

UNIVERSITY OF CALIFORNIA, SAN DIEGO



UNIVERSITY
GENERAL
CATALOG

CORRESPONDENCE DIRECTORY

Campus Directory Information

(619) 534-2230

UNDERGRADUATE

Admissions	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, 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 210, Matthews Administrative and Academic Complex, 0013, 534-4480
Foreign Students' Affairs	Office of International Education	International Center, 0018, 534-3730
Housing On-Campus Off-Campus	Housing Administration Office of Housing Services	Building 206, Matthews Administrative and Academic Complex, 0041, 534-4010 Student Center Building B, 0309, 534-3670
Part-Time Employment On-Campus Off-Campus	Career Services Center	Career Services Center, 0330, 534-4500
Provosts Fifth College Muir College Revelle College Third College Earl Warren College	Building 412 H&SS Building, Room 2126 Revelle Provost Building Third College Admin. Building Literature Building, Room 3210	Matthews Administrative and Academic Complex, 0069, 534-2235 Muir Campus, 0106, 534-3583 Revelle Campus, 0321, 534-3262 Third Campus, 0509, 534-4002 Warren Campus, 0422, 534-4350
Registration	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, 0021A, 534-3150
Residence Status	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, 0021A, 534-3152
Scholarships	Student Financial Services	Building 214, Matthews Administrative and Academic Complex, 0013, 534-4480
Student Activities	Price Center	Price Center, 0078, 534-4090

GRADUATE

Dean of Graduate Studies and Research	Office of Graduate Studies and Research	Building 518, Fifth College, 0003, 534-3555
Admissions	(Address the appropriate department of instruction.)	
Affirmative Action	Office of Graduate Studies and Research	Building 518, Fifth College, 0003, 534-3871
Fellowships	Office of Graduate Studies and Research	Building 518, Fifth College, 0003, 534-3556
Financial Aids (Loans and Grants)	Student Financial Services	Building 210, University Center, 0013, 534-3807
Graduate Women's Program	Office of Graduate Studies and Research	Building 518, Fifth College, 0003, 534-3550
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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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.

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ACADEMIC AND ADMINISTRATIVE CALENDAR, 1993-94

Fall Quarter, 1993

Fall quarter begins	Monday, September 20
Instruction begins	Thursday, September 23
Thanksgiving holiday	Thursday-Friday, Nov. 25-26
Instruction ends	Friday, December 3
Final exams	Monday-Saturday, December 6-11
Fall quarter ends	Saturday, December 11
Christmas holidays	Thursday-Friday, Dec. 23-24
New Year holidays	Thursday-Friday, Dec. 30-31

Winter Quarter, 1994

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

Spring Quarter, 1994

Spring quarter begins	Friday, March 25
Instruction begins	Monday, March 28
Memorial Day holiday observance	Monday, May 30
Instruction ends	Friday, June 3
Final exams	Monday-Saturday, June 6-11
Spring quarter ends	Saturday, June 11
Commencement	Saturday/Sunday, June 11/12
Independence Day holiday	Monday, July 4
Labor Day holiday	Monday, September 5

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University of California, San Diego 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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93/94

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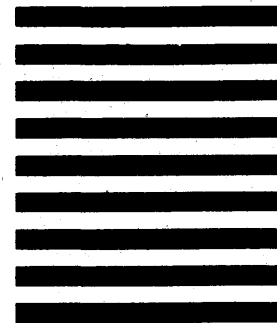
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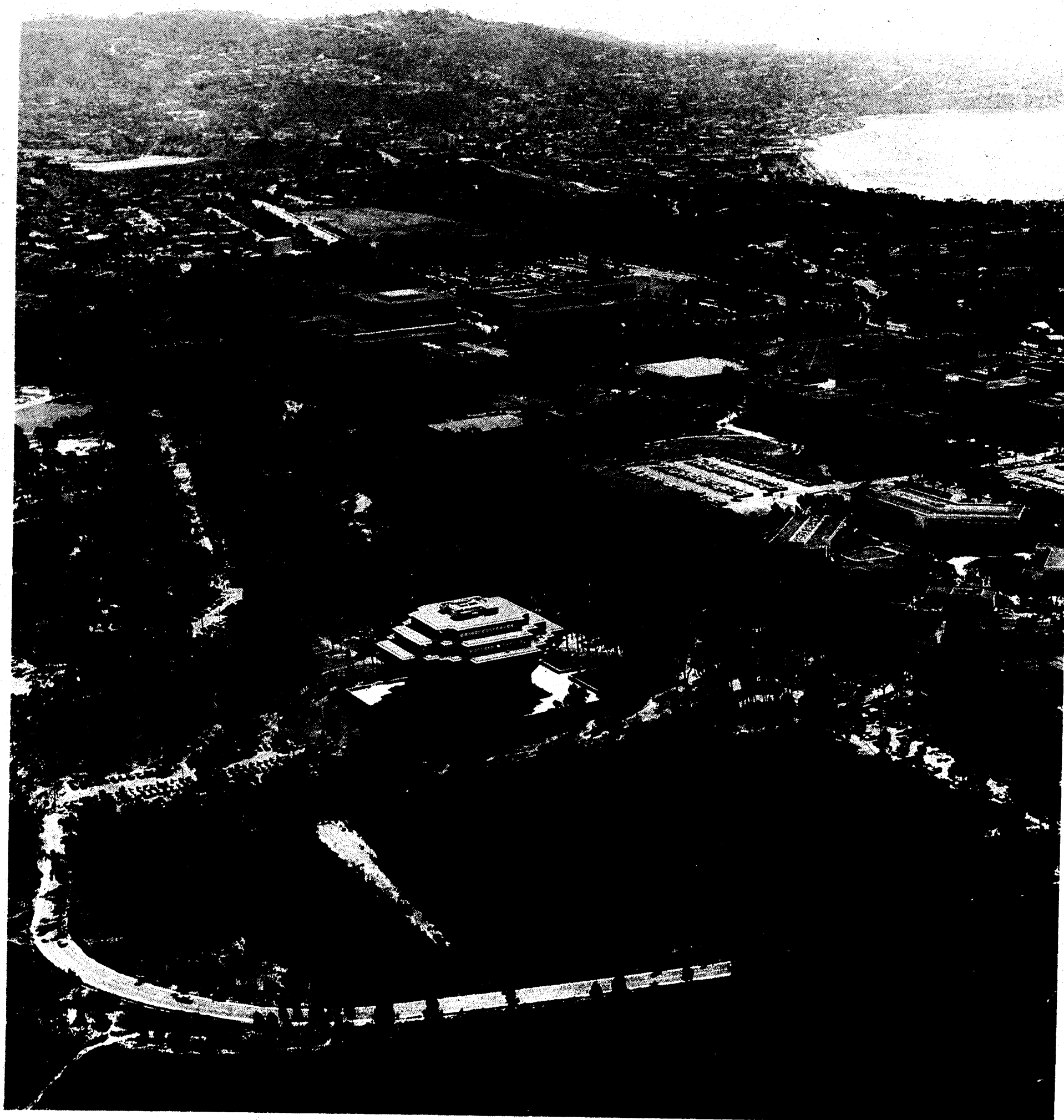
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UNDERGRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES

	Fall Quarter 1993	Winter Quarter 1994	Spring Quarter 1994
ADMISSION Opening date for filing application materials	Nov. 1, '92	*July 1, '93	*Oct. 1, '93
PRIORITY DEADLINE* FOR APPLICATIONS FOR FINANCIAL AID	March 2, '93	Nov. 1, '93	Feb. 1, '94
PRIORITY TELEPHONE ENROLLMENT 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.	May 5-30	Nov. 3-30	Feb. 9-Mar. 6
BILLING STATEMENTS MAILED TO ENROLLED STUDENTS	Aug. 11-Sept. 17	Dec. 1-17	March 1-14
OPEN ENROLLMENT 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.	May 31-Sept. 17	Dec. 1-22	March 7-18
NEW STUDENT ENROLLMENT	June 14-Sept. 17	Dec. 6-17	March 14-18
DEADLINE DAY TO ENROLL WITHOUT LATE FEES Students who have not enrolled will be assessed \$100 in late fees. (\$50 late enrollment fee and \$50 late payment fee)	Sept. 3	Dec. 22	March 18
QUARTER BEGINS	Sept. 20	Jan. 3	March 25
LAST DAY FOR STUDENTS WHO MET ENROLLMENT DEADLINE TO PAY REGISTRATION FEES WITHOUT \$50 LATE PAYMENT FEE	Sept. 3	Dec. 22	March 18
LAST DAY FOR STUDENTS ON FINANCIAL AID, SCHOLARSHIPS, AND FULL FEE WAIVERS TO SIGN AND RETURN STATEMENT FORM IF NOT ATTENDING	Sept. 3	Dec. 22	March 18
LATE REGISTRATION PERIOD FOR ALL STUDENTS	Sept. 23-Oct. 8	Jan. 3-14	Mar. 28-Apr. 8
INSTRUCTION BEGINS	Sept. 23	Jan. 3	March 28
ADD/CHANGE/DROP PERIOD	Sept. 23-Oct. 8	Jan. 3-14	Mar. 28-Apr. 8
DEADLINE DAY TO PAY REGISTRATION FEES TO AVOID CANCELLATION OF CLASSES	Oct. 8	Jan. 14	April 8
FINAL DAY TO ADD COURSES	Oct. 8	Jan. 14	April 8
LAST DAY TO APPLY FOR PART-TIME STATUS	Oct. 8	Jan. 14	April 8
CHANGE/DROP PERIOD CONTINUES Last day to drop without "W" Last day to change grading option, change variable units Last day to drop with "W" or final grade must be assigned	Oct. 11-Nov. 29 Oct. 22 Oct. 22 Nov. 29	Jan. 18-Mar. 4 Jan. 28 Jan. 28 March 4	Apr. 11-May 27 April 22 April 22 May 27
INSTRUCTION ENDS	Dec. 3	March 11	June 3
FINAL EXAMINATIONS	Dec. 6-11	March 14-19	June 6-11
FINAL DAY TO FILE "REQUEST TO RECEIVE GRADE INCOMPLETE"	Dec. 10	March 18	June 10
QUARTER ENDS	Dec. 11	March 19	June 11
COMMENCEMENT			June 11/12

*If open—contact Undergraduate Admissions for details, (619) 534-0087.

GRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES

Fall Quarter 1993

ADMISSION

Applicants should check with their prospective departments for deadline dates.

APPLICATIONS FOR FELLOWSHIPS

Deadline date for filing application materials

Jan. 15 '93

Notice of awards

April 1

Acceptance of awards

April 15

(NOTE: Most departments adhere to these dates for assistantships also, but many will accept later applications.)

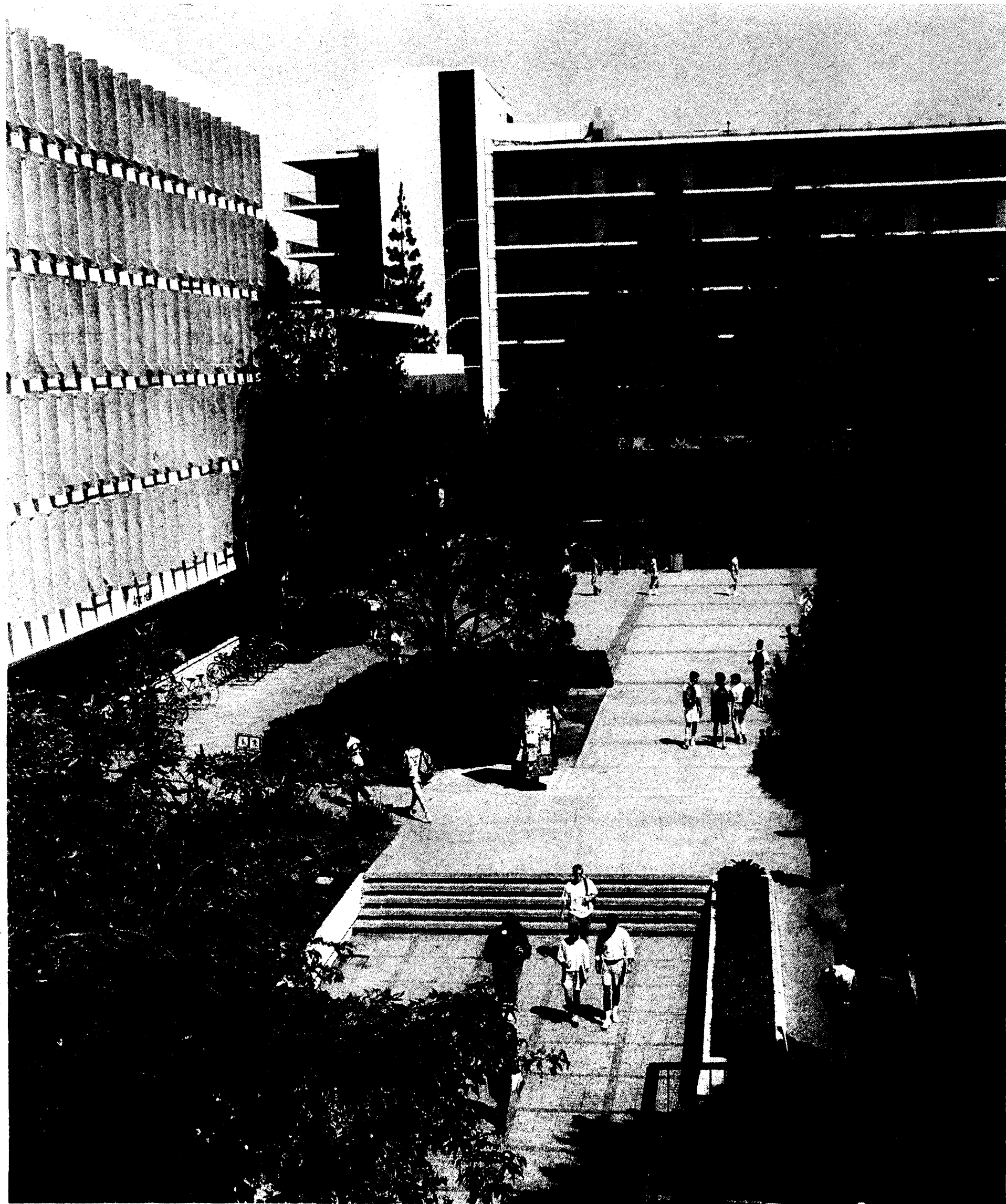
DEADLINE FOR APPLICATIONS FOR FINANCIAL AID

March 2

GRADUATE ENROLLMENT DEADLINES

	Fall Quarter 1993	Winter Quarter 1994	Spring Quarter 1994
TELEPHONE PRIORITY ENROLLMENT: CONTINUING STUDENTS	May 5-June 1	Nov. 3-30	Feb. 9-Mar. 6
OPEN ENROLLMENT	May 31-Sept. 17	Dec. 1-22	Mar. 7-18
NEW STUDENT ENROLLMENT	June 14-Sept. 17	Dec. 6-17	Mar. 14-18
APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM	Aug. 23	Dec. 6	Feb. 25
FILING APPROVED LEAVE OF ABSENCE	Oct. 8	Jan. 14	April 8
SCHOOL OF MEDICINE DEADLINES (Refer to School of Medicine announcement for deadlines.)			
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. 17	Dec. 22	March 18
QUARTER BEGINS	Sept. 20	Jan. 3	March 25
INSTRUCTION BEGINS	Sept. 23	Jan. 3	March 28
LATE REGISTRATION			
Last day for students who met enrollment deadline to pay registration fees without \$50 late payment fee	Sept. 17	Dec. 22	March 18
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. 17	Dec. 22	March 18
DEADLINE FOR CHANGE OF PROGRAM	Oct. 8	Jan. 14	April 8
DEADLINE TO CHANGE OF GRADING OPTION	Oct. 22	Jan. 28	April 22
DEADLINE FOR DROPPING CLASSES WITHOUT "W" APPEARING ON THE TRANSCRIPT	Oct. 22	Jan. 28	April 22
MASTER'S DEGREE			
Filing for advancement to candidacy	Oct. 8	Jan. 14	April 8
Filing approved thesis	Dec. 10	March 18	June 3
DOCTOR OF PHILOSOPHY DEGREE			
Filing draft dissertation with doctoral committee	Nov. 11	Feb. 18	May 6
Filing approved dissertation and related materials	Dec. 10	March 18	June 3
DROPPING CLASSES WITHOUT PENALTY OF "F" GRADE	Nov. 29	March 4	May 27
INSTRUCTION ENDS	Dec. 3	March 11	June 3
FINAL EXAMINATIONS	Dec. 6-11	March 14-19	June 6-11
REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 10	March 18	June 10
QUARTER ENDS	Dec. 11	March 19	June 11
COMMENCEMENT			June 12
COMPLETION OF REQUIREMENTS			
Final date for completion of all requirements for degrees to be awarded at end of quarter	Dec. 11	March 19	June 11

Dates are subject to change.



INTRODUCTION

A MAJOR DECISION

Choosing a college or university is clearly among the most decisive choices of a lifetime. The direction and tenor of a student's future will inevitably be deeply influenced by the experiences of the undergraduate years. The choice of a college or university should, therefore, be made with seriousness and deliberation, not casually.

At this moment, you may be considering the merits of several institutions of higher learning in order to make an informed and intelligent choice. What qualities and assets might make UCSD attractive to you? What might make you decide to apply elsewhere?

These and other related questions will be addressed in this brief introduction. The information presented here should help you to decide whether UCSD can provide the kind of education for which you are best suited.

For it should be clearly understood that UCSD exists primarily for one fundamental purpose: to educate. UCSD is intellectually challenging and academically intensive. Although its site is appealing, UCSD is not a coastal playground in which to amuse oneself while waiting to enter "the real world." UCSD is, in fact, a significant part of the real world; it is a *working* university which fosters effort and honors achievement.

The student who enters UCSD with this concept clearly in mind will find the experience of the undergraduate years here powerfully rewarding. The rewards will come not only in intellectual satisfaction, but also in philosophical enrichment and in the benefits of social life. Here at UCSD, on the bluffs overlooking the Pacific, students work and live in an environment shared with a faculty whose research and teaching are recognized for excellence virtually around the world. And here, on this beautiful 1,200-acre wooded campus, students make friendships that will carry meaning all their lives.

A FEW WORDS OF 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. UCSD is unique not only in those features, but also in its history.

As a member of the nine-campus family of the University of California, UCSD is, despite its newness, fully 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. The regents approved a new School of Architecture in 1988, and it accepted its first students in fall 1992. At both the undergraduate and graduate levels, UCSD's curricula and programs have been singled out for high rankings 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 and its small but distinguished staff of scientists formed the nucleus around which the new campus was to grow.

