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. THDE 113, 114, 133 recommended. *Prerequisite: THDE 111.*

TH/DE 113. Evolution in Fashion (4)
A survey history tracing the evolution of clothing as an art form within its social and cultural context. THDE 113 covers material from Greek and Roman civilizations through the eighteenth century in Europe. THDE 113 and 114 are offered alternate years. Upper division standing required. *Prerequisite. THDE 1.*

TH/DE 114. Evolution in Fashion (4)
A survey history tracing the evolution of clothing as an art form within its social and cultural context. THDE 114 develops these principles in the context of the nineteenth century and twentieth century. THDE 113 and 114 are offered alternate years. Upper-division standing required. *Prerequisite: THDE 1.*

TH/DE 121. Theatre Production: Lighting (4)
One of three survey classes in theatre production. This course introduces students to stage lighting equipment, the elements of lighting design, drafting, and critical analysis of lighting for the theatre. *Prerequisite: THDE 1 or consent of instructor.*

TH/DE 124. Lighting Design (4)
This course aims to develop the student's visual imagination in the context of lighting design and composition through a series of studio/lab projects. These emphasize research, conceptualization, visual expression, and collaboration. Studio work involves manipulating light and color, and drafting basic lighting plots. *Prerequisite: THDE 121 or consent of instructor. THPR 3 is also recommended prior to taking this class.*

TH/DE 125. Light, Color, Art, and Environment (4)
An investigation of light, lighting techniques, and their impact on contemporary life. The course examines light and lighting techniques used in art, industry, architecture, theatre, movies, etc. to illustrate how to use the power of light, and how we are in turn affected by it in subtle and overt ways. Students will perform research and submit papers. *Prerequisite: none.*

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.*

TH/DE 132. Drafting for the Theatre (4)
Studies in technical drawing for the theatre designer and technician. Through instruction and laboratory exercises, the student attains a basic understanding of technical drawing and graphic skills to effectively communicate design ideas to scenic and lighting workshops. *Prerequisite: THDE 101 or 121 or consent of instructor.*

TH/DE 133. Ideas and Styles in Scenic Design (4)
An exploration of fundamental ways of seeing and thinking about the theatrical space. A special emphasis on design and the solution-finding process in design, as it reflects ideas, styles, attitudes, ways of seeing, etc. An integrated study through lecture, reading, discussion, and projects. *Prerequisite: none.*

TH/DE 134. Scenic Painting (4)
A specific overview and hands-on class exploring many common and unique painting techniques for large scale theatre scenery. Weekly topics focus on tools, safety procedures, and application of methods to student projects. *Prerequisite: THDE 1 or consent of instructor.*

TH/DE 135. Model Making (4)
A hands-on class to expose the theatre student to a wide variety of tools and scale model making techniques utilized in theatre design. Weekly projects build skills and design ideas for individual models. *Prerequisite: THDE 1 or consent of instructor.*

TH/DE 136. Computer Graphics for the Theatre (4)
A hands-on class to develop computer-generated graphics techniques that apply to different areas in the theatre. Program, posters, newspaper ads, title blocks, lighting, and other graphics modeling applications are explored each week on individual projects. *Prerequisites: THDE 1 and THDE132, or consent of instructor.*

TH/DE 137. Life Drawing (4)
This class, using live models, is geared to help build drawing skills through an understanding of the human form. Emphasis is placed on observation techniques that benefit all levels from the novice to the accomplished artist. A maximum of four units may be used to fulfill major requirements.

TH/DE 138. Principles of Collaboration; A Design Team Approach (4)
This class advances the theories and practices of TH/DE 1 with projects that emphasize the collaborative nature of theatre. Hands-on studio projects in costume, lighting, and sets stress a team approach to a unified concept of design. *Prerequisite: THDE 1.*

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, Stage Management or Playwriting) may be used to fulfill major requirements. *Prerequisite: admission by consent of instructor only. See department for Special Projects Application.*

TH/DR Directing/Choreography/ Stage Management

TH/DR 15. From Here to Broadway: The Development of a Broadway Play (4)
An exploration of the world of professional theatre production in America, focusing on the artistic and economic factors involved in bringing a play from the regional theatre to Broadway.

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 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. Taught every fall. This course may be used to fulfill the upper division Acting emphasis requirement. *Prerequisite: upper-division standing or consent of instructor.*

TH/DR 110. History and Theory of Directing (4)
Evolution of directing theory from 1850 to present with reference to the work of internationally influential directors such as Saxe-Meiningen, Antoine, Stanislavski, Meyerhold, Brecht, and Brook, among others. This course may be used to fulfill an upper-division theatre history requirement. *Prerequisite: upper-division standing or consent of instructor.*

TH/DR 111. Directing I (4)
A studio class that investigates the fundamental skills of the director. Through exercises and scene work, students learn how to animate the text on stage, as they develop skill in text analysis, staging, and dramatic storytelling. *Prerequisite: THDR 108.*

TH/DR 112. Directing II (4)
Select students will continue the investigation of the directing process by working with more complex material. Topics will include developing a directorial style, advanced rehearsal techniques, and working with non-realistic texts. Students will direct a series of scripted scenes. Taught every other spring. *Prerequisites: THDR 111 and consent of instructor.*

TH/DR 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/DR 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. Department stamp required.

TH/DR 142. Choreography and Performance (4)
Theories and techniques of advanced choreographic problems exploring a range of performance options including multimedia collaborations using video, text, lighting, props, masks, dance/music improvisations, and environmental choreography and performance. Department stamp required.

TH/DR 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 nonverbal communication. *Prerequisites: THDA 1, or THDA 2, or THDA 3, or above, and THAC 1, or consent of instructor.*

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, Stage Management or Playwriting) may be used to fulfill major requirements. See department for application. *Prerequisites: THDR 108, 111, and consent of instructor.*

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.*

TH/GE Theatre General

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 Charlie Chaplin and Orson Welles to that of present day stars. Analysis of the script, the details of the production, the craft of the actor, and how these come together to produce the art of cinematic performance. *Prerequisite: none.*

TH/GE 12. Great Films of Great Plays (4)
Examination of selected contemporary films based upon important plays. Involves viewing films, reading plays upon which they were based, and discussion of the transition of themes and artistic choices made in translation from one media to another. *Prerequisite: none.*

TH/GE 13. Shakespeare on Stage and Screen (4)
A close look at the performance of Shakespeare's plays in the theatre from the point of view of actor and director, illustrated with scenes presented live and on film. *Prerequisite: none.*

TH/GE 15. Introduction to World Theatre (4)
An exploration of dramatic forms and traditions from a range of cultures. Topics may include ritual and theatre; theatre and society; script and improvisation; acting and the actor; gesture; costuming and scenic space. *Prerequisite: none.*

TH/GE 25. Introduction to Speech (4)
This course is designed to extablish 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 90. Undergraduate Seminar (1)
Discussion of various theatre topics.

TH/GE 101. Apprenticeship/La Jolla Playhouse (4)
Professional production experience with performance training. In addition to conservatory class work, apprentices are with a production for the entire rehearsal and performance process. Assignments from two to eleven weeks, May\-August depending on availability. This course does not satisfy any theatre major or minor requirements. *Prerequisites: audition/interview, upper-division standing, resume, and three letters of recommendation.*

TH/GE 102. Conservatory/La Jolla Playhouse (12)
Concentrated studies in acting, scene study, text analysis, voice, speech, and movement. Taught by theatre professionals from the La Jolla Playhouse and UCSD Department of Theatre. Eight-week program, Tuesday\-Friday, 9:00 a.m\-5:00 p.m., concluding with a workshop presentation. This course does not satisfy any theatre major or minor requirements. *Prerequisites: audition/interview, upper-division standing, or consent of instructor.*

TH/GE 105. Studio Project (4)
Opportunity for students to gain production experience by participating in the creation of a student-directed studio projection of an existing playscript or playscript in development. Audition may be required. *Prerequisites: THPR 1, 2, 3, or 4, and consent of instructor.*

TH/GE 107. From Here to Broadway: Contemporary American Theatre Production (4)
The evolution of contemporary American theatre production, focusing on the influence of historic, artistic, and economic factors involved in the not-for-profit and commercial theatre arenas, such as Off-Broadway, the Resident Theatre movement, and Broadway. *Prerequisite: upper-division standing, or consent of instructor.*

TH/GE 120. Contemporary Film: Dramatizing Our World (4)
An examination of eight to ten selected films (mostly American) from the '80s and '90s as explorations of aspects of contemporary life. The class will concentrate on the ways in which selected filmmakers use film as a dramatic medium to address some of the complex issues facing contemporary society. Particular attention will be paid to comedies, thrillers, and romances. Students will be required to see some films in current release. *Prerequisites: none.*

TH/GE 121. Broadway Goes Hollywood: Great American Movie Musicals (12)
This class examines that quintessentially American art form, the musical film. We will trace its origins from the Broadway stage via Hollywood in the 1920s through the great years during the studio heydays of the '30s through the '60s, as well as examine the musical film's current status. Examples are *The Jazz Singer, Jesus Christ Superstar,* and others. *Prerequisite: upper-division standing or consent of instructor.*

TH/GE 122. Chicanos on the Screen (12)
The course will examine the evolution of Chicanos' presence on the screen—both large and small—from the early documentaries of the mid-sixties to contemporary feature films written and/or directed by Chicanos. *Prerequisite: upper-division standing or consent of instructor.*

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 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."

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 (2-8)
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 or 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.

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.

TH/HS Theatre History

TH/HS 1. Drama Survey: Tragedy (4)
A close examination of plays that reveal man as overreacher, mans as a dreamer, man as a self-destroyer, and man as both victim and victor in the conflict with his cosmos. *Prerequisite: none.*

TH/HS 2. Drama Survey: Comedy (4)
Study of comic tradition from Aristophanes to the end of the nineteenth century. *Prerequisite: none.*

TH/HS 3. Drama Survey: Modern (4)
A close examination of a selection of modern plays that draw from the tragic and comic traditions to generate theatre that reflects the modern consciousness. Particular consideration will be given to the multiple formalistic experiments of the twentieth century, ranging from the expressionalism to the epic theatre. *Prerequisite: none.*

TH/HS 4. Introduction to Contemporary Chicano Theatre (4)
A survey of the development of contemporary Chicano theatre from the indigenous roots in Aztec and Maya dance/drama to the emergence of the Teatro Campesino and other "Teatros" in the mid-1960s. The course will focus on Chicano theatre as ritual and document especially in the early "Actos" of Luis Valdez and other Chicano theatre groups and playwrights.

TH/HS 5. Introduction to Black Drama (4)
Course designed to provide students with a meaningful and accurate definition of the black artist within the American theatre, past, present, and future. Some quarters will deal with a single black artist, playwright, director, or actor.

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 1 or 2 or 3 or consent of instructor.*

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 Molière, Fugard, and Strindberg. *Prerequisite: THHS 1 or THHS 2 or THHS 3 or consent of instructor.*

TH/HS 103. Ancient Greek Drama in Modern Version (4)
Ancient Greek plays still ask questions that need to be asked. Studies ancient myths as they reappear in contemporary files, on stage, and in opera. Includes analysis of media techniques in examining ancient Greek drama in its living form. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 105. Topics in Classical Comedy (4)
An advanced study of selected aspects of romantic comedy, the comedy of manners, and farce from the seventeenth to the early twentieth centuries. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 109. African Heritage in Contemporary Drama: African, Caribbean, and African-American (4)
This course is designed to introduce students to African, Caribbean, and African-American theatre/playwrights. Students will discover classwork to be intensive rather than exhaustive. Each play will be examined for sources of dramatic power, type of world presented, relationships to audience, uses of language, uses of art as politics. *Prerequisite: THHS 5 or consent of instructor.*

TH/HS 110. Chicano Dramatic Literature (4)
Focusing on the contemporary evolution of Chicano dramatic literature, 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 1 or 2 or 3 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 1 or 2 or 3 or consent of instructor.*

TH/HS 112. Experimental Theatre (4)
Course dealing with the forms of contemporary theatre and principal figures in the contemporary theatre world–play-

wrights, directors, designers, and performers. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 113. Contemporary American and British Drama (4)
Survey of the American and British works from the 1950s to the present. Playwrights to be read include writers such as Pinter, Hare, Churchill, Brenton, Osborne, Albee, Guare, Shepard, Durang, Mamet, and Fornes. Course may include assigned visit to local theatre production. *Prerequisite: THHS 1 or 2 or 3 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. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 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/HS 152. Dance History–Modern Dance (4)
A study of modern dance as a reflection of history from its origins and aesthetic development 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/HS 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/HS 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/PR Practicum

TH/PR 1. Practicum–Scenery (4)
A production performance oriented course that introduces fundamentals of scenery constructed 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)
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)
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 4. Practicum–Stage Management (4)
A production performance oriented course that introduces fundamentals of stage management. Laboratory format allows students to work through entire production process culminating in a fully mounted theatrical production. *Prerequisite: department stamp required.*

TH/PR 104. Advanced Practicum in Stage Management (4)
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: THPR 4, THDR 101, and consent of instructor.*

TH/PW Playwriting

TH/PW 1. Introduction to Playwriting (4)
A workshop designed to liberate the dramatic imagination. Students develop character and action through a variety of individual and group exercises that involve activities such as real-world observation, acting improvisations, or written work.

TH/PW 101. Playwriting Workshop I (4)
Second in the playwriting series, THPW 101 focuses on dramatic structure. Students write a one-act play via a series of exercises that develop dramatic action, character, dialogue. Workshop classes include lectures and group discussions of students' writing. *Prerequisite: THPW 1.*

TH/PW 102. Playwriting Workshop II (4)
Continuation of the playwriting process, focusing primarily on character development and writing dialogue. Students will write a one-act play which may be for a specific non-theatre space. Group discussion of work. *Prerequisite: THPW 101.*

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 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, 102, and/or consent of instructor. See department for application form.

GRADUATE

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.

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.

202. Collaborative Process (3)
The process of collaborative creation from idea to performance. *Prerequisite: graduate standing.*

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. *Prerequisite: graduate standing.*

204B. Performance Analysis (4)
Semiotic analysis of historically significant and/or contemporary theatrical performances: research methodologies; problems of documentation; scenic writing and the dramatic text; the cultural context of mise-en-scéne. *Prerequisite: graduate standing.*

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. *Prerequisite: graduate standing.*

206. Faculty Directed Production (1-8)
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. *Prerequisite: graduate standing.*

207. Production (1-12)
The collaborative process from the rehearsal process through public performance. All participants will enroll in the same section, the number of units depending upon degree of involvement. When appropriate, weekly meetings for supplementary exploration will be added, and students will receive one additional unit.

208. Contemporary Performance (2)
An introduction to performances, ideas, and individuals in contemporary theatre. Work outside of class involves reading, viewing of videotapes, and the preparation of performance compositions. Intended for all first-year graduate students in theatre.

209. Comic Techniques (2)
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. *Prerequisite: graduate standing.*

210A. Acting Process I (3)
Actors focus on the nature of the acting process using exercises to stimulate imagination. Later work includes action and characterization using imaging and improvisational techniques to explore text and character. Directors work as actors and as directors of information-getting exercises and myth exploration.

210B. Acting Process I (3)
The first four weeks are devoted to intensive rehearsal with faculty or guest director ending in public performance. Classes are suspended during rehearsals and instructors work with the production. The remainder of the quarter focuses on facial masks, physical characterization, and improvisation ending in a cabaret improv. competition.

210C. Acting Process I (3)
Text analysis of a realistic play ending in a public performance of scenes from that play.

211A-B-C. Speech for the Actor I (1-1-1)
Introduction of the principles of phonetics and articulation. Constant study and drill to prepare the actor for standard speech and flexibility. *Prerequisite: graduate standing.*

213-A-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.*

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.*

215. Stage Makeup (1)
Course moves from fundamentals of makeup for the theatre (historical styles, development of makeup media) to special effects derived from various materials, facial structure and basic makeup design, color and light in makeup, basic application theory and technique. *Prerequisite: graduate standing.*

216. Singing for the Actor I (1)
Vocal technique for the musical theatre. Exercises, scales, sight reading, ensemble work, preparation of individual pieces. *Prerequisite: graduate standing.*

217. New Plays Workshop (1-4)
A weekly workshop with actors, directors, writers, and dramaturgs. Course will focus on the development of stage readings of new works by the playwriting students. *Prerequisite: graduate standing.*

218. Introduction to Directing (1-4)
An introduction to the fundamental tools and resources of the director by the examination of scene work from four plays. This course is designed for students not in the directing program. *Prerequisite: graduate standing.*

219. Directing Process Studio (2/4)
Preparation, presentation, and discussion of representative scenes from various periods of dramatic literature. *Prerequisite: graduate standing.*

220A-B. Acting Process II: Classical Text (3-3)
An intensive studio examination of problems and potentials associated with the theatrical realization of the classical text.

221A-B. Speech for the Actor II (2-2)
Advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles. *Prerequisite: graduate standing.*

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.*

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.*

225A-B. Singing for the Actor II (1)
Continuing vocal technique for the musical theatre. More complicated musical material investigated and prepared. *Prerequisite: graduate standing.*

226. Hispanic-American Theatre History (4)
A study of the major Hispanic-American theatrical movements, from the early Spanish colonial religious drama of the southwest to the current Hispanic-American theatre movement. Course work will focus on prominent figures as well as representative plays of the periods studied. *Prerequisites: Theatre 42, 43, 44, and consent of instructor.*

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.

230. Acting Process III: Actors' Studio (3)
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.

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.

234. Voice for Theatre III (1-2)
A one-quarter course devoted exclusively to intensive development of the actor's vocal capability to master a variety of musical theatre scores. Concentration on extending the vocal range, sight reading, textual and musical analysis, and musical characterization.

235. Singing for the Actor III (1)
Continuing vocal technique for the musical theatre. More complicated musical material investigated and prepared. *Prerequisite: graduate standing.*

238. Speech for the Actor III (1)
Continuing advanced work in phonetics and articulation. Intensive study of stage dialects to prepare actor for variety of roles. *Prerequisite: graduate standing.*

239. Movement for Theatre III (1)
An advanced course in the art of movement for the theatre, building on the knowledge gained in Theatre 223A and B. *Prerequisite: graduate standing.*

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. *Prerequisite: graduate standing.*

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. *Prerequisite: graduate standing.*

244. Dramatic Structure (2-4)
Analysis of fundamentals of dramatic structure; plotting, thematic structure, structure of action at the level of scene. Study of well-structured plays in several styles. Practical exercises in constructing plays effectively, along with theoretical considerations. *Prerequisite: graduate standing.*

245. Directing Practicum (2-4)
Students enrolled in this course will work on productions in the function of a director. This will include staging, creative interpretation, blocking, etc. *Prerequisite: graduate standing.*

249. TheatreForum Workshop (2)
A workshop focusing on the editing of *TheatreForum*, involving evaluation of submitted articles and the comparative study of competing theatre and performance journals. Students participate actively in all aspects of the editing and production of *Theatre Forum. Prerequisite: graduate standing.*

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.*

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.*

252. Dramaturgy Seminar (2-3)
The seminar will deal with all dramaturgical issues pertaining to departmental productions: production research, textual 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.*

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.*

255. Restaging the Classics (4)
A series of detailed dramaturgic and scenographic examinations of influential reinterpretations of classic dramatic texts. The seminar will investigate selected texts from the dual perspectives of historic and contemporary theatre practice. *Prerequisite: graduate standing.*

256. Contemporary Plays (2)
A guided reading course focusing exclusively on very recent plays in an attempt to become aware of what is being written now. Plays chosen will be primarily American. Course may be repeated for credit.