Today UCSD is recognized throughout the academic world both for the eminence of its faculty and for the quality of its graduate and undergraduate programs. The history of its growth may help to explain how, in the short span of some three decades, UCSD has been able to achieve a stature comparable to that of

institutions which were founded a century or more ago.

The growth of UCSD did not happen by accident. The rise to distinction resulted from wise and careful planning by visionary faculty and administrators. To accomplish the bold objective of creating a first-rate university in a remarkably short time, these planners sought from the outset to attract the best scholars the academic world could offer and to build the new campus around them.

Thanks to the foresight of those planners, the faculty of UCSD now includes six Nobel laureates (four of whom hold joint appointments with the nearby Salk Institute); one winner of the Fields Medal in mathematics; six recipients of the National Medal of Science; one winner of the Pulitzer Prize; fifty-six members of the National Academy of Sciences; sixty-two Fellows of the American Academy of Arts and Sciences; ten Fellows of the American Philosophical Society; six fellows of the Econometric Society; twelve members of the National Academy of Engineering; seven members of the International Academy of Astronautics; ten members of the Institute of Medicine; and three members of the National Academy of Education.

UCSD houses a chapter of Phi Beta Kappa, the oldest, most prestigious 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.

The vision of UCSD's planners is being fulfilled as well through the distinguished reputation of the programs and curricula offered by its much-honored faculty.

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

OTHER POINTS TO CONSIDER

There are certain other facts about UCSD which you should consider in making your choice. Among them are:

- UCSD, a full-fledged, four-year undergraduate campus, is also a full-fledged graduate

INTRODUCTION

and research institution. Why is UCSD's strength in graduate teaching and research of importance to undergraduates? The answer is at once simple and profound: UCSD faculty and scholars are continually involved in an impressive variety of research and developmental projects which puts this campus on the cutting edge of science and technology, and in the forefront in 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 nationally famed 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-two men's and women's intercollegiate athletic teams. Campus athletic facilities include 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.

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 been developed without the encumbrances of tradition. Increasing numbers of highly qualified students are being attracted to these innovative programs and by the opportunity to study with an outstanding faculty.

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 deliberately chosen to limit 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, 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 Computer Science and Engineering (CSE), or the Department of Electrical and Computer Engineering (ECE). All three 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 **pre-med** students, the common choices are biology, chemistry, psychology, and bioengineering (AMES). 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

DIVISION OF ENGINEERING

AMES (Applied Mechanics and Engineering Sciences)
CSE (Computer Science and Engineering)
ECE (Electrical and Computer Engineering)

HUMANITIES

History
Literature
Philosophy

SCIENCE AND MATHEMATICS

Biology
Chemistry
Mathematics
Physics

SOCIAL SCIENCE

Anthropology
Cognitive Science
Communication
Economics
Ethnic Studies
Linguistics
Political Science
Psychology
Sociology

DEPARTMENTAL UNDERGRADUATE MAJORS

ANTHROPOLOGY		ECONOMICS		PHILOSOPHY	
Anthropology	B.A.	Economics	B.A.	Philosophy	B.A.
Anthropology (Biological Anthropology)	B.A.	Quantitative Economics and Decision Sciences	B.A.	PHYSICS	
APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)		EDUCATION (see Footnote 1)		General Physics	B.A.
Aerospace Engineering	B.S.	ELECTRICAL AND COMPUTER ENGINEERING (ECE)		General Physics/Secondary Education	B.A.
Bioengineering	B.S.	Applied Physics	B.A.	Physics	B.S.
Bioengineering: Premedical	B.A./B.S.	Computer Engineering	B.S.	Physics/Biophysics	B.S.
Systems and Control Engineering	B.S.	Electrical Engineering	B.S.	Physics/Biophysics (Pre-medical)	B.S.
Chemical Engineering	B.S.	Engineering Physics	B.S.	Physics with Specialization in Earth Sciences	B.S.
Engineering Sciences	B.S.	Information Science	B.A.	POLITICAL SCIENCE	
Mechanical Engineering	B.S.	ENGINEERING (see AMES, CSE, and ECE)		Political Science	B.A.
Structural Engineering	B.S.	ENGLISH (see Literature)		PRELAW (see Footnote 2)	
BIOLOGY		ETHNIC STUDIES		PREMEDICAL (see Footnote 3)	
General Biology	B.S.	Ethnic Studies	B.A.	PSYCHOLOGY	
Animal Physiology and Neuroscience	B.S.	HISTORY		Psychology	B.A.
Biochemistry and Cell Biology	B.S.	History	B.A.	SOCIOLOGY	
Ecology, Behavior, and Evolution	B.S.	LINGUISTICS		Sociology	B.A.
Microbiology	B.S.	Linguistics	B.A.	TEACHER EDUCATION (see Footnote 1)	
Molecular Biology	B.S.	LITERATURE		THEATRE	
CHEMICAL ENGINEERING (see AMES)		Literatures in English	B.A.	Theatre	B.A.
CHEMISTRY		French Literature	B.A.	VISUAL ARTS	
Chemistry	B.A./B.S.	General Literature	B.A.	Art History/Criticism	B.A.
Chemistry/Biochemistry	B.A./B.S.	German Literature	B.A.	Media	B.A.
Chemistry/Chemical Education	B.S.	Italian Literature	B.A.	Studio	B.A.
Chemistry/Chemical Physics	B.S.	Russian Literature	B.A.	INTERDISCIPLINARY MAJORS (see Footnote 4)	
Chemistry/Earth Sciences	B.S.	Spanish Literature	B.A.	Chinese Studies	B.A.
Chemistry/Environmental Science	B.S.	Literature/Writing	B.A.	Classical Studies	B.A.
COGNITIVE SCIENCE		MATHEMATICS		College Special Individual Majors	B.A.
Cognitive Science	B.A./B.S.	Mathematics	B.A.	Earth Sciences	B.S.
COMMUNICATION		Applied Mathematics	B.A.	Italian Studies	B.A.
Communication	B.A.	Applied Mathematics (Scientific Programming)	B.A.	Judaic Studies	B.A.
COMPUTER SCIENCE AND ENGINEERING (CSE)		Mathematics—Computer Science	B.A.	Religious Studies	B.A.
Computer Science	B.A./B.S.	MUSIC		Russian and Soviet Studies	B.A.
Computer Engineering	B.S.	Music	B.A.	Third World Studies	B.A.
		Music/Humanities	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.

INTRODUCTION

SPECIAL DEPARTMENTAL EMPHASES

The following are some special departmental emphases that are of interest to a number of students.

- UCSD has three departments that offer both undergraduate and graduate degrees in *engineering*. Majors include aerospace engineering, applied physics, bioengineering, chemical engineering, computer engineering, electrical engineering, engineering physics, engineering science, information science, systems science, mechanical engineering, structural engineering, applied mechanics, applied ocean science, computer science, and communication theory and systems.
- An undergraduate major in biochemistry and cell biology is offered by the Department of Biology. An undergraduate major in chemistry/biochemistry is offered by the Department of Chemistry. These majors are described in the biology and chemistry sections of this catalog. Both the Department of Biology and the Department of Chemistry offer graduate programs with specialization in biochemistry.
- The Department of Visual Arts offers excellent programs in fine arts studio work, art history and criticism, and media and visual arts. However, UCSD offers no courses in commercial art.
- The Department of Psychology offers courses in all major areas of experimental psychology, with choices of experimental approaches. The department also offers a general psychology major but nothing in the fields of humanistic psychology or clinical psychology. A major in cognitive science is offered by the Department of Cognitive Science.
- The Teacher Education Program (TEP) offers a program of study leading to the preliminary and clear single subject and multiple subjects credentials. Graduates of this program are qualified for teaching positions in elementary and secondary schools.

SUMMER SESSION

UCSD offers a Summer Session consisting of a diverse range 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, offers expanded opportunities for international education, and gives students a chance to en-

joy courses featuring innovative formats or content, or taught by new or visiting faculty.

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 designed to meet the advanced educational needs of 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 of-

ferings 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.

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 semi-autonomous colleges.

Currently there are five colleges: Revelle, John Muir, Third, Earl Warren, and Fifth. 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 approximately 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 park-like, 1,200-acre site high on the bluffs overlooking the Pacific Ocean at La Jolla. Long famed as a vacation and retirement community, La Jolla boasts some of the finest beaches and coves, restaurants, 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.

For theater-lovers there are numerous theatres in San Diego, including the Old Globe Theater 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 Center 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, Third College Mountain View Lounge, and the Price Center.

MOUNTAINS, DESERTS, AND BEACHES

Many Southern Californians enjoy the out-of-doors year around. The San Diego metropolitan area—which includes the UCSD campus—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

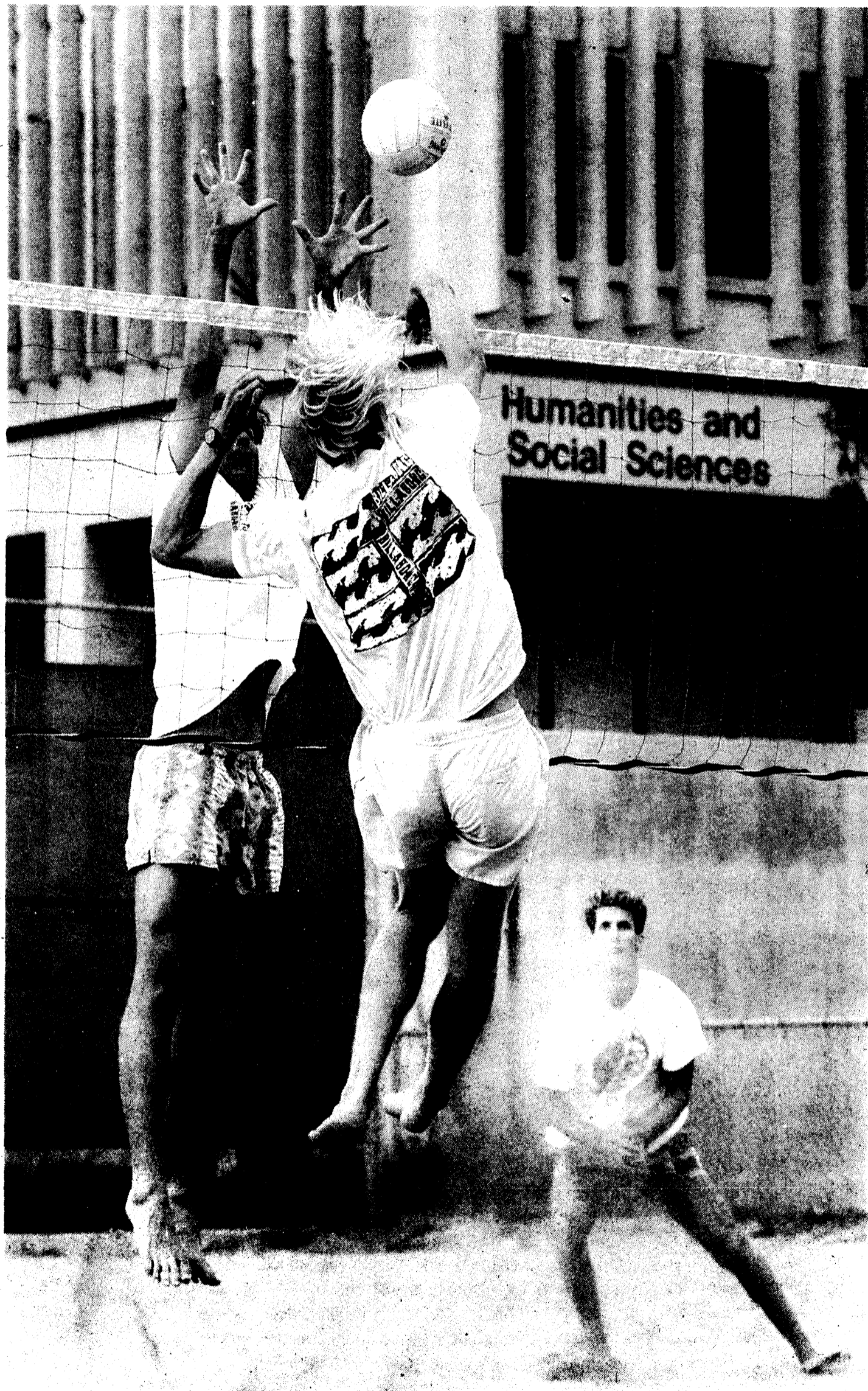
Through its intercollegiate athletic and intramural programs, UCSD provides its students with one of the more extensive and competitive sports programs in the United States. UCSD fields many intercollegiate athletic teams along with several club sports teams, while the intramural program provides for 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 51.
- What's the grading system at UCSD? See page 66.
- 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 95.
- 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.



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, Third, Earl Warren, and Fifth.

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, Third, Earl Warren, and Fifth—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. During the first two years at Revelle, a student spends roughly one-third of his or her class time in mathematics and the natural sciences and the other two-thirds in social sciences, humanities, foreign language, and the fine arts. These two years of structured liberal-arts courses help to establish a strong educational foundation. 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.

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 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.

THIRD COLLEGE EDUCATIONAL PHILOSOPHY

Third 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 are also required to complete courses in mathematics, natural/physical sciences, writing, humanities, and fine arts.

In addition to the strong academic program, Third 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.

WARREN COLLEGE EDUCATIONAL PHILOSOPHY

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 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. Consequently, all Warren 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.

FIFTH COLLEGE EDUCATIONAL PHILOSOPHY

Fifth 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, Russian or Japanese studies. To round out their general education, students complete two courses in math or computer science and two courses in natural sciences. All students in Fifth 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 Fifth 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 them attractive majors 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.")

Whatever the question or the problem, the provost and his or her staff stand ready at all times to help undergraduates in need of counsel.

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 who transfer to one of UCSD's five colleges from other institutions must complete the graduation requirements of the college of their choice. To determine which courses already completed by a student may be applied to his or her graduation requirements, the provost's academic advising office will evaluate the student's prior course record at the time of his or her initial enrollment in UCSD. Students may not receive units for courses which duplicate previous credits.

COLLEGE GENERAL- EDUCATION REQUIREMENTS

The general-education requirements of UCSD's five undergraduate colleges differ noticeably. In some cases, these requirements can significantly extend the time required to obtain a B.S. degree in engineering. Prospective engineering students should review the general-education requirements and take them into account when selecting a college.

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 required for new first-year students. Transfer students must consult college academic advisers to determine their specific general-education requirements. Each quarter most students normally carry four four-unit courses. Subjects are broadly classified as humanities, fine arts, social sciences, natural sciences, and mathematics. When a subject is listed as "noncontiguous," it must be in one of the categories which 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.

General Education

REVELLE COLLEGE

HUMANITIES 5
Includes two six-unit courses with intensive instruction in university-level writing. Written work is also required in the remaining three courses, each four-units

PHYSICS AND CHEMISTRY ... 4
A total of four courses with at least one course from each area

BIOLOGY 1

FOREIGN LANGUAGE 0-4
number of courses to attain proficiency

CALCULUS 3

SOCIAL SCIENCES 3
Three 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.

FINE ARTS 1
Art, music, theatre

MUIR COLLEGE

WRITING 2-3

A THREE-COURSE SEQUENCE 3
in SOCIAL SCIENCE

A THREE-COURSE SEQUENCE 3
in either

MATHEMATICAL SCIENCE
or

NATURAL SCIENCE

A THREE-COURSE SEQUENCE 6
in each of TWO of the following categories:

HUMANITIES
FINE ARTS
FOREIGN LANGUAGE

THIRD COLLEGE

"DIMENSIONS OF CULTURE" 3
(DIVERSITY, JUSTICE & IMAGINATION)

Includes two six-unit courses with intensive instruction in university-level writing

NATURAL SCIENCES 3
One course each in biology, chemistry, and physics

MATHEMATICS & LOGIC 2

HUMANITIES & CULTURE ... 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.

FINE ARTS 1

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

WARREN COLLEGE

WRITING 2

ETHICS and SOCIETY 1

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

PROGRAMS OF CONCENTRATION* 12
(for B.A./B.S. degrees in arts/sciences)

Two programs of concentration, each typically consisting of three lower-division and three upper-division courses. Both programs must be noncontiguous to the major and to each other.

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.

*One of these courses or one course in the major must be chosen from an approved list on cultural diversity.

FIFTH COLLEGE

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

FOREIGN LANGUAGE 2-3
One quarter may be waived for highly proficient students.

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

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

MATHEMATICS/COMPUTER SCIENCE 2

NATURAL SCIENCES 2

UPPER-DIVISION WRITING ... 1
At least one upper-division course in each student's program must include a significant writing component.

Minor

One required. Six courses focused in one noncontiguous subject area OR any six noncontiguous courses. At least three of these courses must be upper-division.

OPTIONAL

OPTIONAL

See "PROGRAMS OF CONCENTRATION" and "AREA STUDIES" in "General Education" section above.

OPTIONAL. Students may combine foreign language and regional specialization course work to create a minor focusing on a particular geographic area.

Major

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-two upper-division courses.

Total Number of Courses Required for Graduation

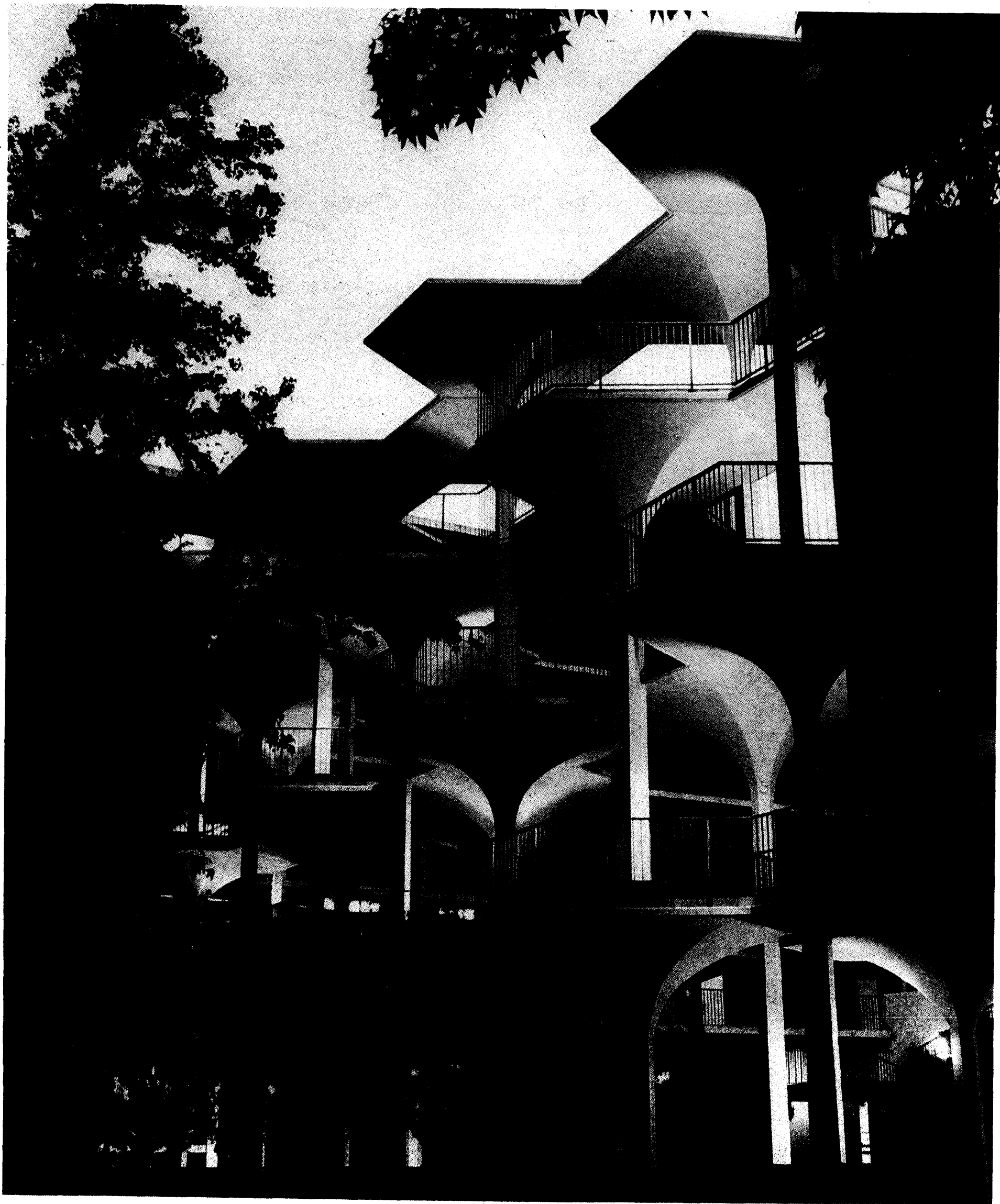
B.A./B.S. degrees require 46 courses (184 units) minimum.

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.



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.

Formerly called the School of Science and Engineering and later First College, Revelle College was established in 1958. After being temporarily housed on the Scripps campus, Revelle moved into its first complete buildings during the 1963-64 academic year. In 1960 Revelle began a graduate program in the physical sciences. From that beginning, it rapidly developed its humanities and social science programs, and today the teaching program reflects a broad spectrum of learning.

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. They will study a foreign language as a spoken, vital means of communication; studying that language, they will come to know something of the general nature of language itself. And they will study mathematics as part of general education and as preparation for required courses in the physical and biological sciences. They will learn more about their own culture in a two-year program of study in the humanities and fine arts, which requires the regular writing of essays. Finally, they will, as sophomores, study the social and behavioral sciences, including a course which focuses on the study of American ethnic groups and their interactions. Once they have completed this program, they will be ready for the relatively more specialized work of the upper division.

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.

The students' general education will not, however, stop at the end of the sophomore year; in addition to their majors, all upper-division students will do substantial work in an area or areas of learning distinctly different in content and method from that of the major. (Generally, the following will be considered "areas of learning" in the above sense: mathematics and natural sciences, the social sciences, humanities.)

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.

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 freshmen entering fall 1991 and later, and for transfer students entering fall 1994 and later, at least one of these courses must be from a list approved as meeting the requirement in American cultures.

5. MATHEMATICS

Mathematics has for centuries held an important place in education, in the sciences, and in the humanities. 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 junior and senior years in high school. Students who have completed college courses in calculus or who present advanced-placement credit in mathematics may not receive credit for mathematics courses which duplicate their advanced-standing work; however, they will be encouraged to further their study of higher mathematics. (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, Chemistry 6A-B-C, and Chemistry 7A-B. The Department of Physics offers three calculus-based sequences: Physics 1A-B-C, Physics 2A-B-C-D, and Physics 4A-B-C-D-E. 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.

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

The language requirement is normally satisfied well before the end of the student's second year at Revelle College. About a quarter of the students entering, after three or four years of a language in high school, satisfy the requirement by examination upon entrance. The option of satisfying the language requirement by examination is also available at the end of the third quarter of college-level language study for students who wish to take it. A placement examination is given in French, Spanish, German, and Russian. A language studied in high school for two or more years may be continued by placing into Linguistics 1B/1BX, 1C/1CX, and 1D/1DX or Literature 2A, and by passing Literature 2A or both Linguistics 1D

and 1DX with a grade of C — or better. Or a student may choose to begin the study of a new language and satisfy the requirement by taking Linguistics 1A/1AX, 1B/1BX, 1C/1CX, and 1D/1DX or Literature 2A, and passing Literature 2A or 1D/1DX with a grade of C — or better. Or a student may satisfy the requirement by passing (with a grade of C — or better) the fourth quarter of any modern or classical language course at UCSD. For any language, the fourth-quarter course must be taken at UCSD in order to satisfy the language requirement.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Foreign Language	Humanities 1	Humanities 2
Mathematics	Foreign Language	Foreign Language
Natural Science	Mathematics	Mathematics
Subject A or Fine Art	Natural Science	Natural Science
SOPHOMORE YEAR		
Natural Science	Natural Science	Fine Art 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, CSE, ECE, or math/computer science need to be aware of additional screening for acceptance into the major.



NONCONTIGUOUS MINOR

In addition to the major and the general-education requirements, Revelle College students are required to complete six courses in an area of studies *other than* that of the major. For the purposes of this requirement, the humanities, the social sciences, and the natural sciences (including mathematics) will be considered three different areas. At least three of the six courses must be at the upper-division level. It will be the student's responsibility to obtain assurance from the Office of the Revelle Provost that the courses which the student has chosen are noncontiguous. Courses used to satisfy general-education requirements may not be used again to fulfill a minor requirement; the minor comprises six courses distinct from those used on general-education or major requirements. During the junior year a student must specify how he or she will satisfy the minor requirement. (Forms are at the Office of the Revelle Provost.) Minor programs are subject to approval by the provost. The requirement may be met in one of the following ways:

1. *Department Minor*—All six noncontiguous 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 in the "center-of-gravity" department, who will also be available to assist the student in planning the program for the minor. (Students unable to locate an appropriate faculty adviser should ask the Office of the Revelle Provost for assistance.)

3. *Six Electives Unrelated to the Major*—Under this option, a student is free to elect any six courses for which he or she is qualified, subject only to the constraints that at least three courses be at the upper-division level and that all six courses are noncontiguous to the student's major.

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 minor may be taken on a Pass/Not Pass basis. (Please note: the Departments of Communication, Literature, Philosophy, Sociology, Linguistics, Mathematics, Music, Chinese Studies, Japanese Studies, and Theatre will not

approve courses taken Pass/Not Pass for a *departmental* minor.)

3. Courses taken as electives may be taken on a Pass/Not Pass basis.
4. Courses taken Pass/Not Pass may not be used in satisfaction of any lower-division Revelle College breadth requirements except fine arts and language.
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.
4. Complete six noncontiguous courses (at least three must be upper-division).
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 arts degree or the bachelor of science degree in biology, physics, cognitive science, chemistry, or in designated engineering programs.

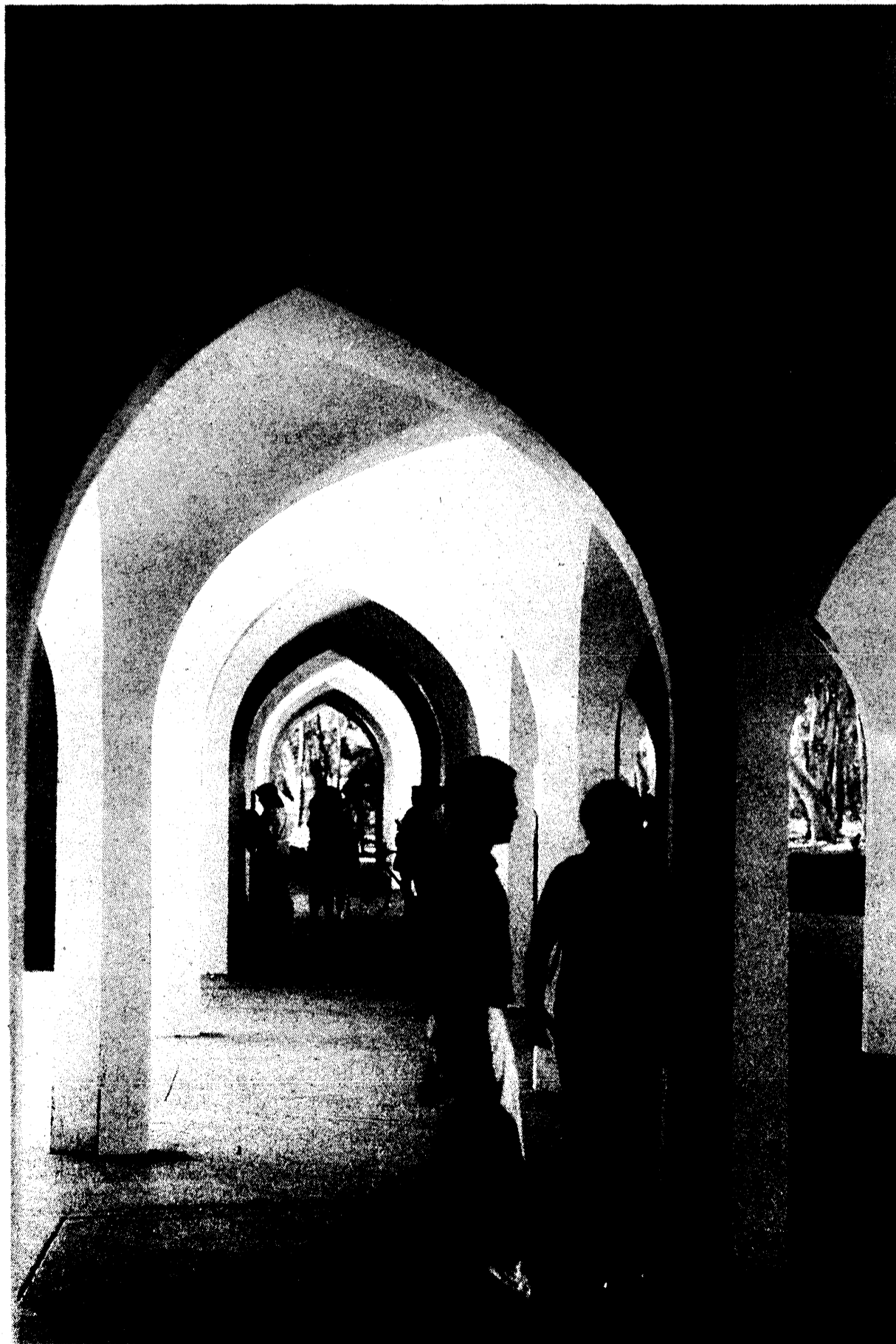
HONORS

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 four-

teen graded units during their first quarter. The program includes weekly participation in small faculty seminars, additional free computer time, guaranteed on-campus housing for four years, and a variety of other perquisites. Outstanding students are individually advised to join honors classes in chemistry, 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 fifteen UCSD students, the majority of them from Muir, 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 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. Effec-

tive fall quarter 1993 the general-education requirements include one course selected from an approved list that deals with the diversity of the society of the United States. As appropriate, this course may be substituted for one course in the social science, humanities, or fine arts sequence. 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:

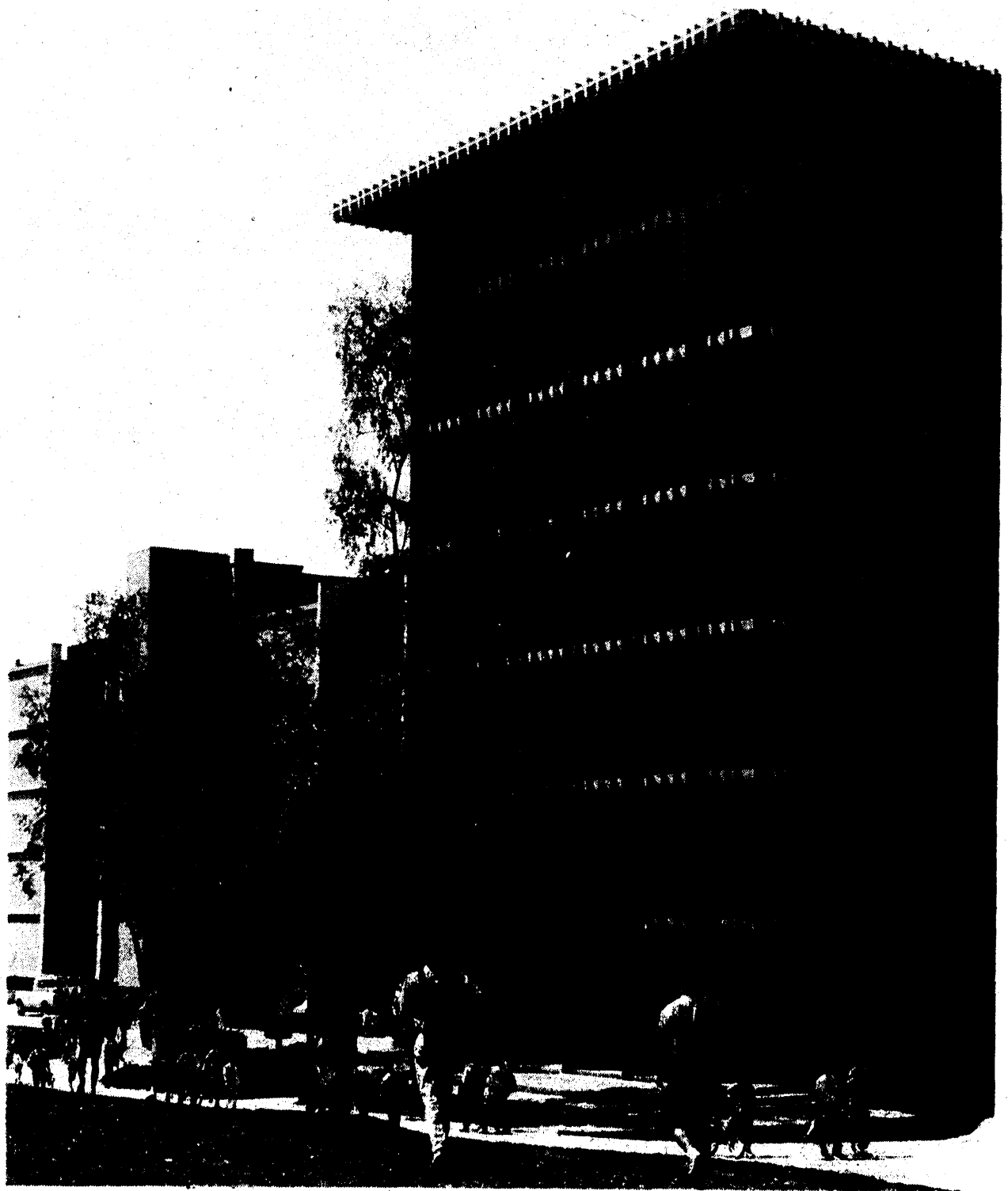
1. Students should request from the advising unit of the Office of the Provost a list of gen-

eral-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.



MUIR COLLEGE

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 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 (including P.E. courses). *A maximum of three units of physical education credit may be applied to the B.A. or B.S. degree.*

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 requires Physics 1A-B-C, Physics 2A-B-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, and Applied Mechanics and Engineering Sciences) together with certain social sciences (including economics), require at least one year of calculus.

The Muir Special Project major 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 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 ac-

quired. 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 form 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 second week of spring quarter.** Fees may be assessed if students miss these deadlines.
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. Complete required units. Students with B.A. degrees must pass forty-five four-unit (180 units) academic courses or their equivalent. Eighteen of the forty-five courses (72 units) must be upper-division level. Students with B.S. degrees in arts/science such as biology, chemistry, and physics or cognitive science may graduate with 180 units of which seventy-two are upper-division. Students with B.S. degrees in engineering must have at least 192 units with a minimum of eighteen upper-division four-unit courses.

7. 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, CSE, ECE, and Mathematics-computer science 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 complete 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 project. Each project must be approved by the provost. (See the section, "Major Programs and Special Projects," above.)

8. Satisfy the residency requirement which stipulates that nine of the last eleven courses 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 adviser for clarification.

9. 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 on "probation" or "subject to dismissal" in their last quarter will not be eligible for graduation.

10. *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.

11. 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. **Degrees are not automatically granted; students must file their intention to graduate.**

12. 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.