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.*

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.*

260. Theatrical Modernism: Nineteenth to Twentieth Century (4)
Topics to be covered include: radicalism of realism; symbolist theatre and the origins of the avant-garde; the new director as an artist; new structures of representation; painters and the modern theatre; from modernism to postmodernism. *Prerequisite: graduate standing.*

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.*

262. Seminar in Drama, 1650–1900
Investigation of major dramatic texts from Neoclassicism to Realism. *Prerequisite: graduate standing.*

263. Seminar in Drama, 1900–present
Investigation of major dramatic texts from the modern and contemporary theatre. *Prerequisite: graduate standing.*

265. Black Dramatists in the Diaspora (4)
The course will examine a number of works from Black Africa and others of Black African descent in various parts of the world. The most vital, energetic and significant contributors on the international scene, Soyinka, Walcott, Wilson, Baraka, and Nascimento, are among those represented.

268. Latin American Dramatic Literature (4)
This seminar will focus on representative contemporary Latin American plays in Spanish as well as in English translation. Students will analyze the plays and dramatists from the perspective of a dynamic social, cultural, and political process. *Prerequisite: graduate standing.*

269. U.S.-Latino Dramatic Literature (4)
Depending upon quarter offered, seminar will focus on representative plays from one of the U.S. Latino communities (i.e., Chicano, Colombian, Cuban, or Puerto Rican playwrights in the U.S.) Students will analyze plays and dramatists from the perspective of a dynamic social, cultural, and political process. *Prerequisite: graduate standing.*

270A-B-C. Design Studio I: (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.*

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.*

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.*

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 graduate standing.*

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.*

277. Fabric Painting and Dyeing for the Theatre (4)
Studies in the surface treatment of fabric for theatre costume, includes textile design techniques of batik, silkscreen, blockprint, aging and distressing of costumes in addition to discussion of dye theory and pigment application. Class will include lecture, demonstration, and individual studio projects. *Prerequisite: graduate standing.*

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.*

279. Design Production (2)
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. *Prerequisite: graduate standing.*

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. *Prerequisite: graduate standing.*

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 and 280.*

282. Technical Production for Stage Managers (1-4)
A course aimed at developing knowledge and skill in the function and process of scenery, costume, and lighting workshops. Weekly projects will acquaint students with specific aspects of various workshops. *Prerequisite: graduate standing.*

284A. Nonprofit Theatre Structure (2-4)
A thorough examination of the structure of the not-for-profit theatre. Topics will include the artistic mandate, theatrical staff and hierarchy, budgets, implementing artistic vision, the board of trustees, and long- and short-term planning. *Prerequisite: first- or second-year graduate standing.*

284B. The Commercial Theatre Structure (2-4)
An analysis of commercial theatre. Topics include historical perspectives, relationship with not-for-profit theatre, general and limited partnerships, artistic vision, fundraising, and prospecti. *Prerequisite: second- and third-year graduate standing.*

285A. Advanced Stage Management: Problems (2-4)
A seminar that focuses on the various problems encountered in stage managing. Topics include relationships with collaborative artists and staff, rehearsal period, paperwork, psychology of performers, and professional guidelines. *Prerequisite: first- or second-year graduate standing.*

285B. Advanced Stage Management: Venues (4)
A seminar that approaches each venue in which the stage manager works as a discreet entity. Topics include rotating repertory, television, stock, and touring. *Prerequisite: first- or second-year graduate standing.*

285C. Advanced Stage Management: Musicals/ Dance (4)
A seminar that focuses on methodologies and strategies used in stage managing musicals, opera, and dance, tracing the involvement from preproduction to closing.

286. Special Topics in Stage Management (1-4)
A course for second-year M.F.A. students in stage management. Topics will vary from quarter to quarter, focusing on various aspects of theatre administration and stage management. *Prerequisite: graduate standing.*

287. Production Management (1-4)
Course follows the operation of a theatre production manager, including long-range scheduling, technical design management skills, hiring and contracts procedures, budget allocations, accounting considerations, and critical analysis.

288. Stage Management Seminar (1-12)
A weekly seminar in which all graduate stage managers participate. Includes discussions of problems encountered on current productions, paperwork, methodology, and production approaches. *Prerequisite: graduate standing.*

289. Theatre Development (4)
An in-depth analysis of strategies and techniques utilized in developing financial resources in the not-for-profit theatre. Class includes focus on topics such as grant writing, fundraising, capital drives, government and corporate funding, and development strategies. Prerequisite: second-year graduate standing.

290. Business Problems (4)
Each term the course will focus on a number of business problems in the theatre. Topics include contracts, unions, negotiations, insurance, accounting techniques, and box office management.

291. Theatre Marketing (4)
An in-depth approach to marketing techniques and strategies. Topics include advertising, box office, front of house, telemarketing, and budgeting. *Prerequisite: first- or second-year graduate standing.*

296. Stage Management Practicum (4-12)
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.*

297. Thesis Research (2-12)
Thesis research for M.F.A. degree. (S/U grades only.) *Prerequisite: graduate standing.*

298. Special Projects (0-4)
Advanced seminar and research projects in theatre. (S/U grades only.)

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.)

500. Apprentice Teaching (2)
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 papers and examinations under the supervision of the instructor assigned to the course. Participation in the undergraduate teaching program is required for the M.F.A. degree. The amount of teaching required is equivalent to the duties expected of a 25 percent teaching assistant for one quarter. Enrollment for two units in this course documents the requirement.

501. Teaching in the Humanities (4)
Consideration of pedagogical applications to teaching of literary, historical, and philosophical texts at the undergraduate level. Pedagogical aids for the teaching of composition and supervised teaching in sections of the undergraduate humanities sequence. *Prerequisite: graduate standing.*

Third World Studies

OFFICE: 3313, Warren College
(619) 534-3276 or (619) 822-0377

Professors

Carlos Blanco-Aguinaga, Ph.D., *Spanish and Latin American Literature*
Jaime Concha, Ph.D., *Spanish and Latin American Literature*
Edward Reynolds, Ph.D., *African History*

Associate Professors

Robert Cancel, Ph.D., *African and Caribbean Literature, Coordinator of Third World Studies*
Ann L. Craig, Ph.D., *Political Science*
Michael P. Monteon, Ph.D., *Latin American History*
Vicente L. Rafael, Ph.D., *Communication: Southeast Asian and Philippine Culture*
Marta E. Sanchez, Ph.D., *Latin American Literature*
Rosaura Sanchez, Ph.D., *Spanish and Latin American Literature, Linguistics*
William Tay, Ph.D., *Chinese Literature*
Carlos Waisman, Ph.D., *Sociology*
Winnie Woodhull, Ph.D., *Literature*

Assistant Professor

Suzanne Brenner, Ph.D., *Anthropology*
Rosemary George, Ph.D., *Literature*
Max Parra, Ph.D., *Mexican Literature*
Oumelbanine Zhiri, Ph.D., *Literature*

Adjunct Professor

Leften S. Stavrianos, Ph.D., *History*

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 Wolrd," 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 choose either an interdisciplinary major with a disciplinary focus (anthropology, economics, history, literature, political science, sociology, etc.) or a specific departmental major within the humanities or social sciences.

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, 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 U.C. 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 *eight* 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 four courses may overlap with the other major requirements. 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 three of the lower-division Third World studies sequence (TWS 21, 22, 23, 24, 25, 26) and three 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 Ameri-

can 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

102. Latin American Societies and Culture

104. Traditional African Societies and Culture

117. Gender across Cultures

125. Contemporary Central America

133. Politics and Modernity: Urban Cultures in Latin America

134. The Cultures of Mexico

135. Indian Society

137. Societies and Cultures of Melanesia

145. Topics in Latin American Societies and Cultures

152. Gandhi: The Man and His Society

162. Peoples of the Near East

166. Family and Society in the Near East

170. Traditional Chinese Society

171. Chinese Familism

172. Culture and Personality in China

173. Chinese Popular Religion

182. Ethnography of Island Southeast Asia

Communication

Com/Cul 181. Colonialism and Culture

History

HILA 100. Colonial Latin America: Era of Conquest

HILA 101. Colonial Latin America: The Mature Colonies

HILA 102. Latin America in the Twentieth Century

HILA 110. Progress and Poverty in South America: 1820–1930

HILA 111. Progress and Poverty in South America: 1930–Present

HILA 112. Economic and Social History of the 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 120. History of Argentina

HILA 121. History of Brazil

HILA 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 164. Political Economy of Argentina

HILA 166. Colloquium–Cuba: From Colony to Socialist Republic

HILA 172. Machismo and Matriarchy: Latin American Social Structure

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 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 163. Cinema and Society in Twentieth-Century China

HIEA 165. The Chinese Village in Transition: 1930–1956

HINE 166. Nationalism in the Middle East

Literature

General

130. Novel and History in the Third World

132. Introduction to African Oral Literature

133. Introduction to Literature and Film of Modern Africa

135. Contemporary Caribbean Literature

136. Latin American Literature in Translation

137. Mexican Literature in Translation

140A. Classical Chinese Literature

140B. Modern Chinese Literature

140C. Contemporary Chinese Literature

142A-E. Earlier Japanese Literature

143A-E. Later Japanese Literature

145. Topics/Japanese Literature

146. Japanese Works/Authors

Spanish

130B. Development of Latin American Literature

131. Spanish American Literature: The Colonial Period

132. Spanish American Literature: Nineteenth Century

133. Spanish American Literature: Twentieth Century

134. Argentine Literature

135. Mexican Literature

136. Peruvian Literature

137. Caribbean Literature

140. Spanish-American Novel

141. Spanish-American Poetry

142. Spanish-American Short Story

143. Spanish-American Essay

144. Spanish-American Theatre

160. Spanish Phonetics

163. Spanish Language in America

172. Indigenista Themes in Spanish-American Literature

173. Spanish American Literary History

Music

126. Introduction to Oral Music

Philosophy

152. Philosophy and Literature

Political Science

112B. Politics, Philosophy, and Social Science Methodology

130B. Politics in the People's Republic of China

130D. Seminar: Chinese Politics

130G. Vietnam: The Politics of the Village

130H. Vietnam: The Politics of Intervention

133A. Introduction of Japanese Politics

133B. Political Economy of the East Asian Newly Industrialized Countries

133D. Japanese Foreign Policy

133E. Public Policy in Japan

134AA-AB. Comparative Politics of Latin America

134B. Politics in Mexico

134C. Peasant Movements and Agrarian Problems in Latin America

134D. Selected Topics in Latin American Politics

134G. Politics in the Andes

134I. Politics in the Southern Cone of Latin America

134J. Labor and Politics in Latin America

134N. Politics in Central America

135A. Ethnic Conflict in the Third World

136A. African Politics

138A. The Political Economy of Urbanization

138B. Politics in Rural Inequality

144AA-AB. Politics in the International Economic Order

144B. Comparative Responses to International Economic Crises

144D. Political Dimensions of International Finance

145B. Conflict and Cooperation in International Politics

146A. The U.S. and Latin America: Political and Economic Relations

146BA-BB. Seminar on Mexico and U.S.-Mexican Relations

146C. U.S.-Latin American Relations and the International Political Economy

146D. Political Parties in Latin America

150A. Seminar: The Political Economy of International Labor Migration

196A-B-C. Fieldwork in U.S.-Mexican Studies

Sociology D: Comparative and Historical

133. Comparative Sex Stratification

151. Comparative Race and Ethnic Relations

158. Islam in the Modern World

158J. Religion and Ethics in China and Japan

179. Social Change

185. Political Economy of Development and Underdevelopment

186. Peasants and Farmers in Society

187. African Society through Film

188A. Community and Social Change in Africa

188B. Chinese Society

188D. Latin America: Society and Politics

188H. Middle Eastern Societies

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

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. Participation in these activities is an excellent way for students to meet faculty, expand their horizons, and plan for future coursework.

The honors seminar is an exciting component of the honors program. It is offered every quarter and is open to all class levels of honors students. Students participating in the honors seminar also are invited to participate in the Price Public Affairs Forum, which invites leading public figures to speak on important issues of great interest. Also, each quarter, honors students enjoy a relaxed and informal evening with the provost at his home.

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 12 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 university-wide and departmental honors, Provost Honors, Thurgood Marshall College Honors, Phi Beta Kappa membership, and participation in small honors classes in mathematics and science.

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 non-profit/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.)

Urban Studies and Planning

OFFICE: Social Science Building, Room 315, North Campus

Professors

Rae L. Blumberg, Ph.D., *Sociology*
Amy Bridges, Ph.D., *Political Science, Director of Urban Studies and Planning Program*
Robert F. Engle, Ph.D., *Economics*
Ramon A. Gutierrez, Ph.D., *Ethnic Studies/History*
Robert M. Kaplan, Ph.D., *Family and Preventive Medicine*
George Lipsitz, Ph.D., *Ethnic Studies*
Hugh G. Mehan, Ph.D., *Sociology/Teacher Education Program*
Michael E. Parrish, Ph.D., *History*

Associate Professors

Steven P. Erie, Ph.D., *Political Science*
Ivan T. Evans, Ph.D., *Sociology*

Assistant Professors

Lisa M. Catanzarite, Ph.D., *Sociology*
Richard G. Kronick, Ph.D., *Family and Preventive Medicine*
Jonathan Holloway, Ph.D., *Ethinic Studies*
Leland T. Saito, Ph.D., *Ethnic Studies*

Supervisor of Field Studies

Keith Pezzoli, Ph.D.

Lecturer

Barbara L. Brody, M.P.H., *Family and Preventive Medicine*

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. Upper-division electives broaden students' social education and introduce students to policy and planning issues.

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, architecture, or design. 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 is not designed as a training program in local government, planning, or design. It 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, or Roosevelt 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; Social Science 60; and twelve courses in upper-division urban studies and planning. S*tudents 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 urban studies and planning adviser to determine whether courses taken elsewhere satisfy USP program requirements.

Lower-Division Requirements

Students majoring in urban studies and planning must complete the introductory sequence USP 1, 2, 3, and Social Science 60.

Upper-Division Requirements

The upper-division requirements in urban studies and planning are:

1. three foundation courses
2. Political Science 160AA Introduction to Policy Analysis
3. 5 upper division courses, of which at least 2 are from the social science list
4. senior sequence of field work and internship
5. either USP 190 Senior Honors Seminar or one additional upper-division course chosen from either the Social Sciences or Policy and Planning list.

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 107. Urban Politics (Political Science 102E) (4)

USP 129. Research Methods: Studying racial and Ethnic Communities (Ethnic Studies 190) (4)

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. Students will not be allowed to register for the internship without having taken the field work course. Students learn how 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. The USP 186 research proposal is a formal plan for the Senior Research Project.

Because USP 187 is 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 3.0 GPA in the major, senior standing, USP 186 and 187, and consent of instructor. Majors who plan to write a senior thesis are encouraged to start thinking about their research topic in the fall of their senior year, and to build on prior course work in choosing their topic.

USP 190. Senior Honors Seminar (4)

SOCIAL SCIENCE REQUIREMENT

Students must choose three courses to complete their upper-division social science requirement. Courses accepted for this requirement include:

USP 102/Economics 135. Urban Economics

USP 103/History (HIUS) 148. American Cities of the Twentieth Century

USP 107/Political Science 102E. Urban Politics

USP 129/Ethnic Studies 190. Research Methods: Studying Racial and Ethnic Communities

USP 133/Sociology C/152. Social Inequality and Public Policy

USP 135A. Black Politics and Protest 1885–1941

USP 135B. Black Politics and Protest Since 1941

USP 136. Sociology C/148M. Labor Market Inequality and Public Policy

USP 151/History (HIUS) 186. Special Topics in the History of Los Angeles

USP 159/Anthropology (ANRG) 119. Modern and Postmodern Urbanism

USP 160/History (HIUS) 154. Western Environmental History

USP 161/History (HIUS) 114. California History

Economics 116. Economic Development

Economics 130. Public Policy

Economics 134. Regional Economics

Economics 136. Human Resources

Economics 139. Labor Economics

Economics 150. Economics of the Public Sector: Taxation

Economics 151. Economics of the Public Sector: Expenditures

Economics 152. Topics in Public Economics

Economics 155. Economics of Voting and Public Choice

Economics 179. Decisions in the Public Sector

Ethnic Studies 102. Racial Inequality in America: A Comparative Historical Analysis

Ethnic Studies 105. Ethnic Diversity and the City

Ethnic Studies 106. Ethnoracial Transofrmations of U.S. Communities

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 182/History (HIUS) 165. Segregation, Freedom Movements, and the Crisis of the Twentieth Century

Ethnic Studies 184. Black Intellectuals in the Twentieth Century

History (HIEU) 124. The City in Italy

History (HILA) 115. Latin American City, a History

History (HIUS) 137. The Built Environment in the Twentieth Century

History (HIUS) 140/Economics 158A. Economic History of the United States I

History (HIUS) 141/Economics 158B. Economic History of the United States II

History (HIUS) 155/Environment 110. Environmental Law

History (HIUS) 180. Immigration and Ethnicity in Modern American Society

Political Science 100G. American Politics and Public Policy

Political Science 100H. Race and Ethnicity in American Politics

Political Science 102J. Advanced Topics in Urban Politics

Political Science 103A. California Government and Politics

Political Science 106A. Politics and Bureaucracy

Political Science 138A. Political Economy of Urbanization

Political Science 160AA. Introduction to Policy Analysis

Political Science 160AB. Introduction to Policy Analysis

Psychology 104. Introduction to Social Psychology

Psychology 186. Psychology and Social Policy

Sociology A/100. Classical Sociological Theory

Sociology B/112. Social Psychology

Sociology C/121. Economy and Society

Sociology C/122. Sociology of Organization

Sociology C/123. Sociology of Work

Sociology C/125. Minorities in the Schooling Process

Sociology C/130. Families and Communities in American Society: Cross-Cultural Forms

Sociology C/132. Gender and Work

Sociology C/136B. Sociology of Mental Illness in Contemporary Society

Sociology C/141. Crime and Society

Sociology C/144. Forms of Social Control

Sociology C/148. Political Sociology

Sociology C/148C. Power, Culture, and Social Revolt

Sociology C/148E. Ethnicity, Nationalism, and Politics

Sociology C/148I. Collective Identity and Group Formation

Sociology C/148L. Inequality and Jobs

Sociology C/150L. The Politics of Language and Ethnicity

Sociology C/151M. Chicanos in American Society

Sociology C/159. Special Topics in Social Organizations and Institutions

Sociology C/180. Social Movements and Social Protest

Sociology D/151. Comparative Race and Ethnic Relations

Sociology D/179. Social Change.

Sociology D/184. Societal Evolution and Economic Development

POLICY AND PLANNING REQUIREMENT

Students must choose three courses to fulfill their upper-division policy and planning requirement. Courses accepted for this requirement include:

USP 105. Environmental and Urban Planning: The U.S.-Mexican Border

USP 106/TEP130. Public Service: Practicum in Learning

USP 123/Economics 133. Housing Policy

USP 124. Land Use Planning

USP 133/Sociology C/152. Social Inequality and Public Policy

USP 143. 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

USP 170. Planning Theory & Practice

USP 171. Sustainable Development

USP 173. History of Urban Planning and Design

USP 175. Environmental Problems of Urban Studies

USP 179. The Form of Design: Creation and Image Practice

USP 180. Culture and the Meaning of Design

Anthropology (ANBI) 132/Biology (BIEB) 176. Conservation and the Human Predicament

Anthropology (ANGN) 143. Education and Culture

Economics 130. Public Policy

Economics 131. Economics of the Environment

Economics 138A-B. Economics of Health

Economics 180. Real Estate Finance

Philosophy 122. Bio-Medical Ethics

Philosophy 127. Professional Ethics

Political Science 160AA. Introduction to Policy Analysis

Political Science 160AB. Introduction to Policy Analysis

Political Science 166F. The American Welfare State

Sociology B/117. Language, Culture, and Education

Sociology C/126. Social Organization of Education

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

Visual Arts 107E. Art in the Landscape

The Minor Program

The urban studies and planning minor consists of six courses in urban studies and planning, selected with the prior approval of a faculty adviser. Students who wish to minor in urban studies may do so by taking any three courses from among the lower-division sequence and the foundation courses, and three 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.

COURSES

LOWER DIVISION

1. Comparative Urbanization (4)
Historical and comparative survey of cities throughout the world. Ecological, social, economic, technological, and cultural determinants of city location, form, growth, and decline. Urbanization movement following the Industrial Revolution. Role of the city as a force of culture and civilization.

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

102. Urban Economics (4)
(Same as Economics 135.) Urban economic problems and public policies to deal with them. *Prerequisite: Economics 1A-B or 2A-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.*

105. Environmental and Urban Planning Problems: The U.S.-Mexico Border (4)
Course addresses the key environmental and city planning problems facing the U.S.-Mexico border region. After establishing a historical, geographic, and demographic context for the border region, the course focuses on the following themes: comparative economic base, political systems, environmental problems, city planning issues, twin cities, San Diego, and Tijuana. *Prerequisite: upper-division standing or consent of instructor.*

106. Public Service: Practicum in Learning (4)
(Same as TEP 130.) The relationship between teaching and learning; the relationship between school and community; social and political organization of the schools; philosophical, sociological and political issues which relate to the U.S. educational system, and the academic achievement of children are examined. Field and academic work focus on culturally diverse children in San Diego Schools. Students tutor at Valencia Park Elementary School. *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. *Prerequisite: upper-division standing or consent of instructor.*

123. Housing Policy (4)
(Same as Economics 133.) Examines housing markets and the U.S. housing finance system. Evaluates federal and local policies and tax incentives to promote housing production, encourage homeownership, provide decent shelter for low-income families, and improve conditions in deteriorated neighborhoods. *Prerequisite: One introductory micro- and one introductory macro-economics course.*

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. Ethnographic Field Work in Racial and Ethnic Communities (4)
(Same as ETHN 107.) This course is a research methods course examining social, economic, and political issues in ethnic and racial communities through ethnographic field work which places the researcher directly into the social world under study. Topics are examined through field work and library research. *Prerequisite: upper-division standing or consent of instructor.*

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.*

135A. 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. *Prerequisite: upper-division standing or consent of instructor.*

135B. 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. *Prerequisite: upper-division standing or consent of instructor.*

136. Labor Market Inequality in Los Angeles and the Border Region
(Same as SOC C/148M.) Focus on the changing labor force and occupational structure of Los Angeles and the Mexican border. We apply theoretical work to recent changes, with special attention to immigrant and minority employment, economic restructuring, and changes in the international division of labor. *Prerequisite: upper-division standing or consent of instructor.*

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.* (W)

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.* (F)

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) (Not offered in 1996–97.)

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 popu-

lations, recent immigrants, and persons with severe disabling mental illnesses will be studied. Offered in alternate years. *Prerequisite: upper-division standing or consent of instructor.* (S)

151. Special Topics in the History of Los Angeles (4)
(Same as HIUS 186.) This course will be a thematic examination of special topics in the history of Los Angeles. Special attention will be played to weaving together issues of ethnicity, gender, politics, and the environment. *Prerequisites: department stamp and permission of instructor.*

159. Modern and Postmodern Urbanism (4)
(Same as ANRG 119.) Course critically examines theories of modern and postmodern urbanism in the context of Southern California, with reference to urbanization elsewhere. Topics include peripheral development, public space, urban experience, anti-urbanism, multicultural citizenship, social and spatial polarization, interactive architecture, "third-worldization." *Prerequisite: upper-division standing.*

160. Western Environmental History (4)
(Same as HIUS 154.) American settlers' interaction with the western environment. Focus on the distinction between objective environmental science and the subjective views of settlers and historians. *Prerequisite: upper-division standing or consent of instructor.*

161. California History (4)
(Same as HIUS 114.)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. *Prerequisite: upper-division standing.*

170. Planning Theory and Practice (4)
Examines urban and regional planning theory and practice from an ecological, historical, and comparative perspective. Focuses on contributions of political ecology, utopianism, anarchism, bioregionalism, economics, and ethics. Identifies current planning strategies that aim to link economy, ecology, and community in sustainable development. *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.*

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.*

175. Environmental Problems of Urban Studies (4)
This course examines urbanization's impact on the natural resources of California, and ways natural resources of urban areas are being protected and planned for by government agencies. Evaluation of the current status of resource-related planning. Politics of resource protection; preserving natural areas; air and water quality issues; protecting agricultural lands and guiding the location of new development. *Prerequisite: upper-division standing.*

179. The Form of Design: Image, Creation, and Practice (4)
Our physical surroundings are shaped by design, from lightbulbs and corporate logos to chairs, buildings, parks, streets, and cities. This course seeks to find the intention in everyday objects and the aesthetic in those that go beyond function. Working from simple to complex elements, a series of case studies illuminates a design process, the designed object, and the role of the designer. Lectures and projects will encourage the development of visual literacy and critical skills through hands-on design explorations.

180. Culture and the Meaning of Design (4)
An architect's view of the parallel evolution of culture and the designed environment. Through a series of topical lectures and graphic exercises, this course will help to interpret the often overlooked role of design as we move from a society based on the coincidence of power and place to today's polycentral culture of performance.

186. Urban Field Work Seminar (6)
Introduces students to the theory and practice of social research. Examines the structuring of inquiry and observation, including nonobtrusive measures, interviews, and participant observations. Introduces techniques for logging data, including field notes and filing systems. The requirements of the course include both archival and field research assignments. *Prerequisites: USP major and senior status.*

187. Urban Studies Internships (6)
Students spend ten hours per week as interns with a local public or private agency of their choice. The course provides a framework in which students examine the theoretical as well as practical aspects of their internship's experience. Final requirement calls for an essay, and students can meet this requirement by writing an evaluation, a client-oriented paper, or a research paper. *Prerequisite: USP 186.*

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 3.0, and permission of instructor.*

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

Professors

David Antin, M.A., *Professor Emeritus*
Eleanor Antin, B.A.
Harold Cohen, *Diploma of Fine Arts, Professor Emeritus*
Steve Fagin, M.A.
Manny Farber, *Professor Emeritus*
Jean-Pierre Gorin, *Licence de Philosophie*
Helen Mayer Harrison, M.A., *Professor Emeritus*
Newton Harrison, M.F.A., *Professor Emeritus*
Louis Hock, M.F.A.
Madlyn M. Kahr, Ph.D., *Professor Emeritus*
Allan Kaprow, M.A., *Professor Emeritus*
Kim MacConnel, M.F.A.
Babette Mangolte
Patricia Patterson
Faith Ringgold, M.A.
Jerome Rothenberg, M.A.
Italo Scanga, M.A.
Jehanne Teilhet-Fisk, Ph.D., *Professor Emeritus*

Associate Professors

Jack Greenstein, Ph.D.
Standish Lawder, Ph.D., *Professor Emeritus*
Fred Lonidier, M.F.A.
Sheldon Nodelman, Ph.D.
Ernest Silva, M.F.A.
Susan Smith, Ph.D.
Phel Steinmetz, *Academic Senate Distinguished Teaching Award*

Assistant Professors

Geoffrey Batchen, Ph.D.
Sheldon Brown, M.F.A.
Thomas Allen Harris, B.A.
John Welchman, Ph.D.

Lecturer

Claudio Fenner-Lopez, M.A., *Lecturer SOE Emeritus*

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, and art critics. It also provides students the initial skills required for teaching and work in museums, television, and the commercial film and photography 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, or photography, are offered also.

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 new Visual Arts Facility located in Eleanor Roosevelt 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 black and white and color portable video camera and editing equipment, as well as black/white and color video studios. The department also has the in-house capacity to process black and white 16mm film. Additional film equipment available includes an animation stand, optical printer, two sound-mixing studios, and a suite of film editing labs. Courses in computing in the arts take place in the Silicon Graphics/Mac lab located at the new Visual Arts Facility.

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 new Visual Arts Facility, are directed by graduate students.

College Requirements

The Department of Visual Arts teaches courses applicable toward the Muir and Warren general-education requirements, the Marshall humanities requirement, the Eleanor Roosevelt and Revelle fine arts requirements, and the Revelle minor.

Minor in Visual Arts

The Department of Visual Arts offers minors in six areas of study: studio painting/drawing/sculpture, photography, European art history, Non-Western art history, media history/criticism and film/video. A minor consists of six specific courses of which at least three 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 classes to complete the minor.

Residency Requirements

A minimum of two-thirds of the course work completed for the major must be taken as a registered student 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 lower-division requirements.

Visual Arts 111, Structure of Art, is required course for all students, including transfer students.

NOTE: Rarely are transfer credits accepted toward fulfilling upper-division requirements in any of the three majors.

Major Requirements

Twenty courses are required 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 computing for the arts.

Group I: Lower-Division

Foundation Level

Six courses required:

1 Introduction to Art Making
2 Introduction to Art Making
3 Introduction to Art Making
14 Nineteenth- and Twentieth-Century Art

Choice of any two:

11 Western Art I: Prehistoric to Medieval
12 Western Art II: Medieval to the Present
13 Non-Western Art
84 History of Film

Group II: Upper-Division

Foundation Level

111 Structure of Art*

*Required for all Visual Arts majors.

Beginning Level

Four courses required (Note: It is recommended that all foundation-level courses be completed prior to enrollment in upper-division courses). Choose four from:

60 Introduction to Photography
70 Introduction to Media
104A Performance
105A Beginning Drawing
106A Beginning Painting
107A Beginning Sculpture

NOTE: Students planning a program involving film and/or video must take VIS 70, Introduction to Media.

Group III: Upper-Division Studio

Intermediate and Advanced Level

Five courses required. Any upper-division studio courses, other than those listed under

Group II, such as Intermediate Drawing or Advanced Painting satisfy these requirements. Check with department for full course listings.

Group IV: Upper-Division Non-Studio

Four courses required. Upper-division media history/criticism and art history/criticism courses such as Hard Look at the Movies, Renaissance Art, or Contemporary Art satisfy these requirements. Check with department for full course listings.

Art History/Criticism Major

The major in art history 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 manifestations 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

7 courses required

1, 2, or 3 Introduction to Art Making
11 Western Art I: Prehistoric to Medieval
12 Western Art II: Medieval to the Present
13 Non-Western Art
14 Nineteenth- and Twentieth-Century Art
60 Introduction to Photography
84 History of Film

ADVANCED LEVEL—UPPER-DIVISION

13 courses required

GROUP I—Required Courses

2 courses

These two courses are required for all art history and criticism majors:

111 Structure of Art*
112 Art Historical Methods

NOTE: Normally VIS 112 is taken during the second year after completing requirements under Group II—Distribution Requirement.

* Required of all Visual Arts majors.

GROUP II—DISTRIBUTIONAL REQUIREMENT

5 courses

One course from each of the following areas:

A. **Criticism and Theory**

113A History of Criticism I
113B History of Criticism II
113C History of Criticism III

B. **Ancient**

120A Greek Art
120B Roman Art
120C Late Antique Art

C. **Medieval/Renaissance/Baroque**

122A Art of the Middle Ages
122B Renaissance Art
122C Baroque Art

D. **Modern**

124A Art of the Eighteenth Century
124B Art of the Nineteenth Century
124C Art of the Twentieth Century

E. **Non-Western**

126A African and Afro-American Art
126B Polynesian Art
126C Melanesian Art
126D Art of the Southwest American Indians

GROUP III—AREA SPECIALIZATION

2 courses

Two courses in one area of specialization from the following list. At least one of these must be a seminar (indicated by *). In seminars, students will be expected to give reports and undertake independent research.

A. **Criticism and Theory**

All courses listed under Group II.A., as well as:

113D History of Criticism IV
114 Art Criticism
*117 Narrative Structure in the Visual Arts
118 Landscapes, Grottos, and Fountains
119 Issues in the History of Architecture
128A Topics in Art Criticism and Theory
*129A Special Problems in Art Criticism and Theory

B. **Ancient**

All courses listed under Group II.B., as well as:

121A Prehistoric Art
128B Topics in Ancient Art
*129B Special Problems in Ancient Art

C. **Medieval/Renaissance/Baroque**

All courses listed under Group II.C., as well as:

123A Italian Art of the Early Renaissance
123B High Renaissance Art
123C Michelangelo
*123D The City in Italy
123F Castles, Cathedrals, and Cities
123G Art of the Age of Jan van Eyck
123H Images of Women in Medieval and Renaissance Art
*123I The Illuminated Manuscript in the Middle Ages
*123J Jan van Eyck
*123K Albrecht Dürer and the First Media Revolution
123L History of Prints and Printed Images
123M Baroque Architecture
*123N Baroque Masters
128C Topics in Medieval, Renaissance, and Baroque Art
*129C Special Problems in Medieval, Renaissance, and Baroque Art

D. **Modern**

All courses listed under Group II.D., as well as:

125B Modernist European Painting
125C Matisse and Picasso
125D Contemporary Art
*125E History of Performance Art
125F History of Twentieth-Century Sculpture
*125G American Folk Art
128D Topics in Modern Art
*129D Special Problems in Modern Art

E. **Non-Western**

All courses listed under Group II.E., as well as:

*127B Western and Non-Western Rituals and Ceremonies
*127C Female Artists and Female Imagery
127D Primitivism and Exoticism in Modern Art
128E Topics in Non-Western Art
*129E Special Problems in Non-Western Art

GROUP IV—ELECTIVES

4 courses

Four additional courses in art history and criticism from the following:

Art history and criticism: Any course from Groups II and III above, numbered VIS 113A-VIS129E, and/or

History and criticism of film, photography and video: Any course from the following:

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
157 Video History and Criticism
158 Histories of Photography

*indicates seminar

Media Major

The program is designed for students who want to become creative videomakers, filmmakers, and photographers. It combines hands-on experience of making art 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 commercial film, television or photography, or to develop as independent artists.

FOUNDATION LEVEL—LOWER-DIVISION

6 courses required

Group A

1, 2, *or* 3 Introduction to Art Making
14 Nineteenth- and Twentieth-Century Art
84 History of Film

Group B

60 Introduction to Photography
70 Introduction to Media I (Technique/History)
71 Introduction to Media II (Theory)

All six courses listed under Groups A and B are required. Any and all courses except VIS 70 and VIS 71 can be taken simultaneously. VIS 70 is prerequisite for use of the Media Center. No further production courses can be taken until both 70 and 71 are completed.

INTERMEDIATE LEVEL—UPPER-DIVISION

8 courses total required

Group A

5 courses required

111 Structure of Art*
174 Media Sketchbook

Both VIS 111 and VIS 174 are required prerequisites to further study. Additionally, students must complete requirements from either the Film/Video or Photography Emphasis listed below. Two of these courses must be completed before taking advanced courses. In the case of the Photography Emphasis, students should select a third course from those listed under the Film/Video Emphasis.

*Required of all Visual Arts majors.

Film/Video Emphasis

172 Studio Video
176 Introduction to Filmmaking
177 Scripting and Editing Strategies

Photography Emphasis

164 Photographic Strategies
165 Camera Techniques

NOTE: Enrollment in production courses is limited to two per quarter. Production courses are numbered VIS 109, VIS 131, VIS 164-166, VIS 172-177, and VIS 180-187.

Group B–History, Criticism, and Theory

3 courses required

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
157 Video History and Criticism
158 Histories of Photography

NOTE: One course from VIS 128A-E, Topics in Art History and Criticism, can be substituted for a Group B requirement.

VIS 158 is required for all students with a photography emphasis.

ADVANCED LEVEL—UPPER DIVISION

6 courses required

180 Documentary Media
183 Narrative Media

Both of the above are required. Additionally, four electives must be taken. VIS 180 and VIS 183 are repeatable for credit as electives, or choose four from the following list:

Electives

Both of the above advanced courses are required before VIS 109 or 131 can be taken. The following two courses can be taken only with the approval of the instructor and are not required:

109 Advanced Projects in Media
131 Special Projects in Media

Film and Video Electives:

181 Sound and Lighting
182 Advanced Editing
186 Advanced Filmmaking Strategies
187 Animation

Photography Electives:

166 Advanced Camera Techniques

Master of Fine Arts

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, theory. The scope of the UCSD program includes painting, sculpture, performance, environmental art, photography, film, video, and computer 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 de-

partment 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 the working out of 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, photography, and the electronic media.

The program includes formal education in lecture and seminar courses as well as study groups and studio meetings. 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 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 approximately 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, 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 on or before February 1, 1997. 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 or fourth 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 fifth quarter.

Seventy-two units of course work, including a three-unit apprentice teaching course, are required. Students may select twenty-four of these units (six courses) from upper-division course offerings. (See listings in this catalog.) Specific information on course distribution requirements can be obtained from the department.

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 tenured 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 office of the Department of Visual Arts.

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 (4)
An introduction to the process of art making with special reference to the generation of meaning through the juxtaposition of given elements and the interaction between such elements and their immediate and wider contexts. Materials,

objects, images, and experience of everyday life will be utilized. This course is offered only one time each year.

2. Introduction to Art Making (4)
An introduction to the process of art making utilizing the transaction between people, projects, 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 (4)
This course will employ drawing, watercolor painting, found photographs, and verbal material to construct serial and narrative work. Art forms such as cartoon strips, illustrative manuscripts, and photojournalist works will be analyzed and used as models. Studio work will vary in size and format from small hand-made books and scrolls to large wall pieces. This course is offered only one time each year.

11. Western Art I: Prehistoric to Medieval (4)
Works of art are tools through which humanity has struggled to understand and deal with the world, with society, and with the self. This course provides an overview of the development of Western art in its principal phases from the earliest times to the twelfth century A.D., and serves as the foundation for subsequent, more detailed studies in the history of art. Visual images first appear in the cave paintings and carvings of the hunting people of Ice Age Europe–an art of astonishing power and mysterious meaning. The village cultures which subsequently developed in the Near East grew in the Bronze Age into great civilizations, urban, literate, and highly structured, which gave rise to the first monumental art, expressing the new power and confidence of human society. The rational geometry of this Bronze Age art was transformed in the art of classical Greece into the vehicle for a heightened individual self-consciousness, which became more complex and more subjective in the imperial art of Rome. During the early Middle Ages–Byzantine, Carolingian, and Romanesque–new visions of otherworldly spirituality dissolved this classical formal language and recast it as the foundation of later European art. The arts of these cultures will be examined through the analysis of major monuments of architecture, sculpture and painting, with specific attention to the communicative function of the work of art as seen in relation to contemporary society and culture. This course is offered only one time each year.

12. Western Art II: Medieval to the Present (4)
In the twelfth century, European artists created the first unified and universal visual language since classical antiquity. Though this Gothic style was rejected by later artists, it changed the image of humanity and of the world. Donatello, Leonardo, Raphael, Michelangelo, and others in the Renaissance forged an art of extraordinary power out of a confluence of Gothic visual habits and the classical vocabulary which they sought to reclaim. For nearly two centuries, the language of these early modern artists was extended in scope and adapted to new modes of seeing and thinking by baroque artists such as Caravaggio, Rubens, Rembrandt, Velazquez, and Vermeer. The age of democracy and industrialization, ushered in by the American and French Revolutions, gave rise to a rapid succession of styles. Neo-classicism, romanticism, realism, impressionism and post-impressionism, cubism, dada and surrealism are products of the struggle to find a mode of artistic expression for a world of changing values, new institutions, and unprecedented diversity. Abstract expressionist, pop, minimalist and conceptual artists have taken on the task of grappling with the post-1945 world. This course is offered only one time each year.

13. Non-Western Art (4)
Traditional art forms from the Arctic and Northwest Coast, Melanesia, Polynesia, and West Africa will be considered along with ritual arts, body decoration, and architecture. By examining the arts, symbolism, and myths of nonliterate societies, alternative models emerge both for the formal language of the work of art and for its broader social functions. This course is offered only one time each year.