13. 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 (at least 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

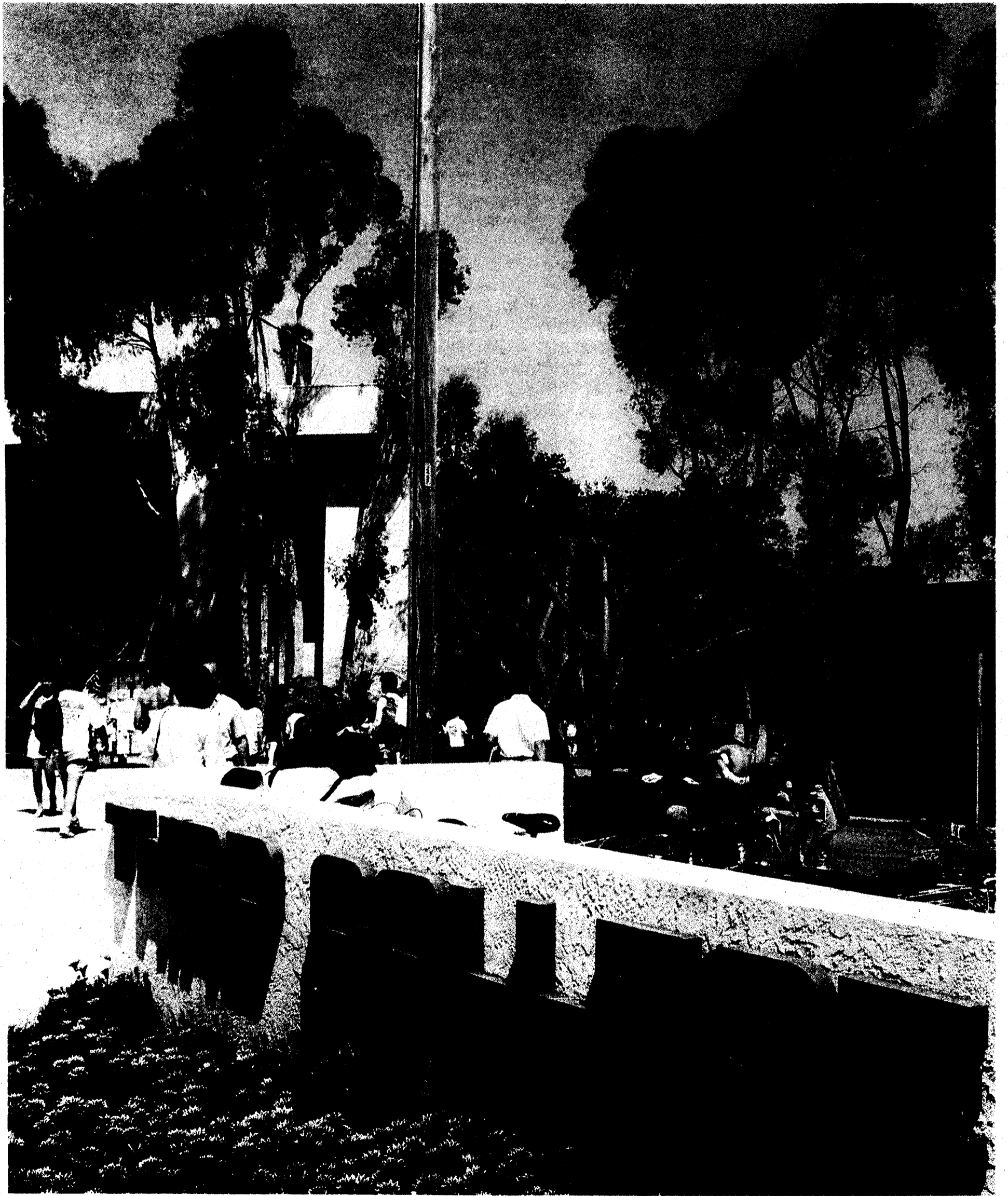
John L. Stewart, Founding Provost

*Earl Warren, Jurist and Statesman

*Robert Penn Warren, Poet and Novelist

Mandell Weiss, Philanthropist

*Deceased



Third College, founded in 1970, 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 primary goal and responsibility of the college is to provide its students with a rigorous academic curriculum. Third College has a rich tradition of sponsoring academic programs in comparative cultures, ethnic studies, urban studies and planning, science and technology, teacher education, communication, and Third World studies.

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 are also required to complete courses in mathematics, natural/physical sciences, writing, humanities, and fine arts.

In addition to the strong academic program, Third 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 community public service.

Throughout its history, Third College has been, and continues to be, educationally innovative. The first hands-on computer class at UCSD was sponsored by Third College. In the early 1970s, Third College initiated a science and technology program to invigorate the teaching of science to nonscience majors. Courses introduced by that program serve all UCSD students today. Among the UCSD colleges, Third College pioneered self-paced studies in mathematics and initiated the Academic Honors Program for first-year students

who are admitted with a GPA of 3.8 or better, and mathematics and verbal SAT scores of 650 or better in each area, and for entering transfer students with a GPA of 3.8 or higher.

Within such programs as Urban Studies and Planning and the Teacher Education Program, Third College pioneered field placement and internship programs to provide students opportunities to apply their knowledge to real world situations. In addition, Third College sponsors a number of activities which direct the intellectual resources of the university to matters of public importance and interest.

Third College provides a distinctive academic focus on social change and development in the modern world. The college poses such questions as: What should count as "progress"? How is it achieved? A full understanding of contemporary social problems typically requires a knowledge of their history, an appreciation of their cultural dimension, and analysis by means of the precise tools of the social and natural sciences. Third College is committed to the scholarly investigation of those factors which determine the quality of life in Western and non-Western countries.

College life outside the classroom and laboratory is a vital part of each student's undergraduate experience. Third College offers a variety of opportunities for students to shape the nature and character of student life at UCSD. Through active participation, Third College students develop maturity, self-confidence, and strong interpersonal, organizational, and leadership skills.

Third College's educational philosophy is founded on the belief that the best preparation for a complex, independent, and rapidly changing world is a broad liberal arts education, complemented by in-depth study in the areas of the students' choice based upon individual interests and career goals. This educational approach has several major advantages for students:

1. It guarantees a basic understanding of the principal branches of knowledge: the humanities and arts, social sciences, the natural sciences, and mathematics.
2. It enables students with well-defined major interests and career goals to begin work on their majors 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.

This educational philosophy finds further expression in the collegiate advising and counseling systems, which enable students to derive full benefit from the rich and diversified academic programs at UCSD.

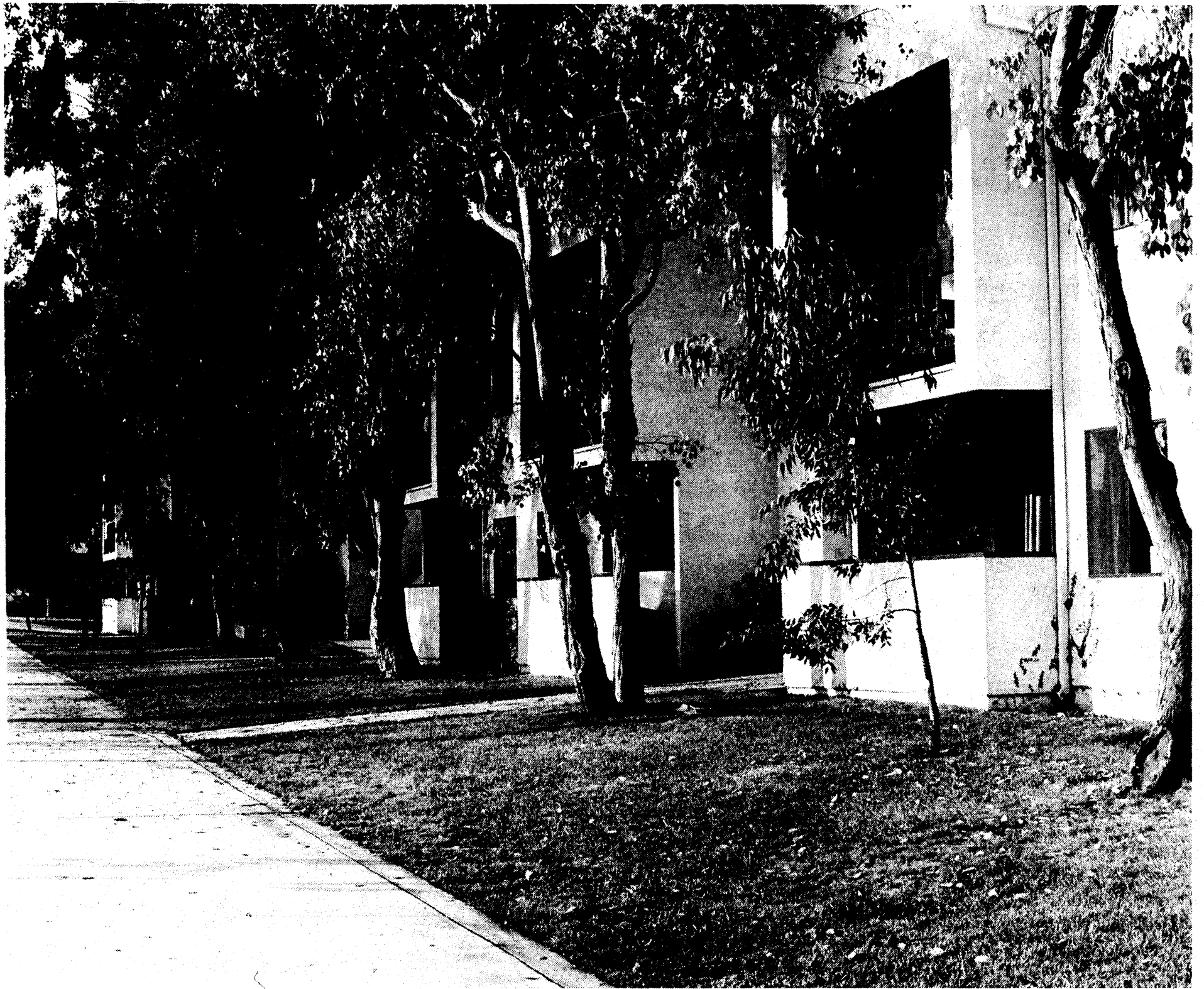
It is fundamental to the philosophy of Third College that students, faculty, and staff constitute an intellectual community joined in the task of mutual learning. This aspect of the college philosophy is reflected in the participation of students in faculty research projects, public service, student leadership, and the public affairs forums.

GENERAL-EDUCATION REQUIREMENTS

General-education requirements are established by Third College faculty. These requirements are designed to introduce students to the academic focus of Third 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 freshmen are as follows:

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 can be used to fulfill one course in Disciplinary Breadth.

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

GRADUATION REQUIREMENTS

To receive a bachelor's degree from Third 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 Third 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: Third 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 advisers and college counselors. For details on the specific major departments, refer to the "Courses, Curricula, and Programs of Instruction" section of this catalog.

Minors are optional at Third College. 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 Third 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, including physical education courses.

HONORS

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

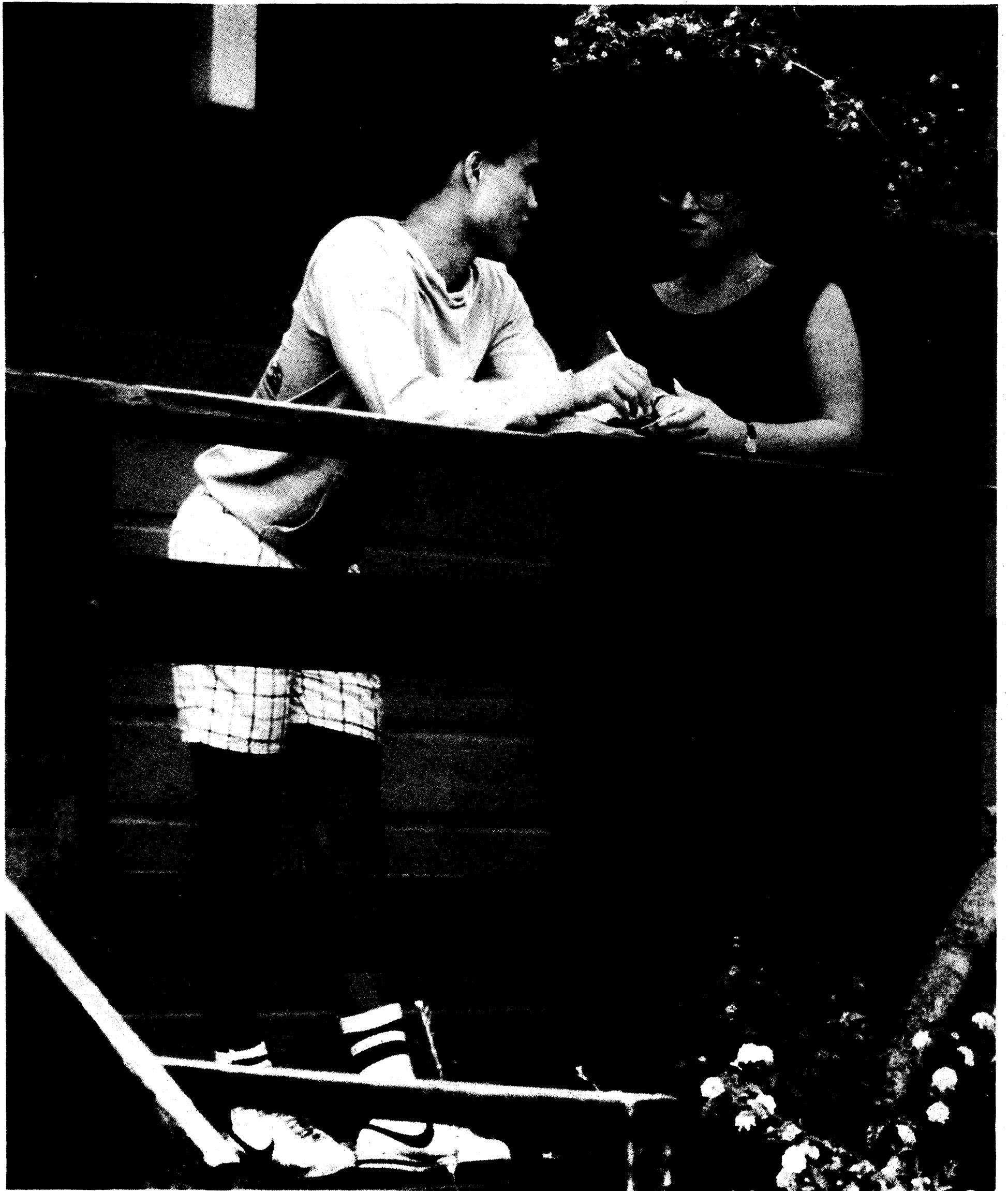
UCSD-MOREHOUSE/ SPELMAN STUDENT EXCHANGE PROGRAM

The UCSD-Morehouse/Spelman Student Exchange Program was established in the fall quarter of 1989. This formal exchange program was developed by Third 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 Third College Academic Advising for additional information.

HONORARY FELLOW OF THE COLLEGE

Ernesto Galarza, Novelist and Educator



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.

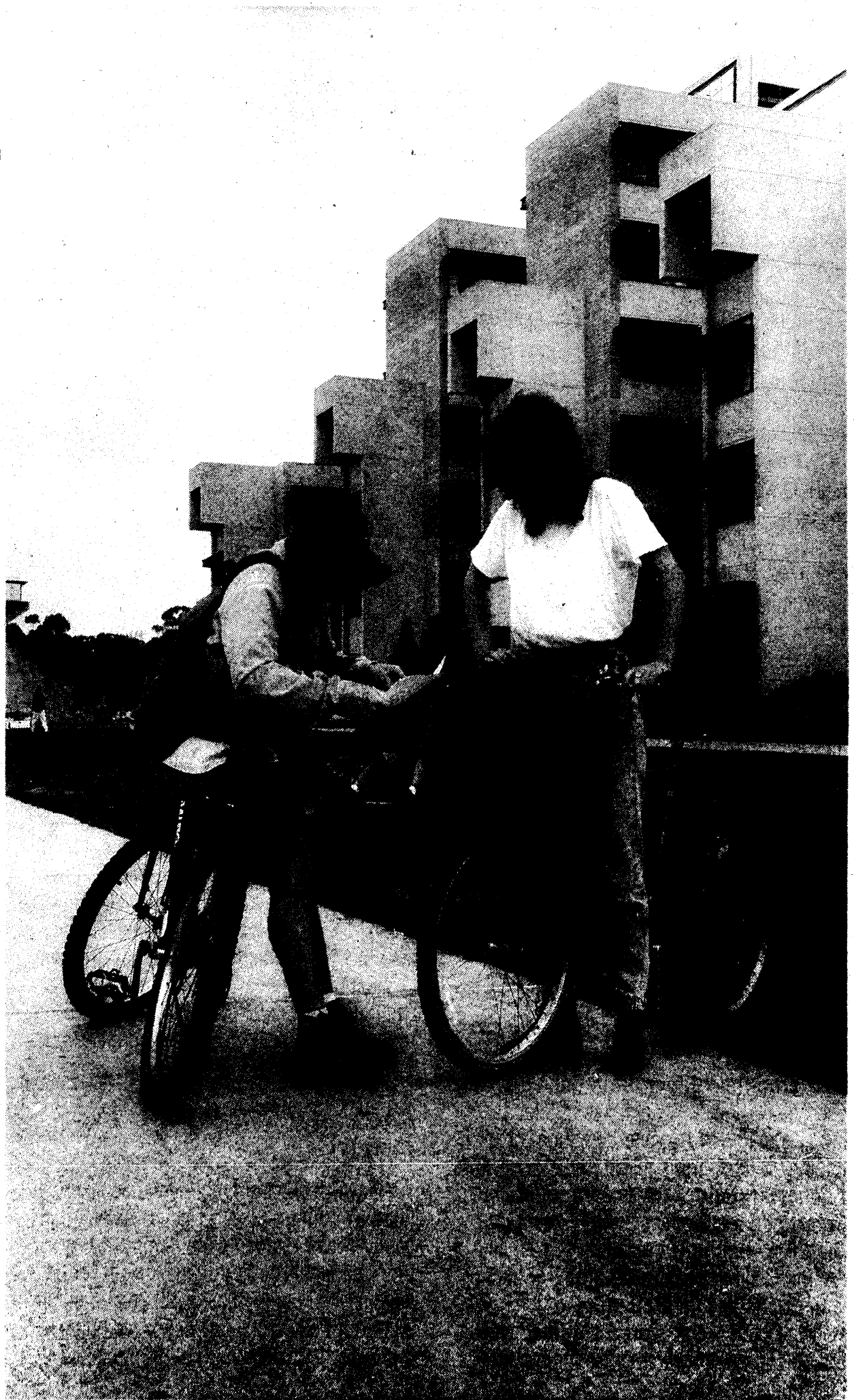
As governor during an era of lightning growth for California, he developed the State Department of Mental Hygiene, and led in reforms of the prison system in California by establishing the Board of Corrections and the Prisoner Rehabilitation Act. In his final role as a public servant, Mr. Warren was 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 predominantly 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 conviction that each student should have the oppor-



tunity to develop a program best suited to his or her individual interests, but 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. Warren College students 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 majors. For all students other than B.S. engineering majors, two **programs of concentration** of six courses each are required. These **programs of concentration** must cover the two disciplinary areas outside the student's major. With some exception, upper-division courses are required in the **programs of concentration**. 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 Warren College. A brochure entitled "Earl Warren College Programs of Concentration and Area Studies" will be provided to all Warren Students.

DOUBLE MAJORS

Double majors are required to include all three discipline areas in their academic plan. Thus, 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 the two remaining disciplinary areas.

PASS/NOT PASS GRADING OPTION

General-education requirements may be fulfilled by courses taken on the Pass/Not Pass basis. 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 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. One course in Cultural Diversity in U.S. Society to be chosen from an approved list.
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.

Students in good academic standing may be permitted to double major. Students must secure approval by petition from the appropriate departmental advisers and the college provost. Students must fulfill the requirements (prerequisites and upper-division courses) of both majors. Additional criteria established by the Academic Senate must also be met.

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.

THE WARREN COLLEGE SCHOLARS PROGRAM

The Warren College Scholars Program is an honors program for students with a broad range of interests and with a history of outstanding scholastic achievement. It offers the scholar an opportunity to work closely with the faculty throughout his or her academic career at UCSD. High school seniors with a 3.8 GPA and an SAT score of 650 in verbal and 650 in mathematics or above are automatically eligible for admission to the program. 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 na-

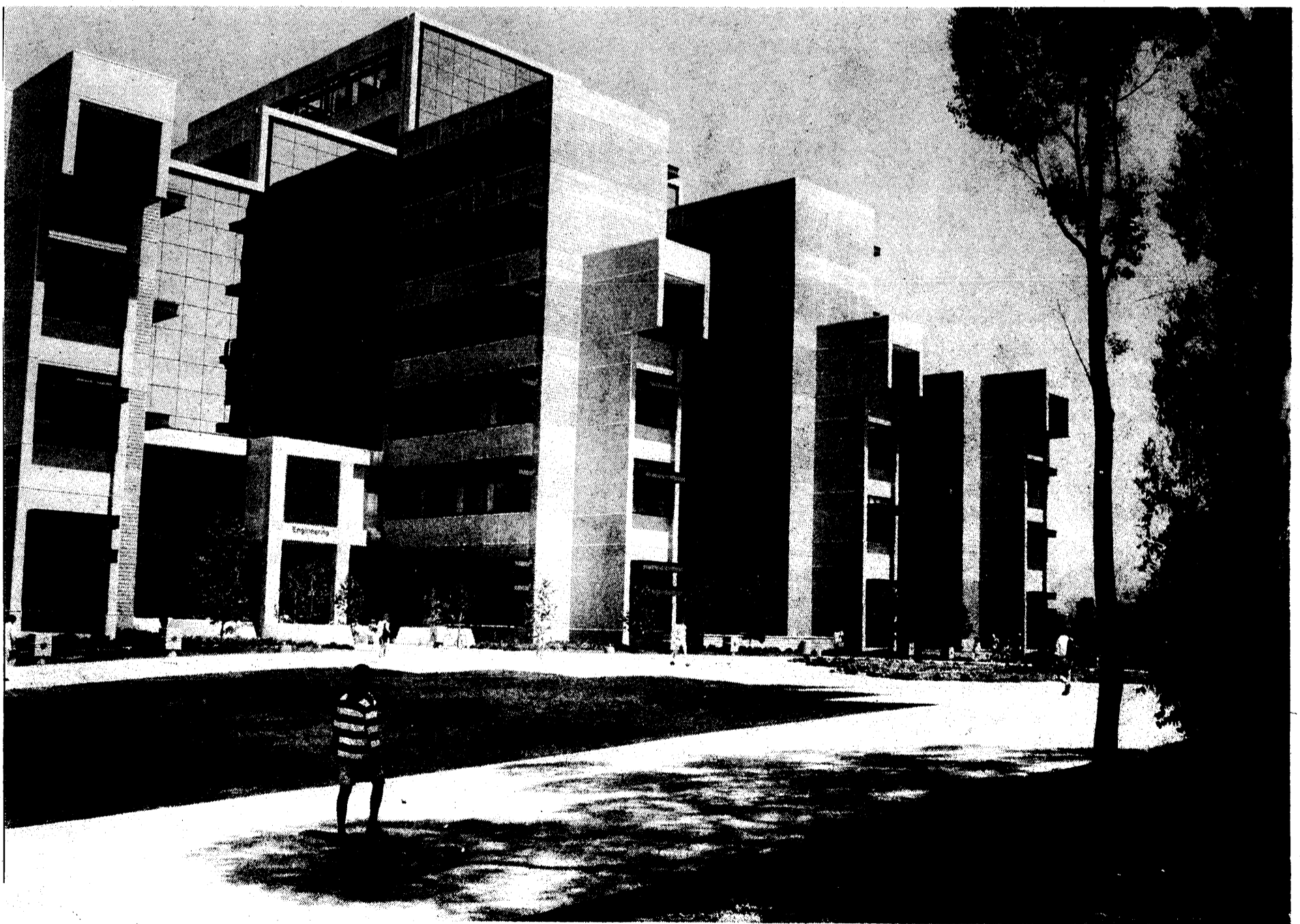
tional in scope and varied in offerings. Students might work for a senator in Washington; a legal-aid office in Los Angeles; a business, a T.V. station, research lab or social service agency in San Diego; or any number of other possibilities. Working closely with faculty advisers, students write research papers that integrate their academic backgrounds and internship experience. For more information, see listing under "Academic Internship."

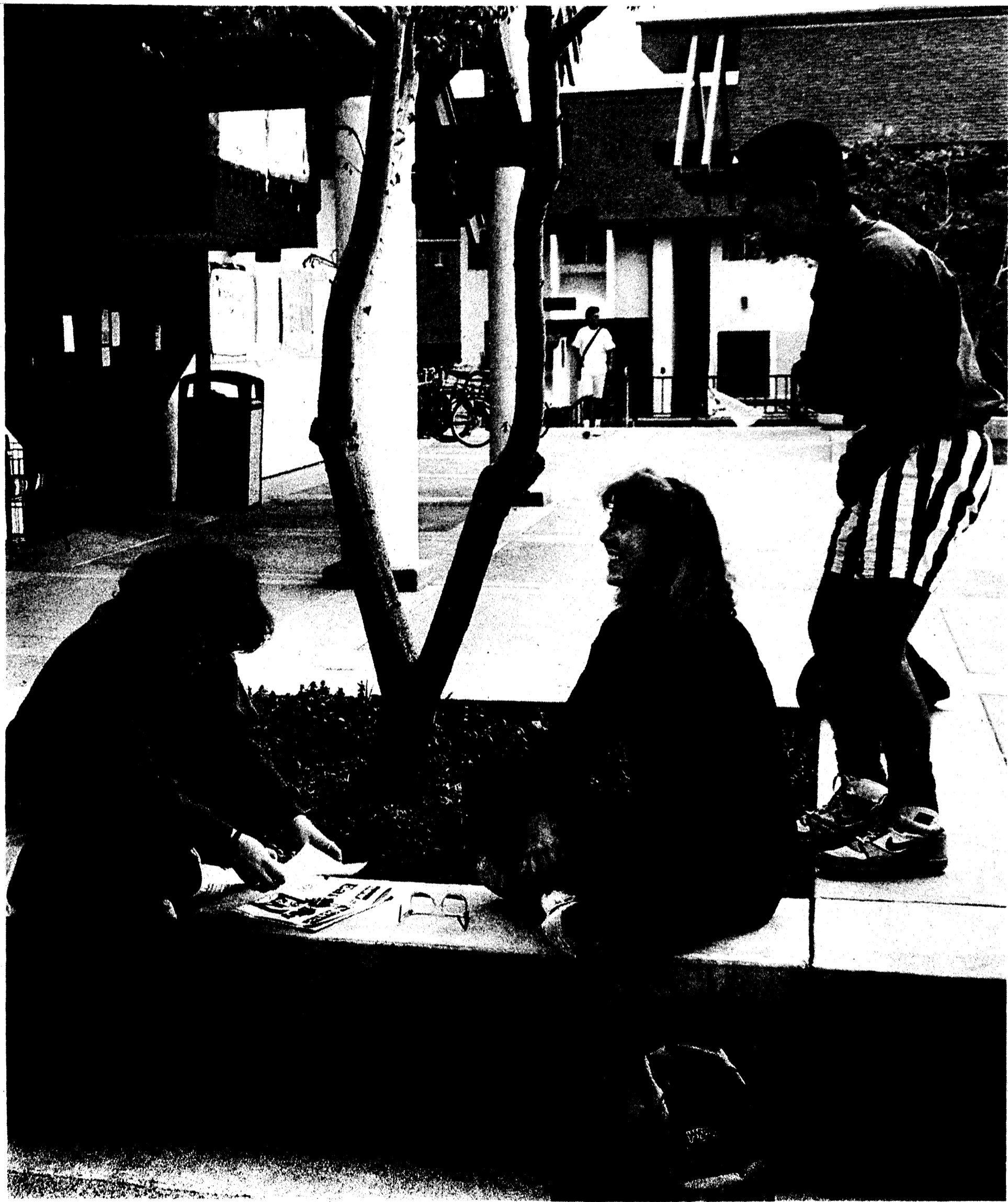
HONORS

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





FIFTH COLLEGE

Since its founding in 1988, Fifth College has established a reputation for the breadth and depth of the general education it offers and for strong sense of community and shared vision among its students, staff, and faculty. As the newest UCSD undergraduate college, Fifth has not yet reached steady-state enrollment and has room to grow.

The development of Fifth College was guided by the conviction that education for the twenty-first century must incorporate a world view and help students develop their abilities to function and communicate effectively in and across diverse cultures. The general-education curriculum includes basic studies in a range of disciplines and intellectual skills plus a strong background in comparative social and political systems and foreign language.

In the freshman and sophomore years, all students take "The Making of the Modern World," the college-unique six-course sequence which teaches them to think historically, cross-culturally, and across disciplines about an array of Western and non-Western cultures. The rationale behind the development of 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 Fifth student studies at least one foreign language. In the junior and senior years, in addition to concentrating on work in his or her major field, each student chooses a geographic area or an American ethnic subculture to study in depth.

Fifth College's international emphasis complements and enhances the substantive elements in 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, Fifth students are encouraged to spend part of their academic career in another country. In many cases, financial assistance can be obtained, and a variety of possibilities are available, including short-term or year-long academic pro-



grams, work-abroad opportunities, and career-related internships.

Fifth College is known for its strong sense of student community. Social activities and other opportunities to become involved reflect the interests and needs of both resident and commuter students. Programs range from dances to coffee houses, and from informal faculty lectures to international food festivals. A faculty member who lives in the Pepper Canyon apartment complex provides an opportunity for students who live on campus to interact with a professor on a more informal level than in the classroom. Students may participate in a wide variety of annual events and programs, such as concerts, barbecues, a semi-formal dance, leadership training opportunities, volunteer programs, the Multicultural Student Network, and many others. International House, a residential facility for upperclass and graduate international and American students, is also located on the Fifth College campus.

GENERAL-EDUCATION REQUIREMENTS

General-education requirements are established by the Fifth 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 Fifth 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. All courses in the sequence may be taken for a letter grade only. 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 the student's native language. 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 Fifth College Provost's Office for more information on this requirement.

4. Mathematics/Computer Science: Two courses to be chosen from offerings in pre-calculus, calculus, statistics, symbolic logic, and computer sciences. Consult the Provost's Office for a list of acceptable courses.

5. Natural Sciences: Two courses to be chosen from those offered by the Departments of Biology, Chemistry, Physics, and/or Earth Sciences.

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 Fifth 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.)

7. Upper-Division Writing: At least one upper-division course in each student's program must include a significant writing component (3,000 words or twelve to fifteen double-spaced pages). Courses used to meet the upper-division writing requirement may also be used to meet other general-education, major, or graduation requirements. Consult the Provost's Office for more information on this requirement.



MODEL PROGRAM

FALL	WINTER	SPRING
FRESHMAN YEAR		
Making/Modern World 1	Making/Modern World 2	Making/Modern World 3
foreign language	foreign language	foreign language
math/computer	math/computer	elective
science	science	fine arts
Subject A or elective	fine arts	
SOPHOMORE 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)		
upper-division writing requirement (one course, which may also be applied to another requirement)		
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

A Fifth 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 Fifth 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 in it a grade of C- or better. Further information may be obtained from the Fifth College Academic Advising Office.

MINORS

Although no minor is required for Fifth College students, completion of a minor can be a significant educational or pre-professional 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, Russian or Japanese 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. Fifth 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 academic adviser in the Provost's Office as early as possible. Minors will be noted on the student's transcript at graduation.

GRADUATION REQUIREMENTS

To receive a bachelor's degree from Fifth 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 Fifth 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. All courses that meet Fifth College general-education requirements in the following areas may be taken on a P/NP basis: fine arts, natural science, math/computer science, and the lower-division regional specialization course. All others 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

All Fifth College students are strongly encouraged to study or to complete a career-related internship in another country. 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 Fifth College Provost's Office during the freshman or early sophomore year to initiate planning for study or work abroad.

HONORS

Particularly well-prepared students are invited to join a first-year honors program. In the fall-quarter seminar students meet with a different member of the faculty each week. In winter and spring quarters a single faculty or series of faculty explores with students a topic that has international dimensions.

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

Students who earn provost's honors for a full academic year by maintaining a GPA of 3.5 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 PROCEDURES

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

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.

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
Student Outreach and Recruitment, 0337
9500 Gilman Drive
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 admission 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 aptitude test scores from either the American College Test (ACT), or the Scholastic Aptitude Test (SAT). Additionally, scores must be reported from three College Board Achievement Tests (ACH), including one each in English composition, 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 all colleges you have at-

UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

tended. Have them sent directly to the UCSD Office of Admissions.

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 Student Outreach and Recruitment. For additional information about EOP or SAA eligibility requirements, program services, or general information regarding UCSD, call or write:

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

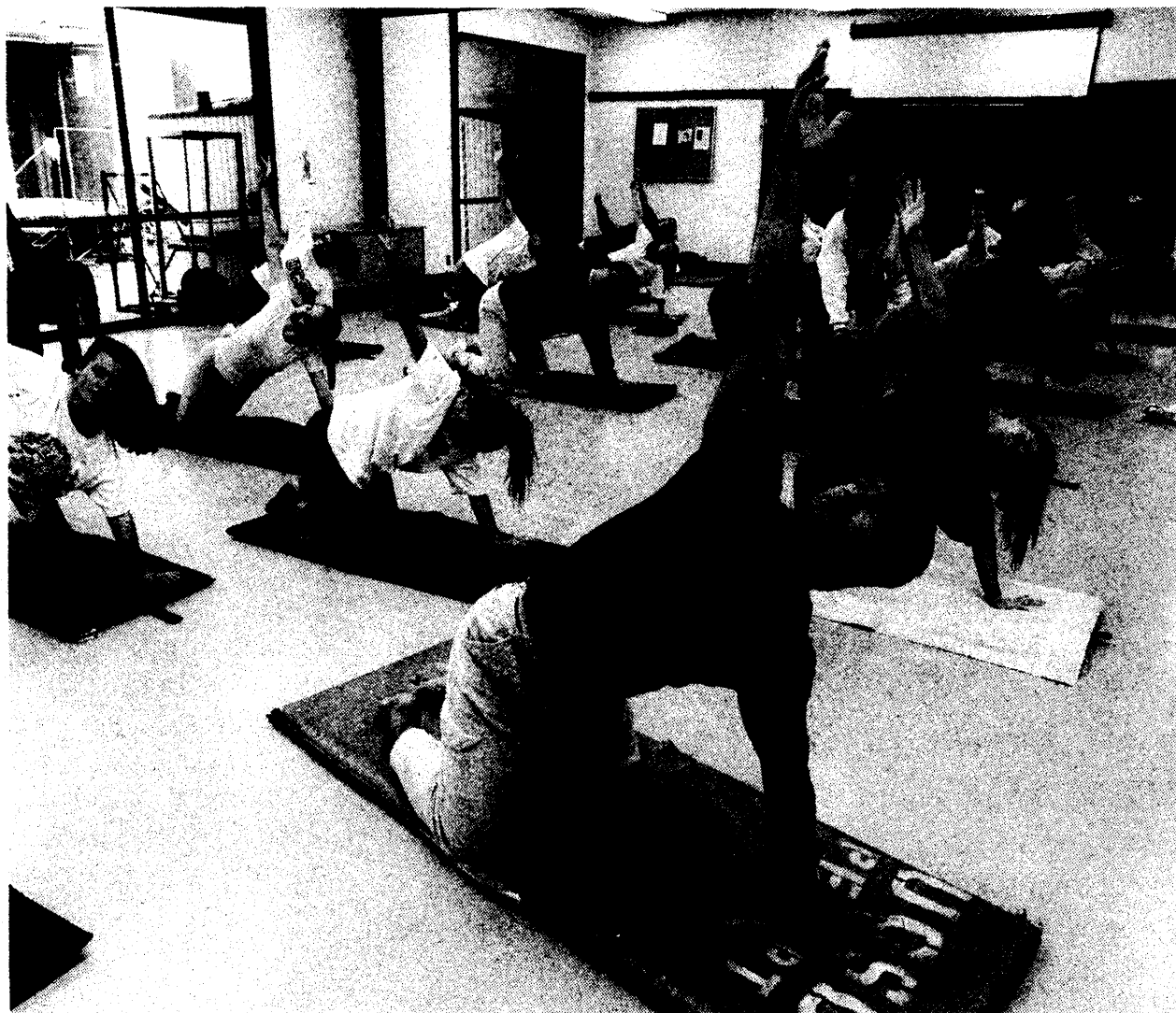
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UNDERGRADUATE COLLEGES AND MAJORS

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, Muir, Third, Warren, or Fifth). You *must* indicate a second or third choice in the event your first choice college closes early. Applicants may be reassigned to another college by the Admissions Office 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.

Although you may be accepted to the college of your choice, 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 ex-



plained in detail under the department listing in this catalog.

As of the printing of this catalog the Departments of Applied Mechanics and Engineering Sciences, Computer Science and Engineering, and Electrical and Computer Engineering 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. 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 aptitude 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 mathematics, laboratory sciences, and foreign languages. High test scores are necessary in conjunction with strong per-

formance 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 cultural, racial, geographic, and socioeconomic backgrounds characteristic 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 Scholastic Aptitude Test or the American College Test, and the College Board Achievement 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 and bonus points will be 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 sixty transferable semester-units (ninety 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 sixty transferable units completed one term prior to entrance and a GPA of 2.80 or better; Inter-campus Transfers (ICTs) with sixty transferable units (ninety quarter) completed one term prior to entrance; California residents attending public or private four-year institutions (in or out of state) with sixty transferable units completed one term prior to entrance; and non-California residents attending public or private four-year institutions with sixty 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. (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 and defined below. Also, at least seven of the fifteen units must have been earned in courses taken during the last two years of high school.

Specific "a-f" Course Requirements

a. History: 1 unit

One year of United States history, *or* one-half year of United States history and one-half year of civics or American government, 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 algebra, 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: 1 unit

A year course in one laboratory science, taken in the tenth grade or later.

e. Foreign Language: 2 units

Two years of one foreign language 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: 4 units

Four units in addition to those required in a. through e. above, to be chosen from at least two of the following subject areas: history, En-

UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

English, advanced mathematics, laboratory science,* foreign 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.)

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.

* A general science course taken in the ninth grade as preparation for a laboratory science course is an acceptable elective. However, the course cannot be used to satisfy the "d" requirement.

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

Foreign Language Elective courses may be in either the same language used to satisfy the "e" requirement or in a second foreign 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, for students graduating from high school in 1984 or thereafter, the grades in up to four units of eleventh and twelfth grade honors courses will be counted on a scale A = 5, B = 4, C = 3, if these courses are certified by the high school and the University of California as offered at an honors level. Honors credit will also be given for up to two of these four units taken in tenth grade.