14. Nineteenth- and Twentieth-Century Art (4)
In Europe of the later eighteenth century, the cultural and political upheavals of the American, French, and early Industrial Revolutions provoked such artists as Goya, Blake, and David to produce daring works which broke with academic painting. From then on, the world and the arts changed rapidly, and along with them the nature of the art audience and art market: a new middle-class art public emerged as did the new structures of museums, galleries, and criticism. Neo-classicism, romanticism, realism, impressionism, and post-impressionism–represented by such artists as Ingres, Delacroix, Courbet, Bonheur, Monet, Degas, Cassatt, Gauguin, Van Gogh, Rodin, and Cezanne–developed under these new economic, political, and artistic circumstances. During the twentieth century, bold experiments with new techniques of representation such as fauvism (Matisse) and cubism (Picasso, Braque), with abstraction (Kandinsky, Taeuber-Arp, Mondrian, Malevich) and in dada and surrealism (Duchamp, Miro, Kahlo) with the energies of the irrational and the unconscious succeeded and interacted upon one another, posing new questions about the nature of art and the role of the artist in society. Architectural practice and theory was transformed by the coming of the international style and the teachings of the Bauhaus. The course will end with a study of art since World War II, including American abstract expressionism (Pollock, de Kooning, Krasner), the subsequent international movements of pop, minimal, conceptual and performance art, and the recent questioning of the established history and institutions of art by the Third World and women's art movements. This course is offered during spring quarter only.

40. Introduction to Computing in the Arts (4)
An introduction to the use of computers in art making. Students create works with images, texts, and animation, using a variety of computer-based tools, provoking a discourse on the theoretical issues involved in using computers to make art. *Prerequisite: none.* This course is offered only one time each year.

41. Introduction to Programming–Part A (4)
Introduction to the fundamentals of the UNIX operating system and particularly to the "VI" editor. The course is given in the C language, and presents its syntax up to the use of two-dimensional arrays as representations of graphic events and of character strings for text manipulation. Stress throughout is upon the use of conditionals both in algorithmic design and in constructing nondeterministic programs. *Prerequisite: VIS 40.* This course is offered only one time each year.

42. Introduction to Programming–Part B (4)
This part of the course focuses upon dynamic storage allocation and upon the use of structures for the representation of complex types, lists, and trees. Emphasis is upon program design, and upon heuristic rather than algorithmic procedures. The second part of the quarter will be devoted to major projects specified by students, and to class discussion of issues arising in the design of those projects. *Prerequisite: VIS 41.* This course is offered only one time each year.

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. Materials fee required.

70. Introduction to Media I (4)
As the first part to a two-part course sequence, this course provides a technical foundation and theoretical context for all production-oriented film and video studies. During laboratory periods specific group exercises will be performed with 1/2" and 3/4" video equipment. Completion of 70 is necessary to obtain a media card. Materials fee required.

71. Introduction to Media II (4)
As the second part to a two-part course sequence, this course emphasizes idea development and the analysis of the creative processes. The general principles of film and electronic media as language systems, genre, the notion of a critical attitude, and the social effect/function of media will be covered. Small student groups will produce short, well thought-out projects. Materials fee required. *Prerequisite: VIS 70.*

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.

90. Undergraduate Seminar (1)
This seminar will introduce undergraduate students, especially freshmen and sophomores, to a variety of issues and topics organized around the research interests of faculty members.

UPPER-DIVISION

104A. Performance (4)
A workshop for artists to extend their art-making possibilities through use of their own bodies as both physical and psychological material and its potential for interaction with other human and nonhuman materials. Includes study of contemporary artists already working in this area. *Prerequisites: Two from VIS 1, 2, 3 and either 14 or 111.*

104B. Audience-Oriented Performance (4)
A continuation of techniques and viewpoints developed in Visual Arts 104A but with an emphasis on performing for audiences. Autobiographical (solo) and social (group) performance, narrative performance, objects and spaces that perform, games and entertainments, rituals and transcendental performance are among the topics that may be covered. *Prerequisite: VIS 104A or consent of instructor.*

104C. Performance of Everyday Life (4)
This course deals with that branch of performance art which is not based on traditional theatrical elements, but attempts to interact with everyday life. It explores activities carried out without audiences in the everyday world rather than in a staging area, gallery, or art studio. May be repeated once for credit. *Prerequisite: VIS 104A or consent of instructor.*

105A. Beginning Drawing (4)
A course in beginning drawing covering line, value, texture, gestures, forms, and composition. These concepts will be introduced by the use of models, still life, and landscapes. The different media that will be used include charcoal, pencil, ink, and conte. *Prerequisites: Two from VIS 1, 2, 3 and either 14 or 111.*

105B. Intermediate Drawing (4)
A continuation of Visual Arts 105A. The student will be exposed to a wider variety of means in representation. The connotational range of different sorts of "marks" and represented "spaces" will be explored. May be repeated once for credit. *Prerequisite: VIS 105A or consent of instructor.*

105C. Advanced Drawing (4)
For advanced students. Students will be given the opportunity to explore the relation between their own energy and idiosyncrasy as draftsmen-artists and the quasi-objective demands of representing various types of real and virtual space. May be repeated once for credit. *Prerequisites: VIS 105A and one additional upper-division drawing course or consent of instructor.*

105E. Animal Drawing (4)
A studio course which develops visual knowledge of and skill in capturing the form, movement, and texture of birds, animals, and fish. Special emphasis will be placed on understanding the environment of the animals and their behavior in that environment. The class will meet alternately on campus, at the zoo, the Museum of Natural History, Scripps Aquarium, and local farms. Students will be expected to carry out given assignments as well as initiate their own projects. May be repeated once for credit. *Prerequisite: VIS 105A or consent of instructor.*

105F. Calligraphic Drawing (4)
This is a studio course exploring for contemporary purposes such verbal-visual art forms as Japanese calligraphy and the figurative drawing which grows out of it, Persian manuscripts, surrealist concrete poetry, and American cartoons which operate equally through text and image. *Prerequisite: VIS 105A or consent of instructor.*

106A. Beginning Painting (4)
A studio course focusing on the problems involved in transferring information and ideas onto a two-dimensional surface. Specific assignments to be determined by the professor. *Prerequisites: Two from VIS 1, 2, 3 and either 14 or 111.*

106B. Intermediate Painting (4)
A studio course in painting, stressing individual creative problems. Specific problems to be investigated will be determined by the individual professors. May be repeated once for credit. *Prerequisite: VIS 106A or consent of instructor.*

106C. Advanced Painting (4)
A studio course in painting, stressing individual creative problems. May be repeated once for credit. *Prerequisites: VIS 106A and one additional upper-division painting course or consent of instructor.*

106D. Beginning Representational Painting (4)
This is a studio course which aims to examine the options open to a painter who wishes to work with pictorial subject matter. Participants will be asked to analyze their artistic directions with respect to format, drawing, subject, and execution. Instruction will be given in all these areas. Students will be expected to research assigned artists and art forms. May be repeated once for credit. *Prerequisite: VIS 106A or consent of instructor.*

106E. Intermediate Representational Painting (4)
A continuation of Visual Arts 106D on the intermediate level. May be repeated once for credit. *Prerequisite: VIS 106D.*

107A. Beginning Sculpture (4)
A studio course focusing on the problems involved in transferring information into three-dimensional objects. Specific problems to be investigated will be determined by individual professors. *Prerequisites: Two from VIS 1, 2, 3 and either 14 or 111.*

107B. Intermediate Sculpture (4)
An intermediate studio course in sculpture, stressing individual problems. Specific problems to be investigated will be determined by individual professors. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

107C. The Decorative Object and the Decorative Environment (4)
This course will focus on the decorative object, tableau, and the decorative environment. Students will explore formal sculptural issues as applied to the concept of decoration in a series of studio problems. Class discussion will include some of the historical and cultural issues surrounding decoration. Materials will include: found objects, furniture, cardboard, paints, cloths, etc. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

107D. Representational Sculpture (4)
Representational Sculpture will work with the model, found objects, photography, and drawing. Discussion and slides will be used to examine the history and theories of representation. Practice will address problems of narration. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

107E. Art in the Landscape (4)
A studio course exploring any kind of sculpture that can be placed in the landscape, ranging from micro and actual objects to monumental installations, and including trails, meditation spaces, shelters, micro and macro parks and plazas–any kind of three-dimensional work claiming the external environment, natural or urban, as its context. *Prerequisite: VIS 107A or consent of instructor.*

107F. Tableau (4)
Tableau will focus on groupings, clusters, and arrays that have narrative content. The sculptural issues of space, scale, and color will be addressed. Class discussion will refer to the function of tableau in diverse art forms. These include not only sculpture but painting, theater, film, and performance. Materials will include found objects as well as those specifically manufactured from cardboard, wood, canvas, and other simple materials. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

107G. Earthworks to Ecological Art (4)
Sculpture and the Natural Environment. This course will focus on the use of the earth as grounds for art-making. An assessment of recent art in this area as well as underlying historical and cultural attitudes toward siting and the earth will form part of the class discussion. Projects will include sketches, photographs, drawings, proposals, and models. A final project may require works on sites available in university environs. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

107H. The Object as Sculpture (4)
This class consists of creating three-dimensional objects by a variety of basic techniques such as building negative molds out of cardboard from which a positive object is cast in molding plaster. We will also use wood, cardboard, and "found" materials/objects to explore a basic attitude toward sculpture. Besides the studio work, there will be lectures and slides with emphasis on contemporary work. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

107I. Environment as Painting/Installation as Painting (4)
The practice of painting as a generator of environmental space in transaction with architecture. The course deals with problems peculiar to sculptural implications of painting. Reference will be made to precedents in the mural programs of the past as well as to contemporary installations. Scale models of existing hypothetical architectural space and graphic aids such as drawing, photography, and collage may be utilized. May be repeated once for credit. *Prerequisite: VIS 106A, VIS 107A, or consent of instructor.*

107J. Materials and Construction Sculpture (4)
An intermediate course exploring the sculptural meanings obtainable through the choice of various types of materials and their combinations; and through various modes of joining, assembly, and ordering. May be repeated once for credit. *Prerequisite: VIS 107A or consent of instructor.*

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.*

109. Advanced Projects in Media (4)
A production course for serious upper-division media students. Individual or group projects will be completed over one or two quarters. A specific project organized by the student(s) will be realized during this course, with the instructor acting as a close adviser and critic. Formal concept papers or scripts must be completed and approved by the instructor prior to enrollment. May be repeated twice for credit. *Prerequisite: consent of instructor.*

110. Artists' Books (4)
This studio course, in which artists make and talk about books, is open to persons with backgrounds in painting, photography, sculpture, conceptual art, etc. Genre studies will include comic books, journals, morality tales, manifestos, etc. May be repeated once for credit. *Prerequisites: two upper-division courses in area, or consent of instructor.*

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 winter 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. *Prerequisite: one upper-division art history and criticism course; two recommended.*

113A. History of Criticism I: Classical through Renaissance (4)
This course will emphasize the origins of Western art critical thought with readings in the philosophical literature of antiquity. The theories of representation, of beauty, and of expressivity will be examined in the works of Plato and Aristotle. The theory of style will be studied in the rhetorical writings of Aristotle, Plutarch, Longinus, in Vitruvius' work on architecture and in Pliny's chapters on the history of art. Attention will be given to Augustine and the Church Fathers. Writings of the Middle Ages will be illustrated by readings in Villard de Honnecourt, in Theophilus Presbyter, and in Cennino Cennini. Some attention may be paid to writings by Ghiberti, Alberti, and Aretino. *Prerequisite: none; courses in art history and criticism recommended.*

113B. History of Criticism II: The Enlightenment and The Early Modern Age (4)
After a brief survey of selected seventeenth-and eighteenth-century texts, consisting mainly of the writings of connoisseurs, the course will concentrate on the newly emergent philosophical and art critical discourse in France, Germany, and England, with readings in such philosophical works as Kant's Critique of Judgment, Hegel's Esthetics, Kirkegaard's Either/Or, and

Nietzsche's Birth of Tragedy. Art critical writings will include selections from Diderot, Winckelmann, Reynolds, Stendhal, Baudelaire, Champfleury, Mallarme, Ruskin, Morris, Wilde, and Pater. Writings of various artists from Delacroix to Whistler and Van Gogh will also be considered. *Prerequisite: none; courses in art history and criticism recommended.*

113C. History of Criticism III: The Twentieth Century (4)
This course will analyze the multiple currents of twentieth-century art critical discourse. Philosophical writers such as Croce, Dewey, Heiddegger, Wittgenstein, and Cavell, Marxist critics such as Marx, Engles, Trotsky, Benjamin, Lukacs and Brecht, and French structuralist writers such as Barthes, Derrida, and Foucault may be considered. *Prerequisite: none; courses in art history and criticism recommended.*

113D. History of Criticism IV: Contemporary Criticism (4)
A course in post-World War II criticism, primarily American. The early writings of Rosenberg and Greenberg on abstract expressionism will constitute the beginning course readings, followed by Greenberg's later, widely influential writings of the 1960s. Other points of view by such writers as Lippard, Burnham, Kozloff, and Krauss may be studied as well as the critical writings of artists such as Newman, Reinhardt, Judd, Smithson, and Morris. Influential magazines and journals may be examined. *Prerequisite: none; courses in art history and criticism recommended.*

114. Art Criticism (4)
This course is intended to develop critical approaches to contemporary art. It will investigate contemporary forms of art criticism, stressing both traditional and alternate points of view. Outside field trips and critical writings will be assigned. May be repeated once for credit. *Prerequisite: consent of instructor.*

117. Narrative Structures in the Visual Arts (4)
How can a fixed image represent events in time? The strategies of story telling and their consequences for the meaning of works of art will be investigated. Content of the course will vary: Ancient, Medieval, Renaissance, Baroque, or Modern Art may be emphasized. May be repeated with permission of the instructor. *Prerequisites: Art Historical Methods (VIS 112) or two upper-division courses in art history and criticism or consent of instructor.*

118. Landscapes, Grottos, and Fountains (4)
Introduction to evolving concepts of nature as seen in the art of garden design. Religious, philosophical, and social importance of gardens in Western and non-Western cultures. Iconography of gardens. Public and private gardens. Development of public parks and botanical gardens in England and the U.S. *Prerequisite: none.*

119. Issues in the History of Architecture (4)
This course examines the impact of architecture on the development of Western civilization from ancient Greece through the twentieth century. Lecture topics include the development of a critical vocabulary for the analysis of buildings, the relationship between architectural form and function, and the changing role of the architect in society. *Prerequisite: none.*

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. *Prerequisites: none; Western Art I (VIS 11) 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; Western Art I (VIS 11) 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; Western Art I (VIS 11) or Roman Art (VIS 120B) recommended.*

121A. 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 of which all later societies are the inheritors. This figurative tradition–whose greatest monuments are the painted cave sanctuaries of France and Spain, such as the famed Lascaux and Altamira–still dazzles us with its unsurpassed vitality of artistic expression and mystifies us with the unanswered questions of its meaning. This course will offer an overview of the range and scope of Palaeolithic artistic production over its 20,000-year span, against the background of what is known about contemporary conditions of nature, society, and human life. It will present a critical review of the various modern interpretations of the function and meaning of Palaeolithic art, especially the theories of A. Leroi-Gourhan. It will conclude with a look at the perpetuation and transformation of Palaeolithic art and its world-view in the new Neolithic cultures–based on agriculture and settled town life–which arose in the Mediterranean and Near East at the close of the Ice Age, and which are the direct ancestors of our own urban and technological society. *Prerequisite: none; Western Art I (VIS 11) recommended.*

122A. Art of the Middle Ages (4)
Introduction to the art and architecture of Western Europe from the fourth to fourteenth century. Topics include the legacy of antiquity, the creation of sacred space, new concepts of human representation, and the upside-down world of monsters and grotesques. *Prerequisite: none; Western Art I (VIS 11) or Western Art II (VIS 12) recommended.*

122B. Renaissance Art (4)
In the fifteenth century, artistic developments in Italy and Northern Europe followed parallel and, at times, interpenetrating courses. Artists in both regions sought to renew the visual languages they had inherited from the Middle Ages by bringing them into closer conformity with the laws of vision and of nature. As a result, artists like Donatello and Mantegna in Italy and Jan van Eyck and Rogier van der Weyden in Flanders produced works which presented timeless religious truths in the guise of temporal occurrences. Sustained by the achievements of their predecessors and nourished by the remains of Roman antiquity, Leonardo da Vinci, Michelangelo, Raphael, and Titian created a style that expressed with extraordinary power and directness the meaning of their humanist religion. For the rest of the sixteenth century, artists such as D\uurer and Holbein, Veronese and El Greco mastered, used, and refined the visual language these earlier geniuses had created. *Prerequisite: none; Western Art II (VIS 12) recommended.*

122C. Baroque Art (4)
The baroque style was created in Rome around 1600 and quickly spread throughout Italy and to the other countries of Europe. A period of increasing intellectual specialization, of the entrenchment of modern national boundaries, of the coexistence of rival religious organizations, of the formation of artistic academies, and of the flourishing of a middle class which provided patronage for the arts, the baroque period afforded individual artists a wide range of stylistic and expressive possibilities. By focusing on the major works of Caravaggio, Bernini, Borromini, Rubens, Rembrandt, and Vermeer, this course stresses the different ways each artist used the visual language inherited from the Renaissance. *Prerequisite: none; Western Art II (VIS 12) recommended.*

123A. Italian Art of the Early Renaissance (4)
Spurred by a renewed interest in the natural world and in the classical past, a coterie of artists in contact with Brunelleschi and Donatello in Florence brought about a revival of the arts that spread throughout Italy. Freed from the medieval role of the artist as craftsman, Alberti, Piero della Francesca, Mantegna, Botticelli, and others produced works which embodied the highest values and intellectual achievements of the age. This course examines painting, sculpture, architecture, urban design, and art theory in a world of humanistic learning, of profound belief in God, and of faith in the inherent capacities of humanity, as an expression of the religious, philosophical, social, and political ideals of fifteenth-century Italy. *Prerequisite: none; Western Art II (VIS 12) or Renaissance Art (VIS 122B) recommended.*

123B. High Renaissance Art (4)
Ever since the sixteenth century, the names of Leonardo da Vinci, Bramante, Michelangelo, Raphael, and Titian have conjured up images of the highest artistic achievement. In this course, we will assess the qualities that made their art great by focusing on individual works such as the Last Supper and Mona Lisa, the Tempietto and Church of St. Peter, the David and the frescoes of the Sistine Chapel, The School of Athens and Transfiguration, the Venus of Urbino and Sacred and Profane Love. Particular emphasis will be given to the situations for which the works were produced, their religious and philosophical content, and their relation to contemporary art theory. *Prerequisite: none; Western Art II (VIS 12) or Renaissance Art (VIS 122B) recommended.*

123C. 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 mean-

ings. *Prerequisite: one upper-division course in Renaissance art; Art Historical Methods (VIS 112) or High Renaissance Art (VIS 123B) recommended.*

123D. The City in Italy (4)
Each of the great Italian cities has a style and heritage all its own. This course considers the social, political, economic, and religious aspects of civic life which gave rise to the unique characteristics of such cities as Florence, Siena, Venice, or Rome. Emphasis will be placed on the function and content of civic art, the architecture of public buildings, and the design of the urban environment. The specific content of the course, the city or cities and periods under consideration, will vary. *Prerequisite: none; Art Historical Methods (VIS 112) recommended.*

123F. Castles, Cathedrals, and Cities (4)
Exploration of Gothic art in Western Europe through three leading centers of creative activity: the castle, the cathedral, and the city. Architecture, stained glass, illuminated manuscripts, tapestries and sculpture, both sacred and secular, are considered. *Prerequisite: none; Western Art I (VIS 11) or Western Art II (VIS 12) recommended.*

***123G.* Art in the Age of Jan van Eyck (4)**
The new love of nature and intensified spirituality which characterize early northern Renaissance art are investigated through the work of late Gothic illuminators like Pucelle and the three fifteenth-century master painters Campin, van Eyck, and van der Weyden. *Prerequisite: none; Western Art I (VIS 11) or Western Art II (VIS 12) recommended.*

123H. Images of Women in Medieval and Renaissance Art (4)
Saints, witches, goddesses, and courtly ladies are surveyed in this course which explores how medieval and Renaissance attitudes towards women were expressed in the art of the period. The archetypal images of Eve and Mary are emphasized. *Prerequisite: none; Western Art I (VIS 11) or Western Art II (VIS 12) recommended.*