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 aptitude test, either a or b:

a. Scholastic Aptitude Test (SAT)
Your verbal and mathematics scores on this test must be from the same sitting.

ELIGIBILITY INDEX

A-F GPA	ACT ¹ COMPOSITE	OR	SAT ² TOTAL	A-F ² GPA	ACT ¹ COMPOSITE	OR	SAT ² TOTAL
2.82	36		1590	3.06	25		1030
2.83	36		1570	3.07	24		1010
2.84	35		1540	3.08	23		980
2.85	35		1520	3.09	23		960
2.86	35		1500	3.10	22		940
2.87	34		1470	3.11	22		910
2.88	34		1450	3.12	21		890
2.89	33		1430	3.13	21		870
2.90	33		1400	3.14	20		840
2.91	33		1380	3.15	20		820
2.92	32		1360	3.16	19		800
2.93	31		1330	3.17	19		770
2.94	31		1310	3.18	18		750
2.95	31		1290	3.19	18		730
2.96	30		1260	3.20	17		700
2.97	30		1240	3.21	17		680
2.98	29		1220	3.22	16		660
2.99	28		1190	3.23	16		630
3.00	28		1170	3.24	15		610
3.01	27		1150	3.25	15		590
3.02	27		1120	3.26	14		560
3.03	26		1100	3.27	14		540
3.04	26		1080	3.28	13		520
3.05	25		1050	3.29	12		490

¹ACT is scored in intervals of 1 point, from a minimum of 1 to a maximum of 36.

²SAT is scored in intervals of 10 points, from a minimum of 400 to a maximum of 1600.

- b. American College Test (ACT)
The composite score will be reported.
2. Three College Board Achievement Tests (ACH)

These must include (a) English Composition;* (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 test is a total score of the math and verbal taken at the same sitting. See your counselor for information and registration forms or write to the College Entrance Examination Board (SAT), P.O. Box 1025, Berkeley, California 94701. For ACT information, write to the ACT Program, P.O. Box 168, Iowa City, Iowa 52243. You should 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 \$40 fee.

FRESHMAN ELIGIBILITY

CALIFORNIA RESIDENTS MINIMUM REQUIREMENTS

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

Please be advised that these are minimum eligibility requirements. The San Diego campus has been unable to accommodate all 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 (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 following 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 total or your ACT composite, the table will show the required GPA.

*The Achievement Test in literature may not be substituted.

Eligibility by Examination Alone: If you do not meet the scholarship and subject requirements for admission, you can qualify for eligibility as a freshman by examination alone. To do so, you must earn 1300 on the SAT or 31 on the ACT. Your total score on the three Achievement Tests must be 1650 or higher with no area score less than 500.

Applicants who have completed fewer than twelve transferable college units since graduation may qualify for admission by examination alone. (Note: if you have completed transferable college courses, CEEB Achievement tests cannot be taken in academic subjects covered in those courses.) Note: This option can be considered only when the number of applications received can be accommodated.

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.)

Eligibility by Examination Alone: If you do not meet the scholarship and subject requirements for admission, you can be considered for admission as a freshman by examination alone. To do so you must earn 1300 on the SAT or 31 on the ACT. Your total score on the three Achievement Tests must be 1730 or higher with no area score less than 500.

Applicants who have completed fewer than twelve transferable college units since graduation may qualify for admission by examination alone. (Note: if you have completed transferable college courses, CEEB Achievement tests cannot be taken in academic subjects covered by those courses.)

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 foreign language,

two to three years of laboratory science, one year of history, 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.

For more detailed information on recommended high school courses, ask your counselor to show you a copy of the university-wide publication *Prerequisites and Recommended Subjects*.

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. 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 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.

Counselors should be aware that the College Board reports all AP test results to the university. Students may not choose which test scores they wish reported. 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
<i>(8 unit maximum for both tests)</i>	
Art History	8
Biology	8
Chemistry	8
Classics	
Latin: Virgil	4
Latin: Catullus/Horace	4
Computer Science	
Computer Science A	2
Computer Science AB	4
<i>(4 unit maximum for both tests)</i>	
Economics	
Microeconomics	4
Macroeconomics	4
English	
Composition and Literature	8
Language and Composition	8
<i>(8 unit maximum for both tests)</i>	

Foreign Language	
French Language	8
French Literature	8
German Language	8
German Literature	8
Spanish Language	8
Spanish Literature	8
Government and Politics	
American	4
Comparative	4
History	
American	8
European	8
Mathematics	
Calculus AB	4
Calculus BC	8
<i>(8 unit maximum for both tests)</i>	
Music	
Listening and Literature	8
Theory	8
<i>(8 unit maximum for both tests)</i>	
Physics	
Physics B	8
Physics C1 (Mechanics)	4
Physics C2 (Electricity and Magnetism)	4
<i>(8 unit maximum for three tests)</i>	
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 credit. Space does not permit a full discussion of how AP credit is granted for each major, so students should be advised to check with the major department. The campus Office of Admissions can advise counselors and students about these issues.

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:
 - 1. 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 require-

ments 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 or statistics for which advanced algebra is a prerequisite. All of the other courses described above must be transferable to the university.

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 are considered for admission unless additional standards are met. Priority is given to students transferring from 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.

ADVANCED PLACEMENT CREDIT: APPLICATION TO COLLEGE AND MAJOR REQUIREMENTS

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 minor or may be used as 8 units of elective credit.
Art—History 8	None.	Fulfills fine arts requirement or 2 courses of the noncontiguous minor or may be used as 8 units of elective credit.
Biology 8	Score of 4 or 5 = 8 units credit and 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.	Score of 3, 4, or 5 meets Revelle biology requirement even though Biol. 10 does not.
Chemistry 8	Score of 3 = 8 units credit and exempt Chem. 4 or 11. Score of 4 = 8 units credit and exempt Chem. 11, 12 or Chem. 6A and may take Chem. 7A for credit. Score of 5 = 8 units credit and exempt. Chem. 6A, 6B, 6C or Chem. 7A, 7B.	Partial completion of natural science requirement.
Classics • Latin: Virgil 4 • Latin: Catullus/Horace 4	Score of 3, 4, or 5 = 4–8 units of elective credit or 1–2 quarters of college Latin. (See Lit/La 2 professor.)	Usually prepares student to pass proficiency exam: 2 courses of the noncontiguous minor or may be used as 8 units of elective credit.
Computer Science • Computer Science A 2 • Computer Science AB 4 (4-unit maximum for both tests)	Score of 5 only on AB exam equivalent to CSE 65. Score of 3 or 4 on A or AB exam = elective units.	1 course on noncontiguous minor.
Economics • Microeconomics 4 • Macroeconomics 4	Score of 5 AP micro (AP macro) = exempt Econ. 1A/2A (1B/2B). Score of 3 or 4 = elective units. Majors/minors exempt 1A/2A or 1B/2B only with score of 5.	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 minor or 8 units of elective credit.
Foreign Language • French 8 • German 8 • Spanish 8 Foreign Literature • French 8 • Spanish 8	Score of 3 = exempt Linguistics 1C/1CX. Score of 4 = exempt Linguistics 1D/1DX or Literature 2A. Score of 5 = exempt Literature 2B. Score of 3 = exempt Linguistics 1D/1DX or Literature 2A. Score of 4 = exempt Literature 2B. Score of 5 = exempt Span. Literature 2C or French Literature 50.	Prepares student to pass proficiency exam.
Government and Politics • American 4	Score of 3, 4, or 5 satisfies American history and institutions requirement. Score of 3, 4, or 5 = exempt Poli. Sci. 10.	1 course toward social science requirement or 1 course of noncontiguous minor.
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 minor.
History • American 8	Score of 3, 4, or 5 = exempt History: HILD 2A-2B. Satisfies American history and institutions requirement.	2 courses toward social science requirement or 2 courses of noncontiguous minor.
History • European 8	Score of 3, 4, or 5 = exempt History HILD 3A-3B	2 courses of the noncontiguous minor.
Mathematics • Calculus AB 4 • Calculus BC 8 (8-unit maximum for both tests)	Score of 3, 4, or 5 AB exam, 4 units = exempt Math. 2A. BC exam, 8 units = exempt Math. 2A, 2B.	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 minor.
Physics • Physics B 8 • Physics C Mechanics 4 • Physics C Electricity and Magnetism 4 (8-unit maximum for all three tests)	B exam = 8 units of elective credit and exempt Physics 10. C exam (Mech.) score of 3 or 4 = 4 units credit and exempt Physics 1A and may take Physics 2A or 4A for credit; score of 5 = 4 units credit and exempt Physics 2A and may take Physics 4A for credit. C exam (E&M) score of 3 or 4 = 4 units credit and exempt Physics 1B and may take Physics 2B or 4B for credit; score of 5 = 4 units credit and exempt Physics 2B and may take Physics 4B for credit.	Each 4 units on C exam (Mech. or E&M) can meet 1 course of the natural science requirement.
Psychology 4	None	1 course toward social science requirement or 1 course of noncontiguous minor.

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 student, nor are they required to graduate earlier.

MUIR COLLEGE	THIRD COLLEGE	WARREN COLLEGE	FIFTH 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.	8 units of elective credit.	8 units of elective credit.	8 units of elective credit.
Score of 3 meets one course of natural science option; score of 4 or 5 meets two courses of natural science option.	Score of 3, 4, or 5 meets 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.	Meets 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.
Meets 1 to 2 courses of foreign language option.	May apply 1 to 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.
2-4 units elective credit.	AB exam = 1 course toward computing component of mathematics and logic requirement or 1 course toward disciplinary breadth if noncontiguous to major.	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.	Each score of 3, 4, or 5 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.	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; exempt 2 courses of the language option 1B/1BX, 1C/1CX.	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 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.
1 course toward social science requirement.	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.
Meets 2 courses of 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.
Meets 2 courses of 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.	1 course may apply toward regional specialization. See Fifth 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 logic requirement. If BC exam may apply 2 courses toward math. and logic 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.
2 courses of fine arts option	1 course toward fine arts requirement and 1 course toward the disciplinary breadth requirement if noncontiguous 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 natural science 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.
1 course toward social science requirement.	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.

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 a grade of C or better, in high school 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*
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.

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. Only the grade earned in the repeated course will be included in the grade-point average.

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. Applications from students who appear to have more than 135 quarter-units (90 semester-units) of transfer credit will be reviewed for approval by the UCSD college to which they applied.

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 (70-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) transferability of units is decided by the system-wide administration of the University of California, and these decisions are binding upon all UC campuses; (2) applicability of transferred units to breadth (general-education) requirements is decided for each UCSD college by its provost (see also "Transfer Agreements" below); (3) applicability of units toward the major is decided by the appropriate UCSD department. Before applying to UCSD you may obtain more information on many of these matters from the Student Outreach and Recruitment Office.

Applicants who have completed courses at a postsecondary institution outside the U.S.A. should contact an admission evaluator in the Office of Admissions. 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

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./9-11 qtr.-units
Physical and Biological Sciences:	One course in each area, at least one must include a laboratory, two courses, 7-9 sem./9-11 qtr.-units
Language Other than English:	Proficiency equivalent to two years' high school study ^b

^aFor transfer to UC, a course in oral communication is not required.

^bStudents transferring to CSU do not have to meet this requirement.

agreements are admitted to Warren, Third, or Muir College only.

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 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, P.O. Box 899, Princeton, New Jersey 08540. 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 transpor-

tation 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.

SECOND BACCALAUREATE/ AND LIMITED STATUS APPLICANTS

Applications received by the Office of Admissions 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 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.

Applicants should check with the Undergraduate Admissions Office for a list of colleges that are open to those seeking a second baccalaureate or limited status.

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.

HOW TO APPLY FOR ADMISSION

Undergraduate admissions application packets are available from California high

school and community college counselors or from any UC campus admissions office. A special application is available for international students. Complete the Undergraduate Application form in this packet. Follow the accompanying directions carefully and mail to: University of California, 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).

Each campus of the university accepts for consideration all applications it receives during this period. 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 1993:
File November 1-30, 1992**

**Winter Quarter 1994:
File July 1-31, 1993**

**Spring Quarter 1994:
File October 1-31, 1993**

UC Berkeley Only

**Fall Semester 1993:
File November 1-30, 1992**

**Spring Semester 1994:
File July 1-31, 1993**

NOTE: Some campuses do not accept applications for winter and spring. Inquire at the campus Admission Office.

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 Admissions Office 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 Student Outreach and Recruitment offices 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 (Muir, Revelle, Third, Warren, or Fifth) 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 Admissions Office 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.

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, transfer credit may be granted upon receipt of the college transcript.

If you are applying for admission as a transfer student, the Office of Admissions requires official transcripts from your high school of graduation, from each college you have attended, and a preliminary transcript from your present college, with not more than one term still to be completed, 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 a UCSD college in order of preference. Be sure to sign the form.
2. Complete your personal essay and include with the application.
3. Freshmen: Fill in the self-reported academic data and test information carefully and accurately.

Transfers: You must fill in the self-reported academic record as instructed in the Undergraduate Application packet.

4. Mail application during the filing periods with fee (check or money order payable to The Regents of the University of California) to:
University of California
P.O. Box 23460
Oakland, CA 94623-0460

5. Arrange to take the ACT or SAT test and CEEB Achievement 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. Final high school transcripts must be on file in the UCSD Office of Admissions by July 12.

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 15. All offers of admission are provisional until the receipt and verification of your official final high school transcript. If you are offered admission based on your self-reported academic record, your official high school transcript will be used to verify the self-reported academic data you submit. Offers of admissions may be rescinded if there are discrepancies between your official high school transcript and your self-reported academic record; you do not complete the courses listed as "in progress" or "planned" in your twelfth grade; 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 academic record; you do not complete the courses listed as "in progress" or "planned;" the specified GPA is not maintained in courses "in progress" or "planned."

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 transcripts.

After receipt of notification of admission:

1. Read your admit letter carefully, noting any special provision governing your admission.

2. Request that any outstanding transcripts be forwarded to the Office of Admissions to ensure full matriculation.
3. Complete and return to the Office of Admissions 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. Your admission status may be in jeopardy if the stated deadline is not met. 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 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 \$12,000 for California residents living away from home.

It is possible to live simply and to participate moderately in the life of the student community on a limited budget. The 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.

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*	\$ 231	\$ 231	\$ 231	\$ 693
Educational Fee	862	862	862	2,586
Temporary General Fee	50	50	50	150
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	12	12	12	36
Board and Room in Residence Halls (Avg.)	2,137	2,137	2,137	6,411
Transportation (Approx.)	206	206	206	618
Books, Supplies (Approx.)	204	204	204	612
Personal Expenses (Approx.)	517	517	517	1,551
Total	\$4,270.00	\$4,270.00	\$4,270.00	\$12,810.00

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

*Estimated



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, Third, Warren, and Fifth 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 University 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 tele-

phone 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 or Leave form with their college academic advising or dean's office. Please see the W (Withdrawal) grade regulation that applies after the fourth week of instruction.

Weeks

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

THE UNDERGRADUATE PROGRAM

The undergraduate program consists of four four-unit courses each quarter, or sixteen units per quarter, for four years. Students must complete a minimum of thirty-six units in three consecutive quarters in order to satisfy the minimum progress requirements (see "Minimum Progress" in the "Academic Regulations" section). Undergraduate students wishing to take more than twenty 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, Third, Warren, and Fifth 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, depend-

UNDERGRADUATE REGISTRATION

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ing upon the student's major. Candidates for B.S. degrees in engineering are permitted 230 units (240 for engineering majors in Revelle and Fifth 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, I, K, L, or O-1. To establish residence you must be physically present in California for more than one year and you must have come here with the intent to make California your home as opposed to coming to this state to go to school. Physical presence within the state solely for educational purposes does not constitute the establishment of California residence, regardless of the length of your stay. You must demonstrate your intention to make California your home by severing your residential ties with your former state of residence and establishing those ties with California. If these steps are delayed, the one-year durational period will be extended until you have demonstrated both presence and intent for one full year. Effective fall 1993, if your parents are not residents of California or you were not previously enrolled as a UC student, you will be required to be financially independent in order to be a resident for tuition purposes. Your residence cannot be derived from your spouse or your parents.

REQUIREMENTS FOR FINANCIAL INDEPENDENCE

You will be considered "financially independent" if one or more of the following applies: (1) you are at least twenty-four years of age by December 31 of the calendar year for which you are requesting residence classification; (2) you are a veteran of the U.S. Armed Forces; (3) you are a ward of the court or both parents are deceased; (4) you have legal dependents other than a spouse; (5) you are married, or a graduate student or a professional student, and you were not claimed as an income tax deduction by your parents or any other individual for the tax year immediately preceding the term for which you are requesting resident classification; or (6) you are a single undergraduate student and you were not claimed as an income tax deduction by your parents or any other individual for the two tax years immediately preceding the term for which you are requesting resident classification, and you can demonstrate self-sufficiency for those years and the current year. (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 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.

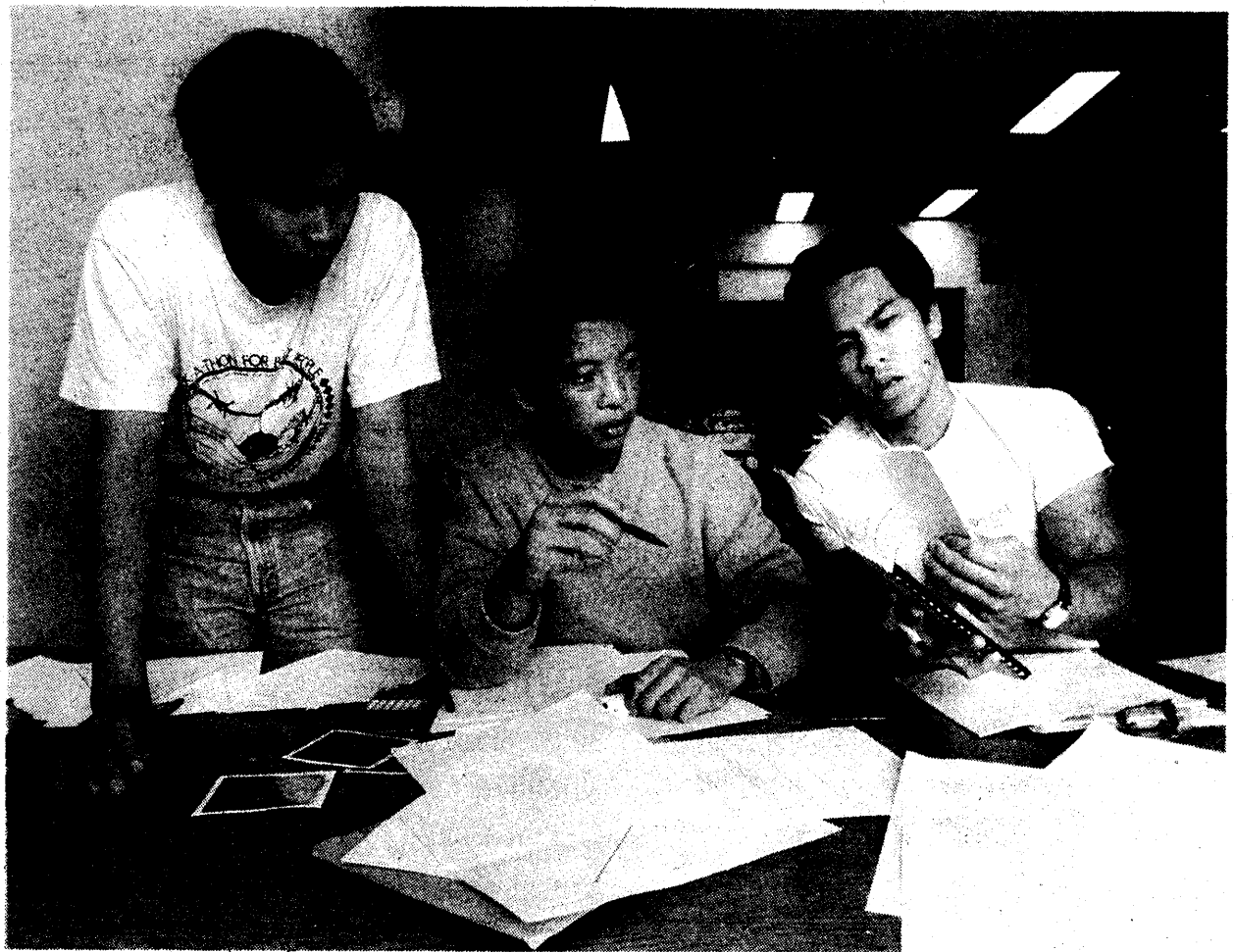
GENERAL RULES APPLYING TO MINORS

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 post-secondary institution within one year of your parent(s)' departure; and
3. once enrolled, you maintain continuous attendance in that institution.

Two-Year Care and Control

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

siding 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

UNDERGRADUATE REGISTRATION

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 petition in person 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

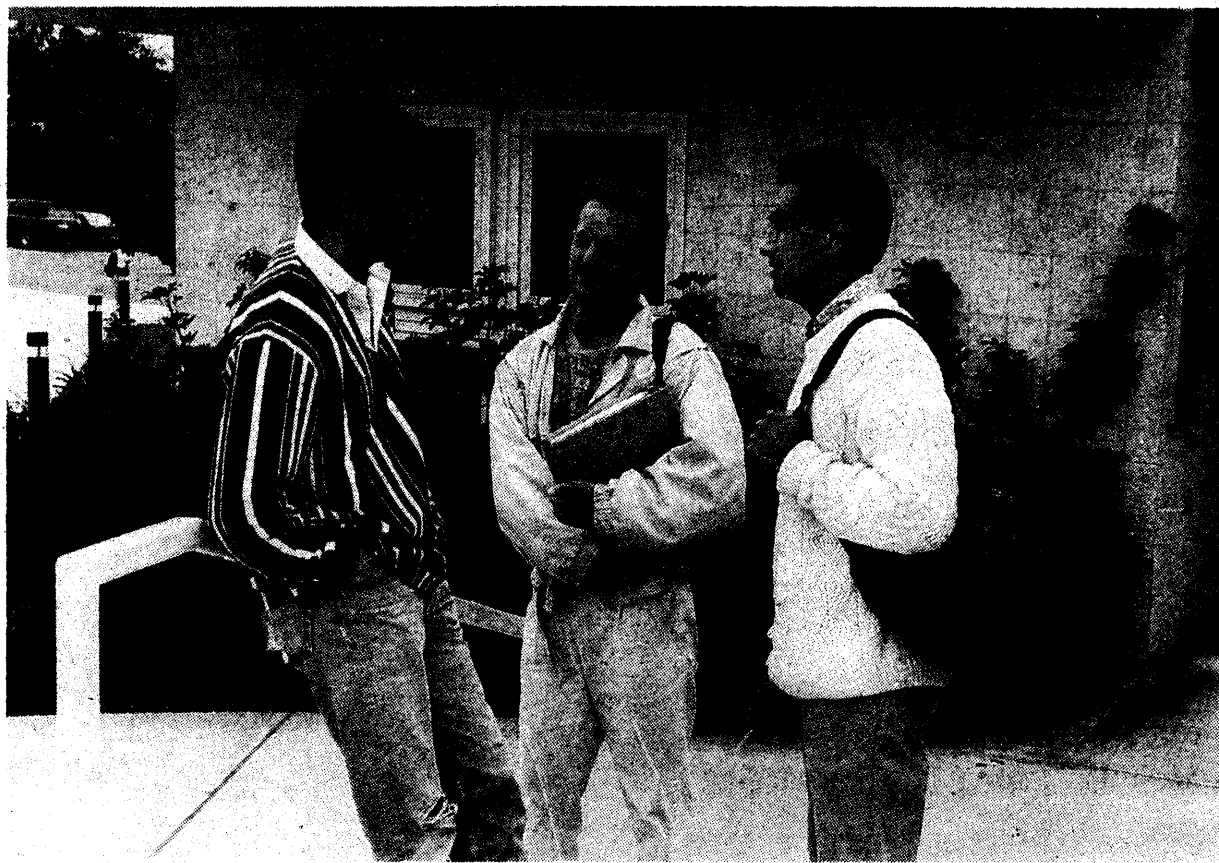
Inquiries regarding residence requirements, determinations, and/or recognized exceptions should be directed to the Residence Deputy, Office of the Registrar, 9500 Gilman Drive, La Jolla, CA 92093-0021, or the Legal Analyst-Residence Matters, Office of the General Counsel, University of California, 300 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 you are receiving financial aid, graduate support or university fee waivers, and decide not to attend UCSD, to return the top part of your statement with the back filled out indicating that you will not be attending. 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, Stafford, and Supplemental Student Loans (SLS). **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 loans, including Perkins, Stafford, university, and SLS have a pre-loan counseling session wherein they are

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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 \$25 non-refundable 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 two buildings in the Matthews Administrative and Academic Complex. The administrative units including check disbursement are adjacent to the Student Financial Services buildings next to the tennis courts. The building number is 211/212. The Central Cashier's Office is immediately southeast of the tennis courts at the intersection of Myers and Rupertus drives in Building No. 401.

OFFICE HOURS

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" below.)

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 ninety 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.

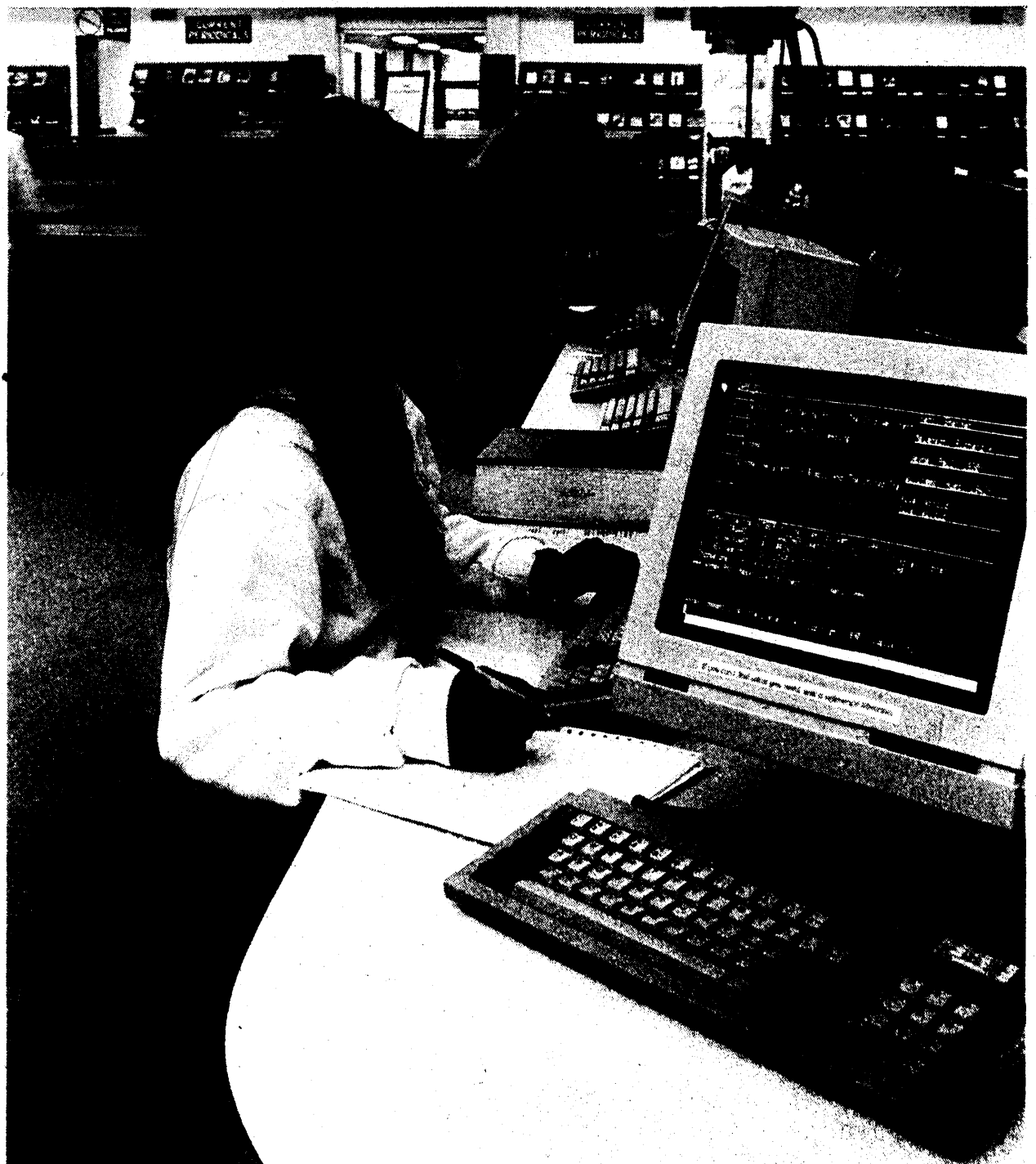
NONRESIDENT TUITION

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 approximately \$700 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



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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 \$36 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 \$2,586 per year. The educational fee may be reduced by one-half for students approved on part-time status.

TEMPORARY GENERAL FEE

A new temporary general fee was established by the regents to help offset reductions in state funding. The fee is \$150 per year, and it is effective for all students beginning fall quarter 1993.

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 undergraduate)	\$100
Application fee (one campus)	40
Each additional campus	40
Duplicate Photo I.D. Card	10
Request to Receive/Remove Grade "I"	5
Transcript of record	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 individ-

ual 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

UNDERGRADUATE DEGREE REQUIREMENTS

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

CHANGES IN REQUIREMENTS

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

Students transferring to UCSD from another UC campus who have completed their lower-division general-education requirements at a UC campus are considered to have met UCSD's lower-division general-education requirements. 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. Except in unusual cases and with the approval of the Committee on Educational Policy, the two majors may not be within a single department, nor may a departmental major be combined with a major in an interdepartmental or interdisciplinary program associated with that department.

a. A student with a double major must fulfill the separate requirements of each major, and the equivalent of at least eight upper-division courses (thirty-two units) must be unique to each major. Courses taken in fulfillment of lower-division requirements may overlap to any degree.

b. Both majors and degrees will be noted on the student's transcript and one diploma.

c. A student who has declared a double major may not graduate in one major prior to the completion of all requirements for both majors.

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, HIUS 100, HIUS 101, HIUS 112, HIUS 120, HIUS 121, HIUS 122, HIUS 123, HIUS 130, HIUS 131, HIUS 140, HIUS 141, HIUS 150, HIUS 151, or HIUS 152; 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 a 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 state.

7. By presenting proof of successful completion of a 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 600 or better on either the English Composition Test or the En-

English Composition with Essay Test, achievement tests of the College Entrance Examination Board (CEEB) (Note: not to be confused with the verbal portion of the Scholastic Aptitude Test [SAT]); 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 a transfer-level college course of four quarter-units or three semester-units in English composition with a grade of C or better; or
5. Submitting proof of scoring a "Pass for Credit" on the California State University English Equivalency Examination (Note: the CSU English Placement test may *not* be used to satisfy the Subject A requirement); or
6. 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. Stu-

dents 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 represent 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 reenrollment 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 Fifth 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, Quantitative Economics and Decision Sciences, History, Judaic Studies, Linguistics, Literature, Muir Special Project, Music, Philosophy, Political Science, Psychology, Sociology, and Theatre.

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 ad-

ACADEMIC REGULATIONS

vising 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.

SPECIFIC REGULATIONS

PROGRESS TOWARD DEGREES

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

PROBATION

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

SUBJECT TO DISQUALIFICATION

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

If a student is not currently in scholastic good standing or has been denied registration for the next ensuing quarter on the date on which he or she left the university, a statement of his or her status shall accompany his or her transcript. A student who has been disqualified from further registration at the University of California may not register for UCSD courses through Summer Session, through

UCSD Extension by way of the concurrent enrollment mechanism, or in UCSD Extension courses offered at the 100 level. Students receiving financial assistance should refer to information in the 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 de-

partment 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 secure the department stamp on a Preferred Enrollment Request or Add/Drop Card to enroll or add a class.
3. A final grade will not be assigned to a student unless a copy of the approved application is on file in the Office of the Registrar.

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 provost of the student's college.

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. (See "The W Grade").

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

GRADE POINTS

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

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

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

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.

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 UCSD Extension courses. A graduate student's GPA will be calculated over courses taken while in graduate standing.

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 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.

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 course units taken at UCSD and counted in satisfaction of degree requirements 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 two 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 be entered 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.

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.
3. There is a \$5 processing fee, payable to the Cashier's Office, which should be paid by the student *prior* to filing the form with the instructor.
4. 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**.
5. 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.

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 \$4 fee is charged per copy. Checks should be made payable to the Regents of the University of California.

GRADE APPEALS

- A. 1. If a student believes that nonacademic criteria have been used in determining his or her grade in a course, he or she may follow the procedures described in this regulation.
2. *Nonacademic criteria* means criteria not directly reflective of academic performance in this course. It includes discrimination on political grounds or for reasons of race, religion, sex, or ethnic origin.
3. Appeals to this committee [see (B)(4)] shall be considered confidential unless both the complainant and the instructor agree otherwise. They may agree to allow the student representatives to the committee to participate in the deliberations of the committee, or they may agree to open the deliberations to members of the university community.
- B. 1. The student may attempt to resolve the grievance with the instructor within the first month of the following regular academic quarter.

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

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

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

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

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

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

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

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

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

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

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

4. If the Committee determines that nonacademic criteria were significant factors in establishing the grade, it shall give the student the option of either receiving a

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

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

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

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

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

2. No punitive actions may be taken against the complainant solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the complainant's file. The

instructor may, if he or she feels that his or her record has been impugned by false or unfounded charges, file charges against the complainant through the office of the vice chancellor for Student Affairs, the dean of Graduate Studies, or the associate dean for Student Affairs of the School of Medicine.

UCSD POLICY ON INTEGRITY OF SCHOLARSHIP

The principle of honesty must be upheld if the integrity of scholarship is to be maintained by an academic community. The university expects that both faculty and students will 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. Officers of instruction, hereinafter called instructors, for their part, will exercise care in planning and supervising academic work so the honest effort will be encouraged.

ACADEMIC DISHONESTY

No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort; for example:

1. No student shall knowingly procure, provide, or accept any materials that contain questions or answers to any examination or assignment to be given at a subsequent time.

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

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

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

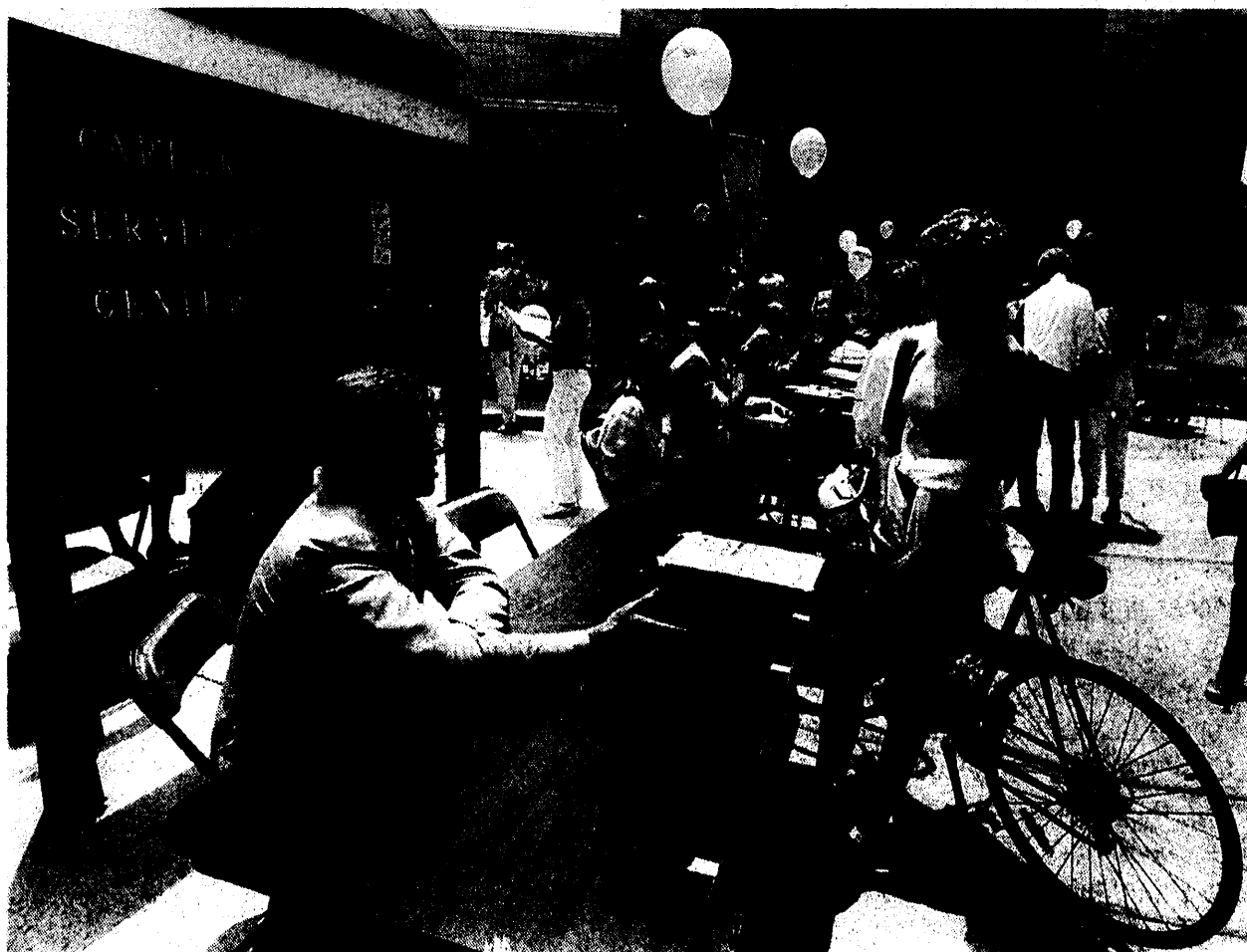
5. No student shall employ aids excluded by the instructor in undertaking course work.