123I. The Illuminated Manuscript in the Middle Ages (4)
Traces the evolution of the illuminated manuscript, one of the most brilliant achievements in Western painting, from its origin in late antiquity to the disintegration of the manuscript tradition under the impact of the first printed books. *Prerequisite: none; Art Historical Methods (VIS 112) or two upper-division courses in art history and criticism recommended.*

123J. 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 like the Arnolfini Wedding are emphasized. *Prerequisite: none; Art Historical Methods (VIS 112) or two upper-division courses in art history and criticism recommended.*

123K. Albrecht Dürer and the First Media Revolution (4)
Examination of the graphic work of Albrecht D\uurer, the first master printmaker in Western art: his technical innovations, new subject matter, and relationship to the new audiences for art which large-scale production of visual images had created. *Prerequisite: none; Art Historical Methods (VIS 112) or two upper-division courses in art history and criticism recommended.*

123L. History of Print and Printed Images (4)
Traces the history of graphic arts from the fifteenth century to the present, focusing on the invention of printmaking and its revolutionary impact on art and society and the work of master printmakers like Dürer, Rembrandt, and Daumier. *Prerequisite: none; Western Art I (VIS 11) or Western Art II (VIS 12) recommended.*

123M. Baroque Architecture (4)
This course provides a general introduction to the urban issues raised by the development of the great cities of baroque Europe. Special emphasis will be placed on the development of Rome as the ideal baroque city. *Prerequisite: none; may be substituted as a requirement for baroque art.*

123N. Baroque Masters (4)
The career and influence of a great master of seventeenth-century art such as Caravaggio, Bernini, Rembrandt, and Velaszquez. Each student will prepare a class presentation and will submit a research paper. *Prerequisite: Western Art II (VIS 12) or one upper-division course in either Renaissance or baroque art.*

124A. The Art of the Eighteenth Century (4)
From Watteau to Goya, eighteenth-century artists turned to the past, especially to medieval Europe and to the antique and looked at the present for inspiration, imagery and style. Piranesi explored the antique ruins of Italy, Walpole studied the medieval architecture of England, and Hogarth the society of contemporary London, while in France, David delved into both antique and current historical events. Out of these studies came Piranesi's Views of Rome, Walpole's Gothic fantasy home of Strawberry Hill, Hogarth's Rake's Progress, and David's Oath of the Horatii and Marat Assassinated. In America, Jefferson and Stuart struggled with how to portray the new Republic in stone and paint. The American and French Revolutions and the rise of industrialization greatly affected European artists and art movements of the later eighteenth century. *Prerequisite: none; Western Art II (VIS 12) or Nineteenth- and Twentieth-Century Art (VIS 14) recommended.*

124B. The Art of the Nineteenth Century (4)
Napoleonic and post-Waterloo Europe witnessed the expansion and transformation of the previous century's neo-classical and romantic movements. These styles, closely intermeshed and chronologically overlapping, were challenged by the emergence of the realist movement in the 1840s. With the rise of the salons, museums, and galleries and of art criticism, the middle class took on a new interest in art. They joined with the upper classes to study, admire, mock and/or ignore the work of Gericault, Ingres, Delacroix, Courbet, Bonheur, and Manet in France; Constable, Turner and the Pre-Raphaelites in England; Friedrich in Germany; and Cole, Church, and Homer in America. By the end of the century, artists had to contend not only with photography as an alternative mode of visual representation, but also with the growing severance between the public and the avant-garde. Artists such as Degas, Monet, Cassatt, Seurat, Cezanne, Van Gogh, Gauguin, and Munch no longer had guaranteed access to exhibition space, critical approval, or public support. Brilliant and fascinating as was the art of the late nineteenth century, the price for making it, socially, psychologically and economically, was a high one for the artist. *Prerequisite: none; Western Art II (VIS 12) or Nineteenth- and Twentieth-Century Art (VIS 14) recommended.*

124C. The Art of the Twentieth Century (4)
In the first decade of the new century, Picasso's Demoiselles d'Avignon and Matisse's Joy of Life shook Paris, a city soon to be dominated by the cubist movement; while in the New York of Stieglitz and O'Keeffe, the Parisian Duchamp came to seek his artistic fortune. In Italy, de Chirico and the boisterous futurists challenged accepted artistic standards, as did Nolde, Kirchner, and Kollwitz in Germany. Visionary abstraction was explored by Kandinsky in Munich, Mondrian in Holland, Taeuber-Arp in Switzerland and France, and Malevich in Russia, where other artists also became involved in the visual expression and promotion of the 1917 Russian Revolution. New architectural styles and approaches were developed by Corbusier, Wright, and the German Bauhaus architects. In the 1920s, cubist Paris became a surrealist center–visited by Ernst, Miro, Magritte, and Dali, among others. Many avant-garde European artists took refuge in New York during World War II. The highly original New York School of the 1940s and 1950s, often called Abstract Expressionism, responded deeply to these European presences as well as to its own New World cultural heritage. *Prerequisite: none; Western Art II (VIS 12) or Nineteenth- and Twentieth-Century Art (VIS 14) recommended.*

125B. Modernist European Painting, 1876-1914 (4)
An intensive examination of the emergence and development of modernist tendencies in European painting, with particular attention to the work of late nineteenth-century artists such as: Monet, Manet, Renoir, Cezanne, Seurat, Van Gogh, Toulouse-Lautrec, Munch, Gauguin, Degas, and others, and, in the first decade of the twentieth century, the work of Picasso, Matisse, Duchamp, Kandinsky, and the schools of German Expressionists and the Italian Futurists. *Prerequisite: none; Western Art II (VIS 12) or Nineteenth- and Twentieth-Century Art (VIS 14) recommended.*

125C. Matisse and Picasso (4)
A study of two major artists of the early twentieth century: Matisse and Picasso. Matisse, the "conservative" modern, and Picasso, the "radical" modern. Particular emphasis will be placed on the sources and effects of their respective innovations within their contemporary context. *Prerequisite: Western Art II (VIS 12) or Nineteenth- and Twentieth-Century Art (VIS 14).*

125D. Contemporary Art (4)
After World War II, the relationship between America and Europe changed radically in the arena of both politics and art. American economic power supported the rise in prestige and fame of American art; witness the international success of the abstract expressionists Pollock and De Kooning. The course will examine the currents, complementary and contradictory, in American art since 1950; the ambiguous art of Johns, the chance inventions of Cage, the celebration, albeit often ironic, of popular culture and attitudes in Warhol, Marisol, and Oldenburg, the ambitions and restraints of minimalism, and the explosive, troubled art scene of the late 1960s. That time saw not only the emergence of art and technology, conceptual/process art, earthworks, and early performance/body art but also the artistic visions and painted, sculpted, and performed protests of the Third World and women's movements. The course will end with an examination of art of the 1970s–pattern and decoration, new image, etc.–and will finish with a look at the current reshifting of artistic power between Europe and America. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (VIS 14) recommended.*

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.*

125F. History of Twentieth-Century Sculpture (4)
Sculpture reemerged as a major art form in the twentieth century. Beginning with the playful experiments of Picasso, the Readymades of Duchamp and the primordial purism of Brancusi, the notion of sculpture has been subjected to a continuous set of transformations. By the early 1920s, many new possibilities opened up: the comical constructions of the dadaists, the dream constructions of the surrealists, the utopian fantasies of the Russians, and the functional aspirations of the Bauhaus designers. Political developments in

Eastern and Western Europe led to an ideological and fashion-driven resurgence of neo-representational sculpture in German and Italian fascist works and to applied art deco styles in America and France. At the end of the Second World War, the energies of sculpture were liberated once again to produce abstract expressionist and neo-dada sculpture: the work of David Smith, Jasper Johns, and Louise Nevelson. Styles and genres proliferated wildly in the late 1960s and early 1970s as sculptors drew upon a wide range of artistic and craft precedents. These new styles included minimal, site-specific and earthwork modes, and a variety of systems art bearing on technological, psychological, social, ecological, and political concerns. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (VIS 14) recommended.*

125G. American Folk Art (4)
This course will examine American folk arts which draw their strength from an amalgam of indigenous traditions and the personal vision of the artists. Limners, Shakers, the Santos of New Mexico, Afro-American folk artists, and quilt-makers will be discussed, as well as the role women play in the tradition of folk art. Independent research will be required. *Prerequisite: none; Art Historical Methods (VIS 112) recommended.*

126A. 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; Non-Western Art (VIS 13) recommended.*

126B. Polynesian Art (4)
The course will study the aristocratic art systems that once flourished in the Society, Marquesas, and Hawaiian Islands. The "mysteries" of Easter Island will be discussed along with the continuing tradition of the tapa-process in Tonga, and Samoa. Special attention will be given to the ongoing Maori arts from New Zealand, including the symbolic council houses and the significance of tattooing. *Prerequisite: none; Non-Western Art (VIS 13) recommended.*

126C. Melanesian Art (4)
This course will analyze the role of "Big Man"/artist in this splendidly rich and diverse region of the world. The relationship of art to ritual acts, myth, and dance will be explored in select areas of New Guinea (i.e., the Abelam, Arapesh, Iatmul people) and West Irian (the Asmat). The study of the art systems unique to New Ireland, the New Hebrides, the Solomons, and Australia will further our understanding of artistic practices and symbolic models. *Prerequisite: none; Non-Western Art (VIS 13) recommended.*

126D. Art of the Southwest American Indians (4)
The American Southwest is a culturally diverse area with a rich and varied artistic continuum. The Hopi, Navajo, Zuni, and Pueblo Indians all have their own ceremonies, art, and architecture. The course will explore the ancient pueblos of Chaco Canyon and Mesa Verde's "cliff houses," analyze the kachinas and shalako, and examine the famous weaving and pottery-making traditions of the present. *Prerequisite: none; Non-Western Art (VIS 13) recommended.*

127B. 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; Non-Western Art (VIS 13) recommended.*

127C. Female Artists and Female Imagery (4)
This course will analyze the equivocal role of women as artists in selected non-Western societies with a look at parallel phenomena in the West. It will also examine, within given cultural contexts, the significance of female imagery: what type of female images predominate (e.g., mother/child, splayed female, etc.) and who are the patrons and/or consumers of these images. *Prerequisite: one upper-division art history course; two recommended.*

127D. Primitivism and Exoticism in Modern Art (4)
At the turn of the century, the arts of Africa, Asia, and Oceania had a strong impact on modern art. European artists learned new formal and expressive devices. At the same time, their views of art and of themselves were shaped by a fervent–if misunderstood–image of exotic forms of life closer to nature. Gauguin, the cubists, the German expressionists, the surrealists, and later artists as well responded deeply to the stimulus of these exotic cultures and their arts. *Prerequisite: none; non-Western Art (VIS 13) recommended.*

128A-E. Topics in Art History and Criticism
These lecture courses treat styles, movements, themes, and theories of art which are touched on only briefly in general survey courses but are not treated in our regularly scheduled upper-division lecture courses. 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 catalog 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 more than once for credit, with consent of instructor and/or program adviser. *Prerequisite: none; courses in art history and criticism recommended*

128A. Topics in Art Criticism and Theory (4)
This course will treat topics such as: Art Theory in the Renaissance; Representation: The Realist Strategy; Views of Nature: Landscape Painting to Earthworks.

128B. Topics in Ancient Art (4)
This course will treat topics such as: High Classic Art, Hellenistic Art, Architecture of Ancient Rome and Its Empire.

128C. Topics in Medieval, Renaissance, and Baroque Art (4)
This course will treat topics such as: Romanesque Art, The Rise of the Gothic Style, Northern Renaissance Art, Baroque Architecture, Seventeenth-Century Painting in Spain and the Low Countries.

128D. Topics in Modern Art (4)
This course will treat topics such as Neoclassicism and Romanticism; Impressionism and Post-Impressionism; Cubism; Dada and Surrealism; Abstract Expressionism.

128E. Topics in Non-Western Art (4)
This course will explore such themes as the impact of Polynesian art and society on the works of Paul Gauguin; art forms (i.e., tattooing, architecture, masks) as visual manifestations of social relationships; the enigmatic use of punning in the visual arts.

129A-E. Special Problems in Art History and Criticism
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 (A, B, C, D, or E) following 129 in the course number designate the particular area of art history or criticism 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. *Prerequisite: Art Historical Methods (VIS 112) or two upper-division courses in art history and criticism.*

129A. Special Problems in Art Criticism and Theory (4)
Specialized aspects of the theory and criticism of art will be examined in a changing series of courses designed for intensive student participation. Topics currently foreseen will include: Object and Image: A Structural Enquiry; Sources and Development of Formalist Criticism: The Eighteenth Century to the Present; Symbolist Ideology and Practice in the Arts; Problems in the Theory of Modernism.

129B. Special Problems in Ancient Art (4)
This course will investigate particular themes or areas of ancient art in greater depth than is possible in period surveys. Topics currently foreseen include: The Portrait in Antiquity: Aspects of Self and Society; Art and Ideology in Augustan Rome; Roman Historical Relief.

129C. Special Problems in Medieval, Renaissance, and Baroque Art (4)
This course will treat a particular artist or problem of interpretation in medieval, Renaissance, and baroque art. Issues of the style, function, meaning, sources, impact, practice, and theory of art are investigated by focusing on a given artist, group of artists, work or works, subject, or historical and critical approach. The topics currently foreseen include: Alberti, Mantegna, and Leonardo: The Theory and Practice of Renaissance Art; The Art of Andrea Mantegna; Nudity and Sexuality in Christian Art; The Classical Tradition and Its Transformations.

129D. Special Problems in Modern Art (4)
This course will study specialized historical periods and problems, and individual artists in the eighteenth, nineteenth, and twentieth centuries up to the present. The topics under consideration include: The Art of the Empires: Vienna and London in the Late Nineteenth Century; Art, Culture, and Politics in the Weimar Republic; The Crisis of the Later 1960s: New Movements and Re-directions in Art and Criticism; Marcel Duchamp; Twentieth-Century Environmental Painting; Twentieth-Century Women Artists.

129E. Special Problems in Non-Western Art (4)
This course allows students to pursue issues of meaning, interpretation, and methodology in relationship to specific non-Western societies. Topics under consideration include: Day of the Dead in Tijuana; Popular and Tourist Art in Tonga; Santos Tradition of Folk Art in New Mexico.

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.*

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. *Prerequisite: consent of instructor.*

141. Introduction to Programming for Graphics (4)
Introduction to the various graphic devices of both vector and raster types and to the software associated with them. This course is not concerned specifically with mathematical two-dimensional projections of three-dimensional objects; rather with the design of programs controlling the generation of graphic events as a medium for the artist. The second part of the quarter will be devoted to major projects specified by students, and to class discussion of issues arising in the design of those projects. *Prerequisites: VIS 41 and 42.*

150. History and Art of the Silent Cinema (4)
An investigation of silent films from early cinema (so called "primitive cinema") to the development of a classical style of filmmaking in the late teens and twenties. The course will ex-

plore issues of spectatorship, analyze differences between American and European cinema, and link thematic and economic histories with cultural studies, with an emphasis on the interaction between film and other visual arts of the period in Europe, Russia, and the United States. Materials fee required. *Prerequisite: VIS 84 or consent of instructor.*

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.*

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 14, 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.*

164. Photographic Strategies (4)
An introduction to the aesthetic problems in photography. Portfolio required for admission. Materials fee required. *Prerequisites: VIS 60 and consent of instructor.*

165. Camera Techniques (4)
An intermediate course involving refined control over different films, developers, papers, and other photographic techniques. Portfolio required for admission. Materials fee required. *Prerequisites: VIS 60 and consent of instructor.*

166. Advanced Camera Techniques (4)
An 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. *Prerequisites: VIS 60, 165, 167, and consent of instructor.*

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 60, 70, 71, 111, and 174.*

174. Media Sketchbook (4)
A first experience in formulating ideas and images for creative media production. As the traditional artist uses his or her sketchbook to draw rapid, bold concretizations of ideas, this class encourages speed, clarity, originality, and taking chances. *Prerequisite: VIS 1 or 2 or 3, 14, 60, 70, 71, 84.*

176. Introduction to Filmmaking (4)
Designed as an introduction to filmmaking, this course provides a technical foundation as well as a creative and theoretical context to 16mm film production. The student learns the use of motion picture camera (Bell & Howell, Bolex and Arriflex S), use of lightmeter, frame composition, sound recording, picture and sound editing. The course exposes the extent of the filmmaking process from shooting, lighting, to editing and mixing. Student to produce a short film (one to two minutes) with a post synchronized sound track. *Prerequisites: VIS 1 or 2 or 3, 14, 60, 70, 71, 84, 174; VIS 177 recommended.*

177. Scripting and Editing Strategies (4)
The aim of this course is to examine the conceptual rather than technical structures of scripting and editing. The emphasis for script writing will be on the reading and analysis of both traditional and more experimental works. Students will be expected to write several short scripts. Editing will be approached as a structural partner to scripting, studying the strategies and grammars that shape a film or videotape. Based on works available for study, students will produce analytical papers. *Prerequisites: VIS 70, 71, 111, and 174.*

180. Documentary Media (4)
This is a production course investigating the concept of documentary. Studying examples from the documentary traditions of film, video, and photography, this course will develop a critical discourse centering around the representation of "truth," the concept of point of view, the objective/subjective paradox, the dynamic forces of context, and the overlap with the narrative and experimental traditions. May be repeated twice for credit. *Prerequisites: two required from VIS 164, 165, 172, 176, 177; VIS 177 strongly recommended.*

181. Sound and Lighting (4)
An advanced course aimed at gaining a sophisticated control of lighting and sound-recording techniques with the understanding of their theoretical implications and the interrelation between production values and subject matter. The interrelation between sound and image in various works (film, video, or installations) will also be discussed. Lighting principles like modelling, matching lights, and continuity lighting will be demonstrated in class. Sound characteristics like perspective, distance, and presence will be presented with rerecording and the construction of a mix sound track. *Prerequisites: VIS 174 and three of the following courses, depending on emphasis: VIS 164, 165, 172, 176, 177.*

182. Advanced Editing (4)
Covering both film and video editing, this course is designed to study the problems of editing from both a theoretical and practical point of view. Films and tapes will be analyzed on a frame-by-frame, shot-by-shot basis. Course may be repeated twice for credit. *Prerequisite: VIS 177 and either 172, 173, or 186.*

183. Narrative Media (4)
A production course exploring the traditional and expanded modes of narrative in film, video, or photography. Attention will be paid to the relations between "story" and narrative, to the difference between recording, reporting, and representing events and the creation for the viewer of the subjective experience of the unfolding of events. All students will be expected to complete several short narrative works, all of which will be critiqued in class. May be repeated twice for credit. *Prerequisites: two required from VIS 164, 165, 172, 176, 177; VIS 177 strongly recommended.*

186. Advanced Filmmaking Strategies (4)
Designed as the second part of a two-part sequence, this course presents the techniques of sync sound recording and shooting, crew work, planning preproduction and production, and links technical decisions with creative and theoretical understanding of film production. The student will prepare, produce and edit a short 16mm film (three to five minutes). It is recommended that the student have, at the beginning of the quarter, a fully developed script for the final project. *Prerequisites: VIS 176, 177, and consent of instructor.*

187. Animation (4)
A labor-intensive, moderately technical 16mm production course using departmental facilities. Assignments designed to explore different techniques such as cell and drawn animation, clay and object animation, clay and object animation, cut-outs, rotoscope imagery and other special effects. Large amount of time required. Ability in drawing not necessary. May be repeated once for credit. *Prerequisites: VIS 186 and consent of instructor.*

190. Polynesian Music and Dance (2/4)
The performing arts . . . traditional dance and music from small-scale societies. This course will examine in an experiential manner the performative mode of ceremonial dance and music from the islands of Polynesia to West African cultures. *Prerequisite: none; concurrent corequisite: VIS 13.*

195. Teaching in Visual Arts (4)
Each student will meet with a section once a week under the direction of the instructor. 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. *Prerequisite: consent of instructor.*

NOTE: Open only to highly advanced upper-division students. Requires both instructor's and department chair's approval. Pass/Not Pass grades only.

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.

GRADUATE

204. Performance (4)
The class considers the performance aspect of much contemporary art. All graduate students, including those without a performance background, are welcome. Students will consider their own work within a process-oriented or performance context. The course will feature collaborative and critical participation, which is intended to offset the often isolated conditions under which most graduate students work. Talks given by visitors will offer an insider's view to the conditions, problems, and aspirations of practicing performance artists. Each student is responsible for a large project to be presented by the end of the term. May be repeated for credit.

205. Graduate Studies in Drawing (4)
A studio course in drawing focusing on individual projects. May be repeated for credit.

206. Graduate Studies in Painting (4)
A studio course in painting focusing on individual projects. May be repeated for credit.

207. Graduate Studies in Sculpture (4)
A studio course in sculpture focusing on individual projects. May be repeated for credit.

208. History of Performance (4)
This course will survey the origins and development of recent performance in the visual arts. Such movements as Gutai (Japan), Yves Klein's anthropometries, happenings, events, Fluxus (Europe and U.S.A.), earthworks, bodyworks, postal art, conceptualism and feminist performance comprise the broad range of activity in the last twenty-five years. The class will examine the theoretical bases and critical issues of performance as these may relate to the larger field of the arts today.

214. Intentionality (4)
This course is concerned with an inquiry into the possibility and conditions of interpretation of works of visual art. How are the wider contexts of the work, the intentions—conscious or otherwise—of its author, the immediate psychic and material circumstances of its creation, its envisioned function, and the persona who is the fictional counterpart of the real-life viewer, encoded into its structure? Previous theoretical approaches to these issues will be examined, alternative analytical models suggested, and these tested in a detailed analysis of specific works of art.

216. The Object (4)
An inquiry into the world of artifacts (some of them "works of art") by which human beings are surrounded, and the ways in which they function as agents of communication and modifiers of consciousness. Contemporary perspectives drawn from the fields of anthropology, sociology, contemporary art, and semiotics will be utilized alongside those derived from art theory, especially the structural-analytic tradition.

218. Marcel Duchamp (4)
A critical examination of the work of the most radical of the twentieth-century artists. In Duchamp's four-dimensional perspective, the ideas of art-object, artist, and art itself are deconstructed. The Large Glass and Étant Doné es... are the twin foci of an oeuvre without boundaries to which the invention of most of twentieth-century's avant-garde devices (chance techniques, conceptual art, etc.) are only incidental.

222. Communities and Art (The Shakers, William Morris & Co., and Bauhaus) (4)
A critical review of three communities which aimed to change the social and spiritual quality of life by aesthetic means. *Prerequisite: graduate status or consent of instructor.*

230. Graduate Studies in Art Criticism: Theory (4)
Seminars for advanced students in art criticism and art history in relation to the problems set by the real phenomenon of art production. Specifically advanced, individual projects will be required of graduate students. May be repeated for credit.

232. Tactics and Strategies (4)
A workshop-laboratory class involving a game-theory approach to the making of art in which attempts will be made to define a domain of interaction between a variety of possible players, the simplest of which is a two-person game involving art-audience.

236. Graduate Studies in Art Criticism: Practice (4)
This course is largely for people who intend to write criticism. It will attempt to explore various approaches to criticism, largely through the writings of contemporary art criticism, though literary and film criticism will also be considered. Each student will be expected to write and deliver several short critical papers on subjects within his or her competence. May be repeated for credit.

237. Graduate Studies in Art (4)
This course provides the opportunity for in-depth graduate study in the practical, critical, ideological, or theoretical contexts and contents of art making. Courses under this heading may reflect current interests of the instructor or treat a controversial issue in the art world. In recent years, the course has been devoted to topics such as film history in Russia after the Revolution, exploration in subject matter and form, scripting (film, video), portraiture, art as editing, art and technologies. May be repeated for credit.

244. Charting and Subject Matter (4)
This is a narrative-based course which uses various forms of storytelling. It focuses on a methodology for establishing autobiographical material, ordering it and presenting it in various media.

278. Graduate Video Seminar (4)
The seminar will examine video as an art form, with particular emphasis on recent works of independent video artists. The specific expressive nature of the video image, questions of form and meaning, and the evolving relationship of video art to the other arts will be studied in depth.

279. Graduate Video Workshop (4)
The course explores creative aspects of the video medium through various formats, styles and approaches in independent production, integrating elements into artistic form. Concept, development from script, shooting, editing, sound, etc., will be stressed. May be repeated for credit. *Prerequisite: consent of instructor.*

288. Advanced Studies in Film (4)
A film course dealing with all aspects of film criticism and film writing, stressing individual problems. May be repeated for credit.

289. Graduate Film Seminar (4)
Designed to deal with a wide variety of practical aspects of the film, including direction, script writing, criticism, and photography. *Prerequisite: consent of instructor.*

290A. Graduate Seminar (4)
Contemporary World Views
As products of a human mind, all works of art are conceived within the value system of their maker. Whether or not the artist is conscious of it, the world of art reflects a world view. Once produced, it becomes susceptible to interpretations which attach to it or find in it human values. Some of these values are ideological, such as "socialist realism," others are more a matter of artistic outlook or belief, such as "expressivist," "idealist," "mimetic," and "realistic." This course will locate the world views implicit within contemporary works of art, including, when appropriate, those of the faculty and graduates. Required of first-year students.

290B. Graduate Seminar (4)
Critical Approaches to Art Making: Context, Subtext, and Pretext
This course is designed to encourage the development of a self-critical approach to art making. Key intellectual issues of contemporary art will be explored through the discussion of writings by artists and critics. Topics to be discussed include the concept of artistic tradition; art and politics and the politics of art and criticism; women's art and feminism; modernism and post-modernism as period concepts; representation, re-presentation and the textuality of art; the function and significance of quotation and appropriation in art; and media specific approaches to art.

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. These units can only be taken after completing the First Year Review, and are intended to be with the chair of the student's review committee.

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 (three units) within the department to fulfill degree requirement.

Warren College

OFFICE: Literature Building, Second Floor, Warren College

The Writing Program

OFFICE: Building 410, University Center

Warren College 10A and 10B are required of every Warren College student. This general-education sequence must be taken immediately following the fulfillment of the Subject A requirement. The purpose of the sequence is to teach and thereby enable students, through intensive practice, to read and write critically in

a variety of contexts. Classes are seminar-size and center on discussion of student work.

The two-quarter sequence emphasizes argumentative and critical writing 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 readings prepare students for their studies in the Ethics and Society course as well as 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. Warren College 10A and 10B are offered P/NP only, and students cannot test out of this general-education requirement.

10A-10B. The Writing Course (4-4)
A workshop course in reading and writing required of all Warren College students. The course emphasizes argumentation and critical writing based on sources. *Prerequisite: satisfaction of the university Subject A requirement.*

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 scores of 710 verbal and 650 in mathematics, or are National Merit Scholars or Regents Fellows, 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. Entering transfer students with a GPA of 3.8 based on at least thirty-six quarter-units of college work are also eligible.

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.

Warren Scholars Seminar

OFFICE: 3238 Literature Building, Second Floor, Warren College

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 and 11B, Warren Scholars Seminar, which fulfill the college writing requirement. Warren 11A is taught by a variety of distinguished faculty and teaching assistants. Warren 11B is taught by a faculty member from a social science or humanities department.

Entering freshman Honors Program students are admitted to the Warren Scholars Seminar by invitation, and must have a SAT II writing score of 720 or above.

Students who have taken the Scholars Seminar may participate in teaching assistant apprenticeships (Warren 195, Apprentice Teaching) in Warren 11A. Teaching assistants participate in planning and developing the fall quarter seminar. They interview the faculty speakers, are trained to lead group discussions, read and evaluate student papers, and plan social events for the class.

Additional information and an application may be obtained by writing to: Warren Scholars Seminar Coordinator, Warren College, UCSD, La Jolla CA 92093-0422.

11A-11B. Warren Scholars Seminar (4-4)
The Warren College Scholars Seminar allows students to develop and refine their expressive and analytical skills by participation in a two-quarter sequence. The emphasis is on the interdisciplinary approach to a group of topics linked to the relation of individuals and society, and the function of evidence and observation in the formation of theories.

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 have taken the Warren Scholars Seminar.*

Ethics and Society

OFFICE: Academic Advising, 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-10B (or Scholars Seminar 11A-11B), 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, Literature Building, Second Floor, Warren College

Health Care–Social Issues is an interdisciplinary minor administered by Warren College but 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, Literature Building, Second Floor, Warren College

Law and Society is an interdisciplinary minor administered by Warren College, but 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, but 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; (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.

Women's Studies

OFFICE: 2024 Humanities & Social Sciences Building, Muir College, (619) 534-3589

Affiliated Faculty

Professors

Rae Blumberg, Ph.D., *Sociology*
Michael Davidson, Ph.D., *Literature*
Abraham Dijkstra, Ph.D., *Literature*
Page duBois, Ph.D., *Literature*
DeeDee Halleck, Ph.D., *Communication*
Harry Hirsch, Ph.D., *Political Science*
Jorge Huerta, Ph.D., *Theatre*
Judith Hughes, Ph.D. *History*
Helene Keyssar, Ph.D., *Communication*
Susan Kirkpatrick, Ph.D., *Literature*
Babette Mangolte, Ph.D., *Visual Arts*
Masao Miyoshi, Ph.D., *Literature*
Louis Montrose, Ph.D., *Literature*
Chandra Mukerji, Ph.D., *Sociology/ Communication*
Jann Pasler, Ph.D., *Music*
Carol Plantamura, M.F.A., *Music*
Rosaura Sanchez, Ph.D., *Literature*
Ellen Seiter, Ph.D., *Communication*
Shirley Strum, Ph.D., *Anthropology*

Associate Professors

Ann Craig, Ph.D., *Political Science*
Susan G. Davis, Ph.D., *Communication*
Yen Espiritu, Ph.D., *Ethnic Studies*
Christine Hunefeldt, Ph.D., *History*
Stephanie Jed, Ph.D., *Literature*
Rebecca Klatch, Ph.D., *Sociology*
Rachel Klein, Ph.D., *History*
Dorothy Ko, Ph.D., *History*
Todd Kontje, Ph.D., *Literature*
Martha Lampland, Ph.D., *Sociology*
Lisa Lowe, Ph.D., *Literature*
Stephanie McCurry, Ph.D., *History*
Michael Meranze, Ph.D., *History*
Carol Padden, Ph.D., *Communication*
Fitz John Porter Poole, Ph.D., *Anthropology*
Roddey Reid, Ph.D., *Literature*
Vicente Rafael, Ph.D., *Communication*
Marta Sanchez, Ph.D., *Literature*
Kathryn Shevelow, Ph.D., *Literature*
Susan Smith, Ph.D., *Visual Arts*
Cynthia Truant, Ph.D., *History*
Cynthia Walk, Ph.D., *Literature*
Winifred Woodhull, Ph.D., *Literature*

Assistant Professors

Suzanne Brenner, Ph.D., *Anthropology*
Lisa Catanzarite, Ph.D., *Sociology*
Maria Charles, Ph.D., *Sociology*
Steven Epstein, Ph.D., *Sociology*
Rosemary George, Ph.D., *Literature*
Judith Halberstam, Ph.D., *Literature*
Valerie Hartouni, Ph.D., *Communication*
Susan Larsen, Ph.D., *Literature*
Pamela Radcliff, Ph.D., *History*
Shelley Streeby, Ph.D., *Literature*
Paule Cruz-Takash, Ph.D., *Ethnic Studies*
Nicole Tonkovich, Ph.D., *Literature*
Lisa Yoneyama, Ph.D., *Literature*
Omelbanine Zhiri, Ph.D., *Literature*

Adjunct Associate Professor

Mary Walshok, Ph.D., *Sociology*

Women's Studies

The field of women's studies has exploded over the past twenty years. It has developed a theoretical base, body of knowledge, and perspective which cannot be attained within the confines of the traditional disciplines. In its analysis of the powerful and problematic construction of gender, ethnic, class and sexual diversity, the field of women's studies revises and enlivens our understanding of the world with new conceptual paradigms.

The UCSD Women's Studies Program is an interdisciplinary academic program spanning departments and disciplines and offering students the opportunity to study constructions of gender, race, class, and sexual and national identities. The intersection of these categories of experience as well as the history of debate over what these categories mean is an important component of the Women's Studies Program curriculum. Students learn to apply the methods and theories of social scientists, historians, and literary scholars to the study of gender. They explore the relationship of theory and scholarship to activism. They develop critical reasoning and analytic skills, research and communication skills, conceptual tools for social change, and the abilities to interpret complexities of power, asymmetries in gender relations across history, class, and cultures.

Women's studies prepares undergraduates for a variety of careers. The major in women's studies, for example, provides an excellent foundation for 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 women's studies equips them with theoretical and methodological strengths in most disciplines and applied research fields. Specialists in women's 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 other institutional structures designed specifically to study and assist women.

The Women's Studies Program offers two options of study: an undergraduate major and minor (or program of concentration). To declare a major, a department stamp is required. Because women's 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 women's studies majors and minors are required to take the Introduction to Women's Studies sequence: Women's Studies 2A-2B-2C.

Major Program

Concentration in History

Group A. **Seven upper-division women's studies courses (twenty-eight units) in history,** from the Women's Studies approved course list.*

Group B. **Five upper-division women's studies courses (twenty units) in departments other than history** to be selected from the women's studies approved and petitionable course list.* At least one of these courses must be chosen from Women's Studies 102-103-104. All five courses may be chosen from Women's 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 department.

Concentration in Literature

Group A. **Seven upper-division women's studies courses (twenty-eight units) in literature,** from the Women's Studies approved course list.*

Group B. **Five upper-division women's studies courses (twenty units) in departments other than literature** to be selected from the Women's Studies approved and petitionable course list.* At least one of these courses must be chosen from Women's Studies 102-103-104. All five courses may be chosen from Women's 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 department.

Concentration in Social Science

Group A. **Seven upper-division women's studies courses (twenty-eight units) in communication and sociology,** from the Women's Studies approved course list.*

Group B. **Five upper-division women's studies courses (twenty units) in departments other than communication and sociology** (including the Departments of Anthropology, Ethnic Studies, History, Literature, Political Science, Urban Studies, or Visual Arts) to be selected from the Women's Studies approved and petitionable course list.* At least one of these courses must be chosen from Women's Studies 102-103-104. All five courses may be chosen from Women's 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 department.

*Upper-division courses not presently on the Women's Studies approved course list may be petitioned for major credit, if the principal focus of the course is on women or gender.

Honors Program

The Women's Studies Honors Program allows advanced Women's 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 Women's Studies director and steering committee. Normally, students eligible for honors will have a 3.5 grade average in 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 Women's Studies Steering Committee.

In the fall quarter of their senior year, students take the Honors Seminar (WS 190), taught by a member of the Women's Studies faculty. The first half of the quarter is devoted to intensive analysis and discussion of recent publications in the field of women's studies. 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 WS 196A: The Honors Thesis, 4 units of independent study with a faculty member on the Women's Studies Panel of Honors Advisers (made up of at least one member from each of the following areas: communication, sociology/anthropology, history, literature). 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, WS 196B.

In the spring quarter, each student who has successfully completed a thesis presents it in the WS 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 WS 90 have the words "with distinction" added to the notation of the major on their diplomas and transcripts.

Senior Thesis Option

Women's studies offers a special program for those majors who wish to conduct in-depth research in an area of women's studies over the course of two quarters. Students who choose this option first find a faculty supervisor and then enroll in two consecutive Women's Studies 199 courses (these courses may substitute for two of the twelve upper-division courses, one in Group A and one in Group B).

Thesis writers will work closely and on a regular basis with their faculty supervisors. During the first quarter, a preliminary proposal for the thesis, including a working outline and bibliography, is submitted. The bulk of the writing and revision will be done during the second quarter. This rigorous experience of writing and receiving frequent feedback from a faculty supervisor enhances the student's intellectual growth.

Double Major in Women's Studies and Another Department or Program

Students who wish to major both in women's studies and in another department or program must fulfill all requirements for the women's studies major as described above. Students must submit a double major petition for approval by the participating departments and the student's provost. Women's studies will accept up to two upper-division courses which overlap requirements for the two majors.

Minor Program (and Program of Concentration)

Women's studies minors are required to complete the "Introduction to Women's Studies" (Women's Studies 2A-2B-2C) and three upper-division courses (twelve units) applicable to the women's studies major and minor. Of the three upper-division courses, no more than two may come from the same department. Students

who petition the women's studies minor (or program of concentration) with junior or senior standing may, if they wish, petition to substitute three comparable upper-division women's studies courses for this introductory sequence. In this case, no more than three courses may come from the same department. Women's 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 women's studies advisers.

Special Studies, Internships, and Grade Options

Many women's 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 women's 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 women's studies advisers.

COURSES

Approved for the Women's Studies Major and Minor

LOWER DIVISION

WS 2A. Introduction to Women's Studies: Feminist Theories and Methods (4)
Survey of feminist critiques. Examines critiques from distinct historical and cultural conditions. Analyzes intersections of gender, class, race, ethnicity, sexuality, colonialism. Texts include case studies, ethnographies, literary, historical narratives and documents.

WS 2B. Introduction to Women's Studies: Contests and Controversies in Feminist Analysis (4)
Analyzes topics (varying yearly) relevant to current feminist debate, including pornography, abortion, occupational segregation, feminization of poverty, violence against women, and women in health, media, and social movements. Attention given to construction of gender identity within individual academic disciplines.

WS 2C. Introduction to Women's Studies: Global Perspectives of Women (4)
Focuses on sociocultural and/or geographic locations of women's experience. Considers gender in different economic, political, social systems. Topics may include comparative international feminisms, women and revolution, gender and colonialism. Texts include public policy documents, testimonials, essays, etc.

WS 90. Current Research in Women's Studies (1)
This seminar will introduce students to current interdisciplinary research topics and methods in the study of gender and sexuality. Faculty members at UCSD, as well as distinguished outside visitors, will be invited to present their work.

UPPER DIVISION

WS 102. Selected Topics in Women's Studies (4)
An interdisciplinary course focusing on one of a variety of topics in women's studies, such as gender and science, the body, reproductive technologies, women and public policy. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

WS 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 repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

WS 104. Cross-Cultural Perspectives (4)
An interdisciplinary course focusing on the relationship between gender and culture from a multiplicity of cultural perspectives. Possible topics include women in Latin America, gender and ethnicity, Asian-American women. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

WS 190. Honors Seminar (4)
Interdisciplinary readings in feminist theory and research methodology to prepare students for writing an honors thesis. Open to women's studies majors who have been admitted to Women's Studies Honors Program. May be applied toward primary concentration in women's studies major. *Prerequisites: admission to Women's Studies Honors Program and department stamp required.*

WS 196A. Women's Studies Honors Research (4)
A program of independent study providing candidates for women's 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 Women's Studies 196B. *Prerequisites: consent of instructor and department stamp required.*

WS 196B. Honors Thesis (4)
Honors thesis research and writing for students who have completed Women's Studies 190 and 196A. A letter grade for both Women's Studies 196A and 196B will be given at the completion of this quarter. *Prerequisites: consent of instructor and department stamp required.*

WS 198. Directed Group Study (4)
Directed group study on a topic not generally included in the women's studies curriculum. *Prerequisites: consent of instructor and director of Women's Studies Program and department stamp required.*

WS 199. Independent Study (4)
Tutorial; independent study on a topic not generally included in the women's studies curriculum. *Prerequisites: consent of instructor and director of Women's Studies Program and department stamp required.*

WS 500. Apprentice Teaching in Women's Studies (4)
Consideration of pedagogical methods appropriate to undergraduate teaching in women's 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 Departmental Courses

Please refer to appropriate departmental listings for courses noted below.

ANGN 115. Marriage and Family Life in Cultural Perspective

ANGN 171. Culture and Identity

ANRG 117. Gender across Cultures

Com/Cul 106. Feminist Video Workshop

Com/Cul 108. Images of Women

Com/Cul 115. The Theatre of Private Life: Family and Friends

Com/Cul 116. Feminist Theatre Workshop

Com/Cul 126. Gender and Film

Com/Cul 137. Politics of Bodies

Com/Cul 138. Feminist Theory

Com/Cul 139. Reproductive Discourse and Gender

ETHN 134. The Chicana

ETHN 183. Gender, Race, Ethnicity, and Class

HIEA 137. Women and Family in Chinese History

HIEA 162. The History of Women in China

HIEU 147. The History of Women in Europe: Middle Ages to the Early Modern Era

HIEU 148. The History of Women in Europe: From the Early Enlightenment to the Victorian Era

HIEU 149. History of Women in Europe: 1870 to the Present

HIEU 180. Topics in European Women's History: Gender and Politics from the Old Regime to the French Revolution

HILA 117. Indians, Blacks, and Whites: Family Relations in Latin America

HILA 161/261. History of Women in Latin America

HISC 103. Gender and Science in Historical Perspective

HITO 164/264. 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 172/272. Feminist Traditions in America

HIUS 173/273. Topics in American Women's History

HIUS 177/277. Gender and Sovereignty in the Age of Revolution

LT/CS 130. Gender, Race/Ethnicity, Class, and Culture

LT/EN 120E. Women in the Eighteenth Century

LT/EN 146. Women and English/American Literature

LT/EN 150. Gender, Text, and Culture

LT/EN 185. Themes in Afro-American Literature

LT/GN 101. Women in Antiquity

LT/GN 123. Women in Italy

LT/GN 187. Women and Literature

LT/GN 189. Gender Studies

LT/IT 140. Women in Italy

LT/TH 101. Issues in Feminist Theory

MU 115. Women in Music

Poli Sci. 107A. Gay and Lesbian Politics

Poli Sci. 115A. Gender and Politics

Poli Sci. 116A. Feminist Theory

Poli Sci. 116B. Advanced Feminist Theory

Poli Sci. 134P. Organizing Women in Latin America

Poli Sci. 166F. The American Welfare State

Soc/A 103F. Feminist Criticism and Social Theory

Soc/B 118. Sociology of Sex and Gender Roles

Soc/B 119. Sociology of Sexuality and Sexual Identities

Soc/C 129. The Family

Soc/C 132. Gender and Work

Soc/C 175G. Race/Ethnicity, Gender and Labor Markets

Soc/D 120W. Gender and Development

Soc/D 133. Comparative Sex Stratification

VA 123H. Images of Women in Medieval and Renaissance Art

VA 127C. Female Artists and Female Imagery

Petitionable Departmental Courses for the Women's Studies Major and Minor

The following courses may be petitioned to satisfy major and minor requirements when the principal focus of the course is on women or gender.

ANBI 110. Perspectives on Human Evolution

ANBI 175. Modeling the Behavior of our Early Ancestors

ANGN 168. Nature and Nurture: Race, Gender and Culture

ANGN 180. The Culture of Children

ANGN 194. Gender Trends

ANRG 102. Latin American Societies and Cultures

ANRG 145. Topics in Latin American Societies and Cultures

ANRG 162. Peoples of the Middle East

Com/Cul 100. Introduction to Communication and Culture

Com/Cul 105. Media Stereotypes

Com/Cul 126. How to Read a Film

Com/Cul 175. Advanced Topics in Communication: Culture

Com/Cul 179. Colonialism and Culture

Com/HIP 116. Practicum

Com/SF 101B. Television Documentary

Com/SF 175. Advanced Topics in Communication: Social Forces

ETHN 100. Theories and Methods in Ethnic Studies

ETHN 189. Special Topics in Ethnic Studies

HIEU 130. Europe in the Eighteenth Century

HIEU 131. The French Revolution: 1789-1814

HIEU 161. Topics in Roman History

HISC 166. Topics in the History of Social Sciences

HITO 112. The History of Psychoanalysis

HIUS 107. The Early Republic

HIUS 180. Immigration and Ethnicity in American Society

LT/CS 110. Popular Culture

LT/CS 140. Subaltern Studies in Context

LT/CS 150. Topics in Cultural Studies

LT/EN 110. The Renaissance: Themes and Issues

LT/EN 120A. The Eighteenth Century: Themes and Issues

LT/EN 125C. Second Generation Romantic Poets

LT/EN 127A. Victorian Period

LT/EN 127G. The 90s: Decade of Decadence

LT/EN 130A. Modern British Literature: Themes and Issues

LT/EN 143. The English Novel in the Eighteenth Century

LT/EN 145. English Novel in the Twentieth Century

LT/EN 147. Metamorphoses of the Symbol

LT/EN 148. Genres in English and American Literature

LT/EN 149. Themes in English and American Literature

LT/EN 153. The Revolutionary War and the Early National Period in U.S. Literature

LT/EN 154. The American Renaissance

LT/EN 155. Interactions Between American Literature and the Visual Arts

LT/EN 156. American Literature from the Civil War to WWI

LT/EN 175/B. New American Peotry: Post World War II to the Present

LT/EN 176. Major American Writers

LT/EN 178. Comparative Ethnic Literature: Discourse on Gender, Class, Race, Ethnicity

LT/EN 181. Asian-American Literature

LT/EN 183. Afro-American Prose

LT/EN 190. Seminars

LT/FR 121. The Middle Ages and the Renaissance

LT/FR 124. Nineteenth Century

LT/FR 125. Twentieth Century

LT/FR 141. French Literature

LT/FR 143. Major French Author: Maryse Conde

LT/GM 123. Eighteenth Century German Literature

LT/GM 190. Seminars

LT/GM 126. Twentieth Century German Literature

LT/GM 130. German Literary Prose

LT/GN 100. The Classical Tradition

LT/GN 113. Genres in Russian Literature in Translation

LT/GN 130. Novel and History in the Third World

LT/GN 143. Later Japanese Literature in Translation

LT/GN 145. Special Topics – Japanese Literature

LT/GN 160. Specialized Genres in LIterature

LT/GN 179. Contemporary Science Fiction

LT/GN 180H. Visual Arts, Film Studies and Literature Studies in Film History

LT/GN 185. Literature and Ideas

LT/GN 190. Seminars

LT/GN 191. Honors Seminar

LT/RU 128. Single Author, Soviet Literature

LT/SP 122. Romantic Movement

LT/SP 129. Twentieth Century Prose

LT/SP 152. Chicano Prose

LT/SP 171. Studies in Literature and Society

LT/WR 120. Personal Narrative

LT/WR 142. Forms of Written Discourse

Phil 152. Philosophy and Literature

Soc/B 114. Social Psychology of Close Personal Relationships

Soc/B 120S. Special Topics in Social Psychology and Social Interaction

Soc/B 178. Special Topics in the Sociology of Culture

Soc/C 126. Social Organization of Education

Soc/C 135. Medical Sociology

Soc/C 148. Political Sociology

Soc/C 152. Social Inequality and Public Policy

Soc/D 189. Special Topics

THHS 101. Topics

USP 143. U.S. Health Care

USP 145. Aging: Social and Health Policy Issues

USP 147. Case Studies in Health Care Programs

VIS ART 128A. Topics in Art Criticism and Theory

VIS ART 129E. Special Problems in Non-Western Art

VIS ART 150. History and Art of Silent Cinema

Appendix

[redacted] Statement

The University of California, in compliance with Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the 1973 Rehabilitation Act, the Employment Act of 1967, the Age Discrimination Act of 1975, and the Americans With Disabilities Act of 1990, does not discriminate on the basis of race, color, national origin, religion, sex, disability, or age in any of its policies, procedures, or practices; nor does the university, in compliance with Section 402 of the Vietnam Era Veterans Readjustment Act of 1974, and Section 12940 of the State of California Government Code, discriminate against any employees or applicants for employment because they are disabled veterans or veterans of the Vietnam era, or because of their medical condition (as defined in Section 12926 of the California Government Code), their ancestry, or their marital status; nor does the university discriminate on the basis of citizenship, within the limits imposed by law or university policy; nor does the university discriminate on the basis of sexual orientation. This nondiscrimination policy covers admission, access, and treatment in university programs and activities, and application for or treatment in university employment.

Persons who believe they have been subjected to discrimination have a right to file a grievance under applicable UCSD Policies and Regulations. For information on policies and grievance procedures, contact: Nolan Penn, Associate Chancellor; Bldg. 107 University Center, UCSD, La Jolla, CA 92093-0005; (619) 534-0195.

The University of California, San Diego (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; La Jolla, CA 92093-0015; (619) 534-4370

Robert C. Dynes; Senior Vice Chancellor, Academic Affairs; Sec. 504 Coordinator—Faculty; Bldg. 105 University Center, UCSD; La Jolla, CA 92093-0001; (619) 534-3130

Steve Relyea; Vice Chancellor, Business Affairs; Sec 504 Coordinator—Staff; Bldg. 110 University Center, UCSD; La Jolla, CA 92093-0007; (619) 534-3390

Jeffrey Steindorf; Assistant Vice Chancellor; ADA Coordinator; Bldg. 108 University Center, UCSD; La Jolla, CA 92093-0006; (619) 534-3059

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 the following locations:

Student Legal Services

Office of the Organizations and Leadership Opportunities

College Dean Offices

Office of Graduate Studies and Research

Office of the Student Affairs Dean, School of Medicine

Office of the Student Conduct Coordinator.

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 10.70 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.

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Persons who believe they have been subjected to discrimination have a right to file a grievance under applicable UCSD Policies and Regulations. For information on policies and grievance procedures, contact:

Nolan Penn, Associate Chancellor
Bldg. 107 UCtr., UCSD,
La Jolla, CA 92093-0005
(619) 534-0195

Joseph W. Watson
Vice Chancellor Student Affairs
Sec. 504 Coordinator—Students
Bldg. 112 UCtr., UCSD,
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Steve Relyea
Vice Chancellor Business Affairs
Sec. 504 Coordinator—Staff
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Marjorie Caserio
Vice Chancellor Academic Affairs
Sec. 504 Coordinator—Faculty
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(619) 534-3130

Jeffrey Steindorf
Assistant Vice Chancellor
ADA Coordinator
Bldg. 108 UCtr., UCSD,
La Jolla, CA 92093-0006
(619) 534-3059

The University of California, San Diego (UCSD) recognizes its obligation to provide program accessibility for persons with disabilities. For information regarding documentation of disability and related academic support services, please contact:

Roberta J. Gimblett, Director
Office for Students with Disabilities
Bldg. 202 UCtr., UCSD,
La Jolla, CA 92093-0019

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UCSD has issued policies applying to the disclosure of information from student records. These can be found in UCSD PPM160-2. These policies permit students to review their respective records maintained at UCSD and outline the procedures for challenging any inaccurate or misleading information contained in the records. Copies of these policies are available free of charge in the Student Policies and Judicial Affairs Office, located in the Student Center, Bldg. B. The complete text of the Federal Family Education Rights and Privacy Act of 1974 as amended is also available for review in the Government Documents section of Geisel Library at UCSD.

Questions about these rights should be referred to the director, Student Policies and Judicial Affairs, Nick Aguilar, in Bldg. B of the Student Center, telephone (619) 534-6225.

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The University of California, San Diego is committed to creating and maintaining a community in which all persons who participate in university programs and activities can work together in an atmosphere free from all forms of harassment, exploitation, or intimidation. Specifically, every member of the university community should be aware that the university is strongly opposed to sexual harassment and that such behavior is prohibited both by law and university policy. It is the intention of the university 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 Educational Amendments 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.

Certain basic legal issues are involved in most sexual harassment cases. These are factors that a government investigating agency or a court would look at to determine whether you have been sexually harassed.

- Was the conduct sexual in nature?
- Was the conduct unwelcome?
- Was the conduct severe or pervasive?
- Was the conduct unreasonable?

The Equal Opportunity Commission's definition describes two types of conduct considered to be sexual harassment: quid pro quo and hostile environment.

Quid pro quo

In more familiar vernacular, this is called a sex-for-jobs situation. In this form of sexual harassment, the alleged harasser is someone in a position of authority to affect the terms and conditions of employment or education. Unlike hostile environment sexual harassment, one incident can be enough in quid pro quo cases.

Hostile environment describes sexually offensive conduct that permeates the workplace, classroom, or academic department, making it difficult for employees or students to do their work. Harassers can be supervisors, co-workers, peers, customers, patrons, or visitors. The conduct is continuous, frequent, repetitive, and part of an overall pattern, rather than one event or several isolated incidents and rises to such a level that it interferes with the individual's performance.

Prevention and Training

The UCSD Office of Sexual Harassment Prevention and Policy (SHPP), (619) 534-8297, is available to faculty, staff, and students for training sessions concerning your rights to a university environment free from sexual harassment. Education on how to respond to sexual harassment complaints is available. A copy of the Policy and Procedures is available at the SHPP Office at 201 University Center, where you may review it freely. UCSD welcomes your suggestions for improvements.

Filing Complaints

If you believe you have been sexually harassed, you are encouraged to discuss your options and learn about campus procedures by talking with an information advisor as listed in the campus directory under Sexual Harassment. You may file a formal written complaint with the SHPP Director, June C. Terpstra at (619) 534-8297/8298; the California Department of Fair Employment and Housing within 365 days of the alleged unlawful conduct; the U.S. Equal Employment Opportunity Commission within 300 days of the last incident of harassment; or as a law suit in court.

Retaliation

Any student, staff, or faculty bringing a sexual harassment complaint or assisting in investigating such a complaint will not be adversely affected in terms and conditions of education or employment.

Complaints of such retaliation will be promptly investigated and punished.

Grievances

If the complainant is not satisfied with the conclusions reached at the preliminary inquiry stage or final case disposition, the SHPP director shall advise the complainant of the formal grievance procedures.

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Salary and Employment Information-UCSD Bachelor's Degree Recipients

The salary averages are figured according to occupational classifications.

Occupation	Average Salary
Technical	$31,088
Managerial	$25,250
Sales/Marketing	$23,295
Health/Life Sciences	$22,126
Finance	$24,382
Human Services	$17,829
Communications	$20,986

The employment status of the graduates who sought to enter the workforce is as follows:

Employed full time	75%
Employed part time	18%
Seeking employment	7%

Source: UCSD Graduates—*A Summary of 1994 Survey Results.* Information based only on those who sought to enter the workforce immediately after graduation. Survey conducted of June 1994 graduates in December 1994.

UCSD Facts and Figures (as of Fall 1995)

On-campus student enrollment
- Undergraduate 14,846
- Muir 3,447
- Revelle 3,057
- Marshall 3,004
- Warren 3,503
- Roosevelt 1,835
- Graduate 2,255
- Medical School (excluding 524 Medical Center residents and interns, including 196 graduate academics) 699
  - Total Students 17,800

On-campus teaching faculty members 1,400

Members of Honorary Societies/Prizes/Awards
- American Academy of Arts and Sciences fellows 67
- American Philosophical Society fellows 12
- Econometric Society fellows 5
- Fields Medal Recipients 1
- Guggenheim fellows 132
- Institute of Arts and Letters 3
- Institute of Medicine members 10
- International Academy of Astronautics members 6
- National Academy of Education members 2
- National Academy of Engineering members 13
- National Academy of Sciences members 51
- National Medal of Science recipients 4
- Nobel Prize laureates 5
- Pulitzer Prize Recipients 1

Total land area—UCSD
- Main campus 1,157
- Outlying areas 405
- UC Natural Reserves 414
  - Total acres 1,976

Books in library collection 2,366,019
UCSD Extension enrollment 36,372

Grade-point averages
- Lower-division undergraduate 2.89
- Upper-division undergraduate 3.00
- Graduate 3.72

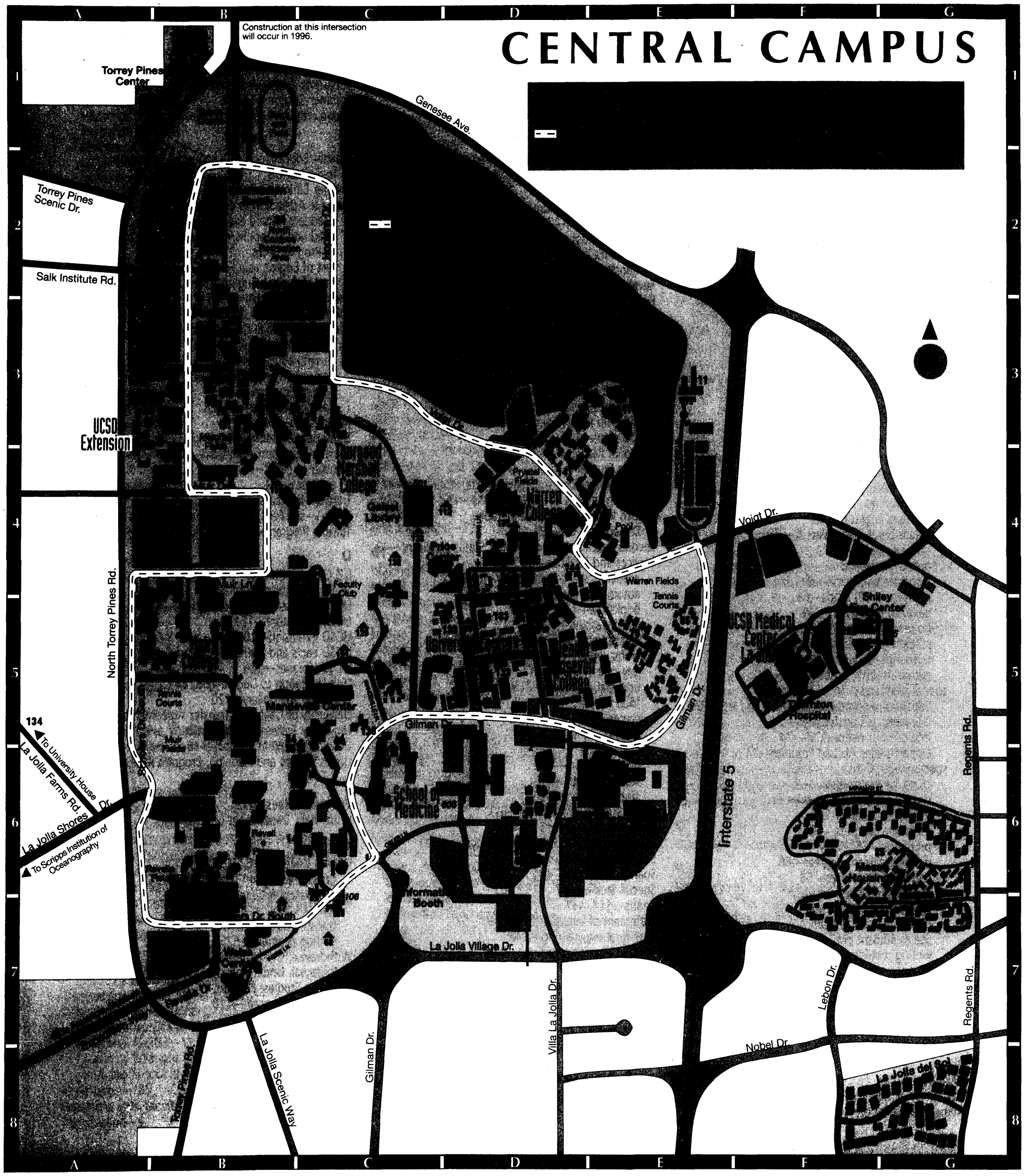
Number of undergraduates in most populous departments
- Biology 3,824
- Psychology 1,062
- Applied Mechanics and Engineering Sciences 1,034
- Economics 757
- Political Science 675
- Computer Science and Engineering 626
- Chemistry and Biochemistry 577
- Electrical and Computer Engineering 546
- Communication 515
- Literature 481
- Bioengineering 400
- History 358
- Sociology 340
- Visual Arts 279

Based upon previous three years' experience, approximately 95 percent of all undergraduates enrolled at UCSD in the fall quarter will also be enrolled for the spring quarter. Questions or requests for more detailed information should be directed to the Campus Planning Office.

Index

UNIVERSITY OF CALIFORNIA, SAN DIEGO

CENTRAL CAMPUS



Campus Map Legend

STRUCTURES

1 Africa Hall ... D5
2 Applied Physics and Mathematics Bldg. ... B4
3 Argo Hall ... B6
4 Ash ... D6
5 Asia Hall ... D5
6 Atlantis Hall ... B6
7 Basic Science Bldg. ... D6
8 Beagle Hall ... B6
9 Beech (Clinical Research) ... D6
10 Biology Bldg. ... B5
11 Biology Field Station ... E3
12 Biomedical Library ... D6
13 Blake Hall ... B6
14 Bonner Hall ... C6
15 Bookstore, UCSD ... D4
16 Campus Services Complex ... E4
17 Cancer Research Facility, Bldg. 303 University Center ... D5
18 Canyonview Aquatic and Racquetball Facility ... E4
19 Canyon Vista Administration Bldg. ... D3
20 Career Services Center ... C5
21 Cedar ... D6
22 Cellular and Molecular Medicine West ... C6
23 Center for Magnetic and Recording Research Bldg. ... D4
24 Center for Molecular Genetics Bldg. ... C6
25 Center for Research in Computing and the Arts, Bldg. 408 University Center ... D5
26 Center Hall (under construction) ... C6
27 Central Utilities ... B6
28 Challenger Hall ... C7
29 Che Cafe (food) ... B4
30 Chemistry Research Bldg. ... C5
31 Clinical Research Facility ... D6
32 Clinical Sciences Bldg. ... D6
33 Club Med (food) ... D6
— Coast Apartments (see SIO map, 09)
34 Cognitive Science Bldg. ... C4
35 Copley International Conference Center ... B3
36 Crafts Center ... C6
37 Credit Union ... D5
38 Date ... D6
39 Discovery Hall ... B6
40 *Drinking Fountain (untitled)*, Michael Asher ... D5
41 Early Childhood Education Center ... F6
42 Earth Hall ... E5
43 Economics Bldg. ... B3
44 Engineering Bldg. ... D4
45 Engineering Bldg. Unit II ... D4
46 Europe Hall ... E5
47 Evergreen ... D6
48 Faculty Club, Ida and Cecil Green ... C5
49 Fir ... D6
50 Galathea Hall ... B6
51 Galbraith Hall ... B6
51A Geisel Library ... C4
52 Gildred Latin American Studies Bldg. ... B2
53 *Green Table*, Jenny Holzer ... B5
54 Grove Gallery ... C5
55 Guava ... D6
56 Gymnasium ... B5
57 Health Center, Student ... C4
58 High Bay Physics Laboratory ... D4
59 Humanities and Social Sciences Bldg. ... B5
60 Information Booths ... B2, C6
61 Institute of the Americas Bldg. ... B3
62 Internal Medicine Group ... D6
63 Internal Medicine Specialty Offices ... D6
64 International Center ... C5
65 International House ... E5
66 La Jolla del Sol ... G8
67 *La Jolla Project*, Richard Fleischner ... B7
68 *La Jolla Vista View*, William Wegman ... C7
69 Latin America Hall ... E5
70 Literature Bldg. ... D4
71 Mandell Weiss Forum ... B7
72 Mandell Weiss Theatre ... B7
73 Mandeville Center ... C5
74 Marshall College Admin. Bldg. ... B4
75 Marshall College Apartments I and II ... B3, C3
76 Marshall College Commons ... C4
77 Marshall College Residence Halls ... B3
78 Materials Handling Facility ... E3
79 Matthews Apartments (Revelle Apartments) ... E5
80 Mayer Hall ... C6
81 McGill Hall ... B5
82 Media Center/Communication Bldg. ... B4
83 Medical Genetics Bldg. ... D6
84 Medical Teaching Facility ... D6
85 Mesa Apartments ... G6
86 Meteor Hall ... B6
87 Middle East Hall ... E5
88 Molecular Biology Research Facility 3 ... C6
89 Muir College Apartments ... B5
90 Muir Commons (food) ... B5
91 Multispecialty Practice Facility ... D6
92 Natatorium ... B5
93 North America Hall ... E5
94 North Campus Recreation Area ... B1, 2
95 Oceania Hall ... E5
96 Oceanview Terrace (food) ... B3
97 Pacific Hall ... B6
98 Pepper Canyon Apartments ... E5
99 Perlman Ambulatory Care Center ... F5
100 Peterson Hall ... B4
101 Price Center ... D4
102 Ratner Children's Eye Center (under construction) ... F5
103 Recreation Gymnasium ... B6
104 Revelle College Provost Bldg. ... C7
105 Revelle Commons (food) ... B6
106 RIMAC—Recreation and Intramural Athletic Complex ... C2
107 Robinson Bldg. Complex—International Relations and Pacific Studies Graduate School ... B3
108 San Diego Supercomputer Center ... B3
109 Science Engineering Research Facility (SERF) ... D4
110 Sequoyah Hall ... B3
111 Shiley Eye Center ... F5
112 *Snake Path*, Alexis Smith ... D4
113 Social Sciences Building ... B3
114 Solis Hall ... C4
115 *Something Pacific*, Nam June Paik ... B4
116 Spanos Athletic Training Facility ... B1
117 Structural Components Laboratory, Charles Lee Powell ... D4
118 Structural Systems Laboratory, Charles Lee Powell ... D4
119 Student Center ... C5
120 Student Center, Bldg. B ... C5
121 *Sun God*, Niki de Saint Phalle ... C5
122 Tenaya Hall ... B4
123 *Terrace*, Jackie Ferrara ... C6
124 Thornton Hospital—The John M. and Sally B. Thornton Hospital ... F5
125 Tioga Hall ... B5
126 Torrey Pines Center North, 10300 North Torrey Pines Rd. ... B1
127 Torrey Pines Center South, 10280 North Torrey Pines Rd. ... A1
128 *Trees*, Terry Allen ... C4
129 *Two Running Violet V Forms*, Robert Irwin ... C5
130 UCSD Extension Complex ... A3
131 *UNDA*, Ian Hamilton Finlay ... B3
132 University Art Gallery ... B5
133 **UNIVERSITY CENTER**
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Buildings 201–203 University Center ... D5
Buildings 214–215 University Center ... C5
Buildings 301–303 University Center ... D5
Buildings 309–310 University Center ... D5
Buildings 400–413 University Center ... D5
Buildings 500–518, 514–516 University Center ... D4
134 University House, 9630 La Jolla Farms Rd. ... A6
136 Urey Hall ... B6
137 Urey Hall Addition ... B6
138 Veterans Affairs Medical Center ... E6
139 *Vices and Virtues*, Bruce Nauman ... D4
140 Visual Arts Facility ... D5
141 Warren College Residence Halls and Apartments ... E3
142 Warren Lecture Halls ... D4
— Weiss Center ... B7
143 York Hall ... C6

SERVICES, CENTERS, INSTITUTES, AND ACADEMIC AND ADMINISTRATIVE DEPARTMENTS

133 Academic Senate, Bldg. 215 University Center ... C5
144 Admissions—Graduate, Bldg. 520 Roosevelt College ... D4
84 Admissions—School of Medicine, 162 Medical Teaching Facility ... D6
133 Admissions—Undergraduate, Bldg. 301 University Center ... D5
133 Alumni Relations, Bldg. 202 University Center ... D5
113 Anthropology Dept., Social Sciences Bldg. ... B3
44 Applied Mechanics and Engineering Sciences Dept., Engineering Bldg. ... D4
70 Arts and Humanities, Dean's Office, Literature Bldg. ... D4
44 Bioengineering Dept., Engineering Bldg. ... D4
14 Biology Dept., Bonner Hall ... C6
101 Box Office, Price Center ... D4
133 Bursar's Office, Bldg. 201 University Center ... D5
133 Campus Planning Office, Bldg. 108 University Center ... D5
133 Cashier, Bldg. 401 University Center ... D5
2 CASS—Center for Astrophysics and Space Sciences, Applied Physics and Mathematics Bldg. ... B4
45 CECR—Center for Energy and Combustion Research, EBU II ... D4
22 Cellular and Molecular Medicine, Division of, CMM Facility ... C6
133 Chancellor's Office, Bldg. 107 University Center ... D5
137 Chemistry and Biochemistry Dept., Urey Hall Addition ... B6
81 CHIP—Center for Human Information Processing, McGill Hall ... B5
52 CILAS—Center for Iberian and Latin American Studies, Gildred Latin American Studies Bldg. ... B2
80 CIMS—Center for Interface and Materials Science, Mayer Hall ... C6
24 CMG—Center for Molecular Genetics, CMG Bldg. ... C6
23 CMRR—Center for Magnetic Recording Research, CMRR Bldg. ... D4
34 Cognitive Science Dept., Cognitive Science Bldg. ... C4
82 Communication Dept., Media Center/Communication Bldg. ... B4
2 Computer Science and Engineering Dept., Applied Physics and Mathematics Bldg. ... B4
2 Computing Services, Academic, Applied Physics and Mathematics Bldg. ... B4
133 Conference Room 111A, Bldg. 111 University Center ... D5
145 Conference Services, Fireside Lounge ... C3
25 CRCA—Center for Research in Computing and the Arts, CRCA Bldg. ... D5
34 CRL—Center for Research in Language, Cognitive Science Bldg. ... C4
126 Development Office, Torrey Pines Center North ... B1
120 Early Outreach Services (Partnership, Partners, Upward Bound), Student Center, Bldg. B ... C5
43 Economics Dept., Economics Bldg. ... B3
— Eleanor Roosevelt College (see Roosevelt College)
44 Electrical and Computer Engineering Dept., Engineering Bldg. ... D4
127 Employment, Staff, Torrey Pines Center South ... A1
20 Employment, Student, Career Services Center ... C5
44 Engineering, School of, Dean's Office, Engineering Bldg. ... D4
113 Ethnic Studies Dept., Social Sciences Bldg. ... B3
38 Family and Preventive Medicine Dept., Date ... D6
133 Financial Services-Student, Bldg. 201 University Center ... D5

FOOD SERVICES
105 Anchorview (Revelle Commons) ... B6
19 Canyon Vista (Canyon Vista Administration Bldg.) ... D3
28 Che Cafe ... C7
33 Club Med ... D6
105 The Deli (Revelle Commons) ... B6
19 Earl's Place (Canyon Vista Administration Bldg.) ... D3
119 Grove Caffe (Student Center) ... C5
76 La Casa (Marshall College Commons) ... C4
76 The Munch Box (Marshall College Commons) ... C4
90 Rathskellar (Muir Commons) ... B5
96 Oceanview Terrace ... B3
101 Price Center ... D4
101 Sunshine Store (Price Center) ... D4
90 Top of the Quad (Muir Commons) ... B5
7 Garren Auditorium, Basic Science Bldg. ... D6
144 Graduate Studies and Research Office, Bldg. 520 Roosevelt College, 2nd floor ... D4
16 Graphics & Reproduction Services, Campus Services Complex ... E4
119 Grove Caffe (food), Student Center ... C5
59 History Dept., Humanities and Social Sciences Bldg. ... B5
120 Housing (off-campus), Student Center, Bldg. B ... C5
133 Housing (on-campus), Bldg. 310 University Center ... D5
22 Howard Hughes Medical Institute, CMM West ... C6
44 IBME—Institute for Biomedical Engineering, Engineering Bldg. ... D4
130 ICL—Institute for Continued Learning, UCSD Extension Complex, rm. 122 ... A3
107 IGCC—Institute on Global Conflict and Cooperation, Robinson Bldg. Complex ... B3
80 IIRPA—Intercampus Institute for Research at Particle Accelerators, Mayer Hall ... C6
34 INC–Institute for Neural Computation, Cognitive Science Bldg. ... C4
23 INLS–Institute for Nonlinear Science, CMRR Bldg. ... D4
107 International Relations and Pacific Studies, Graduate School of, Robinson Bldg. Complex ... B3
136 IPAPS–Institute for Pure and Applied Physical Sciences, Urey Hall ... B6
133 ITER (International Thermonuclear Energy Reactor) Home Team, Bldg. 302 University Center ... D5
144 LCHC–Laboratory for Comparative Human Cognition, Bldg. 517 Roosevelt College, 2nd floor ... D4

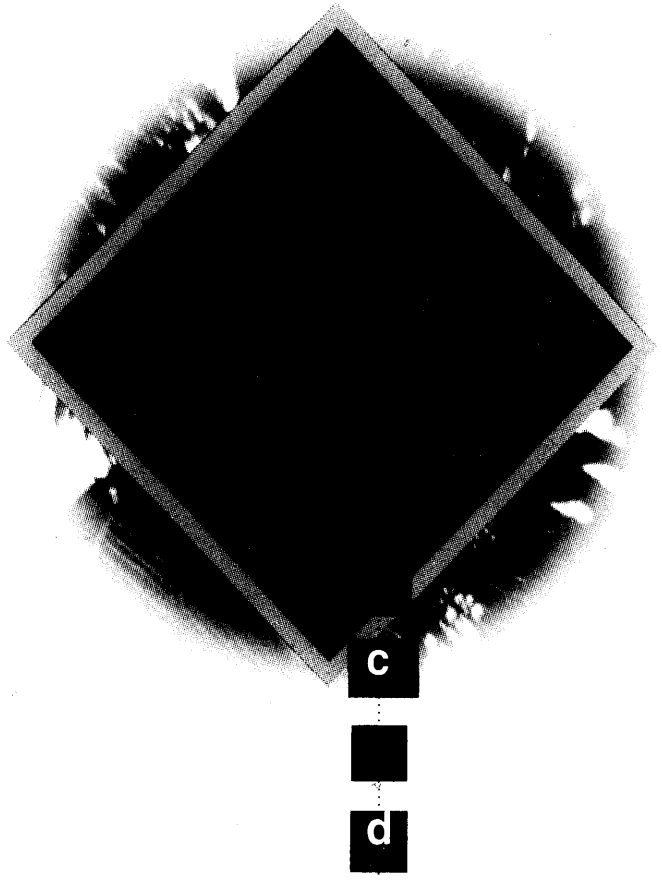
LIBRARIES
51A Art and Architecture, Geisel Library ... C4
12 Biomedical ... D6
51A Geisel Library ... C4
107 International Relations and Pacific Studies ... B3
51A Science and Engineering, Geisel Library ... C4
51 Undergraduate, Galbraith Hall ... B6
7 Liebow Auditorium, Basic Science Bldg. ... D6
81 Linguistics Dept., McGill Hall ... B5
70 Literature Dept., Literature Bldg. ... D4
2 LMS-Laboratory for Mathematics and Statistics, Applied Physics and Mathematics Bldg. ... B4
125 Mandeville Suite, Tioga Hall ... B5
2 Mathematics Dept., Applied Physics and Mathematics Bldg. ... B4
59 Muir College Provost, Humanities and Social Sciences Bldg., rm. 2126 ... B5
122,125 Muir College Residence Halls ... B4,5
73 Music Dept., Mandeville Center ... C5
137 Natural Sciences, Dean's Office, Urey Hall Addition ... B6
55 Neurosciences Dept., Guava ... D6
111 Ophthalmology Dept., Shiley Eye Center ... F5
133 Orthopaedics Dept., Bldg. 202 University Center ... D5
133 Parking and Transportation Services, Bldg. 400 University Center ... D5
7 Pathology Dept., Basic Science Bldg. ... D6

PATIENT SERVICES
91 Assisted Reproductive Technologies, Multispecialty Practice Facility ... D6
99 Cardiology, Perlman Ambulatory Care Center ... F5
99 Head and Neck, Perlman Ambulatory Care Center ... F5
21 Family Medicine, Cedar ... D6
99 Neurology, Perlman Ambulatory Care Center ... F5
111 Ophthalmology, Shiley Eye Center ... F5
— Orthopaedics, UCSD OrthoMed, 4150 Regents Park Row, Suite 300 (off Regents Rd.)
91 Pediatrics, Multispecialty Practice Facility ... D6
21 Pharmacy, Cedar ... D6
62 Radiology, Internal Medicine Group ... D6
99 Reproductive Medicine, Perlman Ambulatory Care Center ... F5
9 Senior Care, Beech ... D6
99 Surgery, Perlman Ambulatory Care Center ... F5
124 Urgent Care, Thornton Hospital ... F5
47 Pediatrics Dept. Administration, Evergreen ... D6

PERSONNEL
133 Academic, Bldg. 402 University Center ... D5
127 Staff, Torrey Pines Center South ... A1
7 Pharmacology Dept., Basic Science Bldg. ... D6
51 Philosophy Dept., Galbraith Hall ... B6
137 Physics Dept., Urey Hall Addition ... B6
133 Police, Bldg. 500 University Center ... D4
113 Political Science Dept., Social Sciences Bldg. ... B3
101 Post Office, Price Center ... D4
81 Psychology Dept., McGill Hall ... B5
18 Recreation Office, Canyonview Aquatic and Racquetball Facility ... E4
133 Registrar, Bldg. 301 University Center ... D5
— Revelle College Residence Halls ... B6
105 Revelle Formal Lounge, Revelle Commons ... B6
133 Roosevelt College Administration, Bldg. 412 University Center ... D5

SCHOOL OF MEDICINE
84 Admissions, Medical Teaching Facility, rm. 162 ... D6
47 Continuing Medical Education, Evergreen ... D6
7 Dean's Office, Basic Science Bldg./Admin. Wing ... D6
84 Financial Aid, Medical Teaching Facility, rm. 166 ... D6
84 Student Affairs, Medical Teaching Facility, rm. 180 ... D6
113 Social Sciences, Dean's Office, Social Science Bldg. ... B3
113 Sociology Dept., Social Sciences Bldg. ... B3
7 Southwest Electron Microscopy Resource, Basic Science Bldg. ... D6
32 Stein Institute for Research on Aging, Clinical Sciences Bldg. ... D6

STUART COLLECTION
40 *Drinking Fountain (untitled)*, Michael Asher ... D5
53 *Green Table*, Jenny Holzer ... B5
67 *La Jolla Project*, Richard Fleischner ... B7
68 *La Jolla Vista View*, William Wegman ... C7
112 *Snake Path*, Alexis Smith ... D4
115 *Something Pacific*, Nam June Paik ... B4
121 *Sun God*, Niki de Saint Phalle ... C5
123 *Terrace*, Jackie Ferrara ... C6
128 *Trees*, Terry Allen ... C4
129 *Two Running Violet V Forms*, Robert Irwin ... C5
131 *UNDA*, Ian Hamilton Finlay ... B3
139 *Vices and Virtues*, Bruce Nauman ... D4
101 Student Information (EDNA), Price Center ... D4
120 Student Outreach and Recruitment, Student Center, Bldg. B ... C5
130 Summer Session, UCSD Extension Complex ... A3
144 Teacher Education Program, Bldg. 517 Roosevelt College ... D4
126 Technology Transfer, Office of, Torrey Pines Center North ... B1
51 Theatre Dept., Galbraith Hall ... B6
61 USMEX—Center for U.S.–Mexican Studies, Institute of the Americas Bldg. ... B3
126 University Communications, Torrey Pines Center North ... B1
133 Vice Chancellor, Academic Affairs, Bldg. 105 University Center ... D5
133 Vice Chancellor, Business Affairs, Bldg. 110 University Center ... D5
133 Vice Chancellor, Development and University Relations, Bldg. 108 University Center ... D5
7 Vice Chancellor, Health Sciences, Basic Science Bldg. ... D6
133 Vice Chancellor, Research, Bldg. 105 University Center ... D5
133 Vice Chancellor, Resource Management and Planning, Bldg. 109 University Center ... D5
133 Vice Chancellor, Student Affairs, Bldg. 112 University Center ... D5
73 Visual Arts Dept., Mandeville Center ... C5
70 Warren College Provost, Literature Bldg. ... D4



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