6. No student shall, without proper permission, alter graded class assignments or examinations and then resubmit them for regrading.

RESPONSIBILITY

Instructors should state the objectives and requirements of each course at the beginning of the term, clearly informing students what kinds of aid and collaboration, if any, on assignments are permitted. Students are expected to complete the course requirements in compliance with the standards described above.

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 sepa-



rate 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 student's college (or the assistant dean of Graduate Studies or the dean of students in the School of Medicine) shall impose an administrative penalty. 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

The procedure for disposition of cases of academic dishonesty is divided into three phases:

A. *The Initial Phase:* When an instructor suspects a student of having committed a dishonest act in completing an assignment, he or she shall call the student to a meeting to discuss the charges, the evidence, and the proposed academic consequence. The instructor shall also inform the appropriate college dean (or the assistant dean of Graduate Studies or the dean of students at the School of Medicine). The dean shall then call the student to a meeting to discuss the case and the proposed administrative penalty. (Alternatively the instructor may choose to meet initially with the student and the dean together to discuss the case and the proposed academic and administrative penalties.) At the meeting with the dean, the student shall be advised in writing by the appropriate dean of the charges and of his or her rights under the UCSD Policy on Integrity of Scholarship.

The student shall have ten calendar days following the meeting with the dean to decide whether (1) to accept the charge of academic dishonesty and the proposed academic consequences and administrative penalties, (2) to deny the charge of dishonesty and to proceed to a formal hearing as provided in Paragraph B, or (3) to accept the charge of dishonesty but to appeal the proposed actions as provided in paragraphs D and E. Unless the student informs the dean and the instructor otherwise within this ten-day period, he or she shall be presumed to have taken decision (1).

If decision (1) is taken, a record of the academic consequences and administrative penalties shall be maintained in the offices of the appropriate dean, and a copy of the record shall be sent to the chair of the department in which the violation occurred.

B. *The Hearing Phase:* If within ten calendar days of his or her meeting with the dean the student denies having committed the alleged act of academic dishonesty and requests in writing a formal hearing, the case shall be referred by the dean to the chair of the department in which the alleged violation occurred. Within ten calendar days the chair shall appoint an ad hoc committee composed of three faculty members from within the department or a related field and two students—either graduate students or seniors—from within or without the department to hear the case. The ad hoc committee shall hold a formal hearing within ten calendar days of its appointment and decide on the basis of the preponderance of evidence whether the student did engage in academic dishonesty. A hearing officer, selected from a board consisting of the student conduct coordinator and college deans, shall conduct the hearing and shall advise the ad hoc committee on procedure, but shall not vote. The ad hoc committee shall be governed by the general university rules of procedural due process. Within five calendar days from the date the hearing is completed, the hearing offices shall forward the ad hoc committee's findings with explanations to the appropriate dean, or designee, with copies to the department chair, the instructor, and the accused student. Within five calendar days after receipt of the notice of the ad hoc committee's final judgment in the case, the appropriate dean shall inform the student in writing of the findings of the committee and the administrative actions taken.

If the ad hoc committee 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:*
1. If the ad hoc committee sustains the charge of academic dishonesty, an undergraduate student may appeal that judgment

in writing to the appropriate college provost within fifteen calendar days from the date of the notice from the dean. A graduate student shall submit an appeal to the dean of Graduate Studies. A medical student shall submit an appeal to the dean of the School of Medicine. The basis for appeal of the ad hoc committee'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 that has substantial bearing on the findings of the ad hoc committee.

If the appeal is sustained, the case shall be referred back to the ad hoc committee, reconstituted if necessary, for new hearing. Except for such appeals, the finding of the ad hoc committee shall be final.

2. Within three calendar days of receipt of the dean's letter, the student may appeal the instructor's determination of the academic consequence, as provided in paragraph D, the dean's administrative penalty as provided in paragraph E, or both.

D. *Request for Reduction 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 an ad hoc committee, the CEP Subcommittee on Grade Appeals shall receive the report of the ad hoc committee and accept its findings as to the facts of the case.

E. *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, by a graduate student to the dean of Graduate Studies, or by a medical student to the dean of the School of Medicine.

F. *Other Governing Policy:*
1. If the case has not been adjudicated before the end of the quarter, the instructor shall give the student no grade in the course, but shall put a faculty hold in the memoranda column of the grade report. While the case is pending, the student may not drop the course in which he or she is accused of dishonesty.



2. If a case has not been adjudicated before the end of the quarter, the case may be continued the next regular academic quarter.

3. If the student withdraws from the university 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, this fact shall be noted on the transcript. Any administrative penalty less severe than dismissal shall be imposed when the student returns to the university.

4. 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, the dean of Graduate Studies, or the vice chancellor for Health Sciences. The student's transcript shall bear the entry "Dismissed for Academic Dishonesty."

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.

ROTC

UCSD does not have an ROTC program. Students may, however, with the permission of their college, enroll in ROTC courses at another institution in conjunction with completing their degree programs at UCSD.

ROTC courses are conducted on the campuses of the University of San Diego and San Diego State University (College of Extended Studies) for the Navy and USMC ROTC, and at San Diego State University for Army and Air Force ROTC. Field training is conducted off campus as is the Flying Instruction Program, which is conducted at a local civilian flying school. Summer training is required for all students during one or more summers.

Upon completion of the program and all requirements for a bachelor's degree at UCSD, cadets are commissioned as second lieutenants in the Air Force, Army, or Marine Corps, or as ensigns in the Navy. Further information on these programs may be obtained from the ROTC adviser at the Aerospace Studies Department, 265-5545, and the Military Science Department, 265-4943, at San Diego State University or the Department of Naval Science, 260-4811, at the University of San Diego. Information pamphlets are available in the Office of the Registrar at UCSD.

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

ACADEMIC REGULATIONS

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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

Registered students who wish to withdraw during the quarter are required to complete the Undergraduate Application for Withdrawal. Students who have completed the quarter and have enrolled in classes for the subsequent quarter, but have not yet paid fees for that quarter, should complete the Request for Leave form. Both forms should be filed with their college academic advising or dean's office. These forms serve two purposes: 1) a refund of fees if appropriate (see below); 2) automatic withdrawal from classes (see also "The W Grade"). Students desiring to be absent are urged to consult with their provost's office. The provosts recognize the need for some students to "stop out" for a while. Each provost's office is prepared to deal, in a totally flexible manner, with any changes in the plans of the student or with any problems the student may have.

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.

CONTINUING AND READMITTED STUDENTS

There is a service charge of \$10 for cancellation of registration or withdrawal before the first day of instruction. The following

schedule of refunds is effective beginning with the first day of instruction and refers to calendar days:

1-14 days	15-21 days	22-28 days	29-35 days	36 days and over
80 percent	60 percent	40 percent	20 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.



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 merging of administrative responsibilities 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. A Ph.D. degree is the culmination of creative effort; it attests to the ability of the recipient to continue original inquiry. In addition to requiring original research, the Office of Graduate Studies and Research strongly encourages all of its doctoral candidates to obtain teaching experience.

La Jolla has become one of the most important intellectual centers of the West. Not only has the university attracted many of the world's great scholars, but other research institutions such as the Salk Institute for Biolog-

ical Studies and the Scripps Clinic and Research Foundation have enhanced the area's reputation. From the 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 individ-

uals who have come here to work within the research institutes at the UCSD campus.

THE NATURE OF GRADUATE INSTRUCTION

Graduate courses demand, on the part of both instructor and student, a capacity for critical analysis and a degree of research interest beyond those appropriate for undergraduate study. These courses generally carry a number in the 200 series and may be conducted in any of several ways: (1) as advanced lecture courses; (2) as seminars in which faculty and students present critical studies of selected problems within the subject field; (3) as independent reading or study under faculty supervision; or (4) as research projects conducted under faculty supervision. Graduate courses numbered 400-499 are designed for professional programs 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.Arch. and M.P.I.A. Courses at the upper-division level (100-197) may be offered in partial satisfaction of the requirements for an advanced degree.

Graduate students who take lower-division courses (1-99), may only take them on an S/U basis, except for students in the M.P.I.A. program who may take lower-division language courses for a letter grade.

The graduate student is accorded considerable liberty in choice of courses as long as minimum departmental core course, grading standards, and residence requirements are met.

ADMINISTRATION

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, a standing committee of the Academic Senate, 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 appointed by the dean of Graduate Studies and is the person 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 in the planning and construction of the graduate program in the department, group, or school.

GRADUATE STUDENT ASSOCIATION

The Graduate Student Association (GSA) is the officially recognized graduate student representative body 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 statewide areas. The GSA, composed of four executive officers and two representatives from each department, group and school, nominates graduate student representatives for appointment to campus governing bodies and committees, including the Academic Senate, 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 students.

GRADUATE STUDENT AFFIRMATIVE ACTION

The University of California, San Diego actively recruits and admits students to graduate programs from those groups traditionally underrepresented as a result of economic, educational, or societal inequities.

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

Ethnic minority students, disabled students in graduate programs in all fields, and women students in engineering and the sciences, where they are traditionally underrepresented, are eligible for awards through the San Diego Fellowship Program. Fellows currently receive \$750 per month (a combination stipend and research assistantship) plus tuition and/or fees. Integral to the fellowship experience, fellows are assigned a faculty mentor in the major department to assist with academic and research goals.

The forms of financial support for subsequent years include 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 Fifth College, (619) 534-2770 or 534-3555.

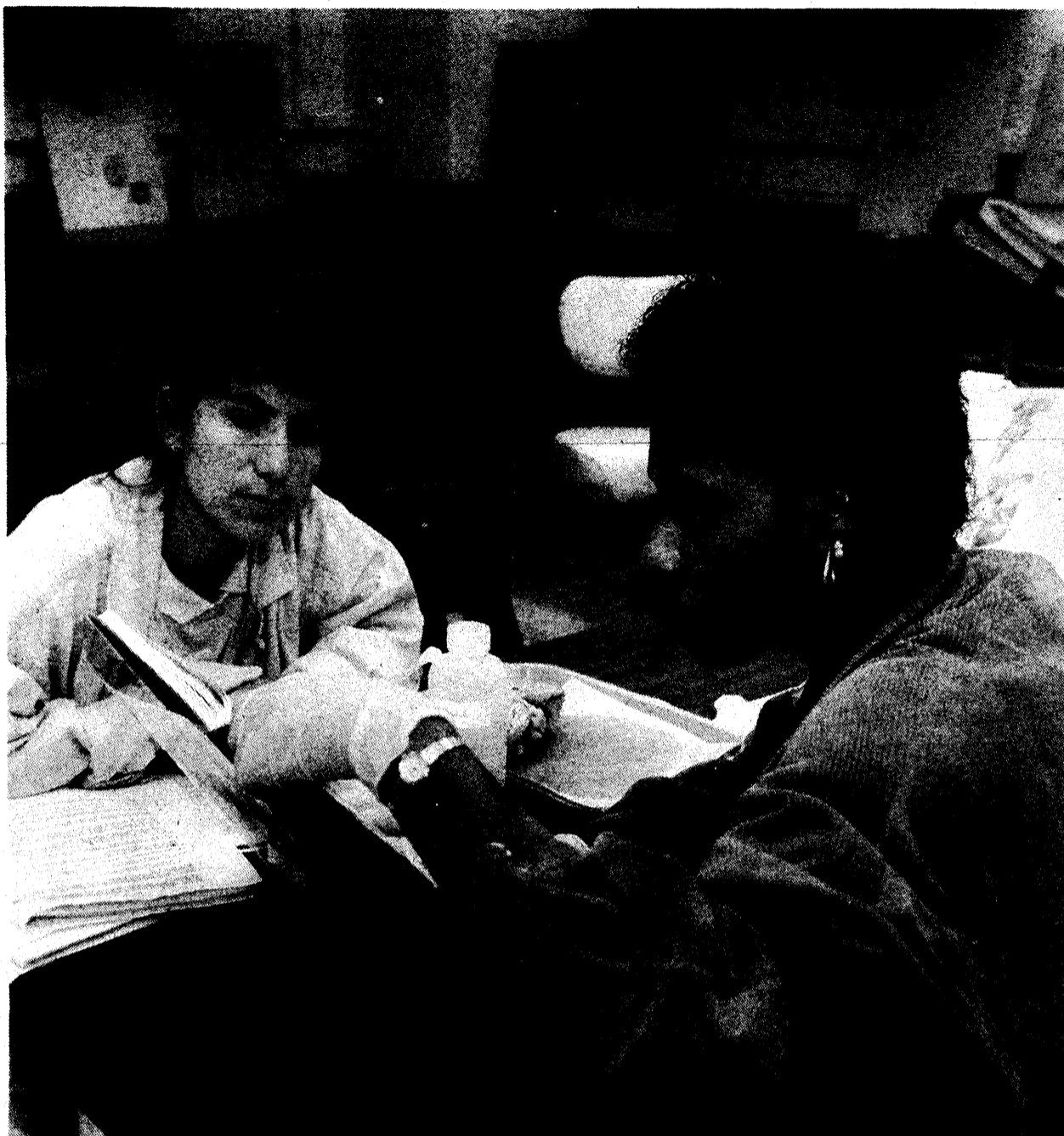
GRADUATE DEGREES OFFERED: 1993-94

Anthropology	Ph.D.*	Engineering Sciences (Applied Mechanics) (Joint doctoral degree with San Diego State University)	Ph.D.
Architecture	M.Arch.I** M.Arch.II** M.S.**	History (Judaic Studies)	M.A., Ph.D. M.A.
Biology	Ph.D.	International Affairs Pacific International Affairs	M.P.I.A. Ph.D.
Biology (Joint doctoral degree with San Diego State University)	Ph.D.	International Affairs	Ph.D.
Biomedical Sciences	Ph.D.*	Latin American Studies	M.A.
Chemistry	Ph.D.*	Linguistics	Ph.D.*
Chemistry (Joint doctoral degree with San Diego State University)	Ph.D.	Literature Comparative English and American French German Spanish	Ph.D. M.A. M.A. M.A. M.A. M.A.
Clinical Psychology (Joint doctoral degree with San Diego State University)	Ph.D.	Marine Biology	Ph.D.*
Cognitive Science	Ph.D.*	Materials Science	M.S., Ph.D.
Communication	Ph.D.*	Mathematics Mathematics (Applied) Statistics	M.A., Ph.D. M.A. M.S.
Comparative Studies in Language, Society, and Culture	Ph.D.§	Molecular Pathology	Ph.D.
Computer Science (Computer Engineering)	M.S., Ph.D. M.S., Ph.D.	Music	M.A., Ph.D.
Earth Sciences	Ph.D.*	Neurosciences	Ph.D.*
Economics	Ph.D.*	Oceanography	Ph.D.*
Electrical Engineering (Applied Ocean Science) (Applied Physics) (Computer Engineering) (Communication Theory and Systems) (Electronic Circuits and Systems) (Intelligence Systems, Robotics and Control) (Photonics)	M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D.	Philosophy	Ph.D.*
Engineering Sciences (Aerospace Engineering) (Applied Mechanics) (Applied Ocean Science) (Bioengineering) (Chemical Engineering) (Engineering Physics) (Mechanical Engineering) (Structural Engineering)	M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D.	Physics (Biophysics)	M.S., Ph.D. 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.
		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.

**Approval pending.

§Students who have completed some graduate study at UCSD and have been admitted to a doctoral program may apply for this interdisciplinary program.



For information, 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 nonacademic 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 "Career Services."

GENERAL REQUIREMENTS FOR HIGHER DEGREES

COURSES AND GRADES

Only upper-division and graduate courses in which a student is assigned grades A, B, C (including plus [+] or minus [-]), D, or S are counted in satisfaction of the requirements for the master of architecture, master of fine arts, master of Pacific international affairs, master of arts, master of science, 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 may be used in the program for the M.P.I.A. or M. Arch. degrees offered by the Graduate School of International Relations and Pacific Studies and the

School of Architecture respectively. For course information see sections on "International Relations and Pacific Studies" and "Architecture" 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.

Information covering thesis preparation is contained in the publication, *Instructions for the Preparation and Submission of Doctoral Dissertations and Masters' Theses*, which is mailed to students electing Plan I, upon their advancement to candidacy. The completed

thesis is submitted to the thesis committee for review.

When all members of the committee have approved the thesis, a Final Report of the Thesis for the Master of Arts or Master of Science Degree under Plan I must be completed. The candidate submits the thesis to the Office of Graduate Studies and Research and upon approval by the dean of Graduate Studies, files the thesis with the university archivist who accepts it on behalf of the Graduate Council. Acceptance of the thesis by the archivist with a subsequent second approval by the dean of Graduate Studies represents the final step in the completion of all requirements by the candidate for a master of arts or master of science degree on the San Diego campus.

PLAN II: COMPREHENSIVE EXAMINATION PLAN

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, with 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 any source.

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 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 com-



GRADUATE STUDIES

pletion of all requirements by the candidate for a master of fine arts degree on the San Diego campus.

ACADEMIC RESIDENCE

The minimum residence requirement is six academic quarters for visual arts and eight academic quarters for theatre, at least one of which must follow advancement to candidacy in either program. Academic residence is met by satisfactory completion of six units or more per quarter, some of which must be graduate level. The entire residence requirement must be satisfied at UCSD.

A candidate must be registered in the quarter in which the degree is to be awarded. (See "Registration in the Final Quarter.")

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, with 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.

THE MASTER OF PACIFIC INTERNATIONAL AFFAIRS

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 curric-

ulum, please refer to the Graduate School of International Relations and Pacific Studies description under the catalog listings of programs of instruction.

THE DOCTOR OF PHILOSOPHY DEGREE

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

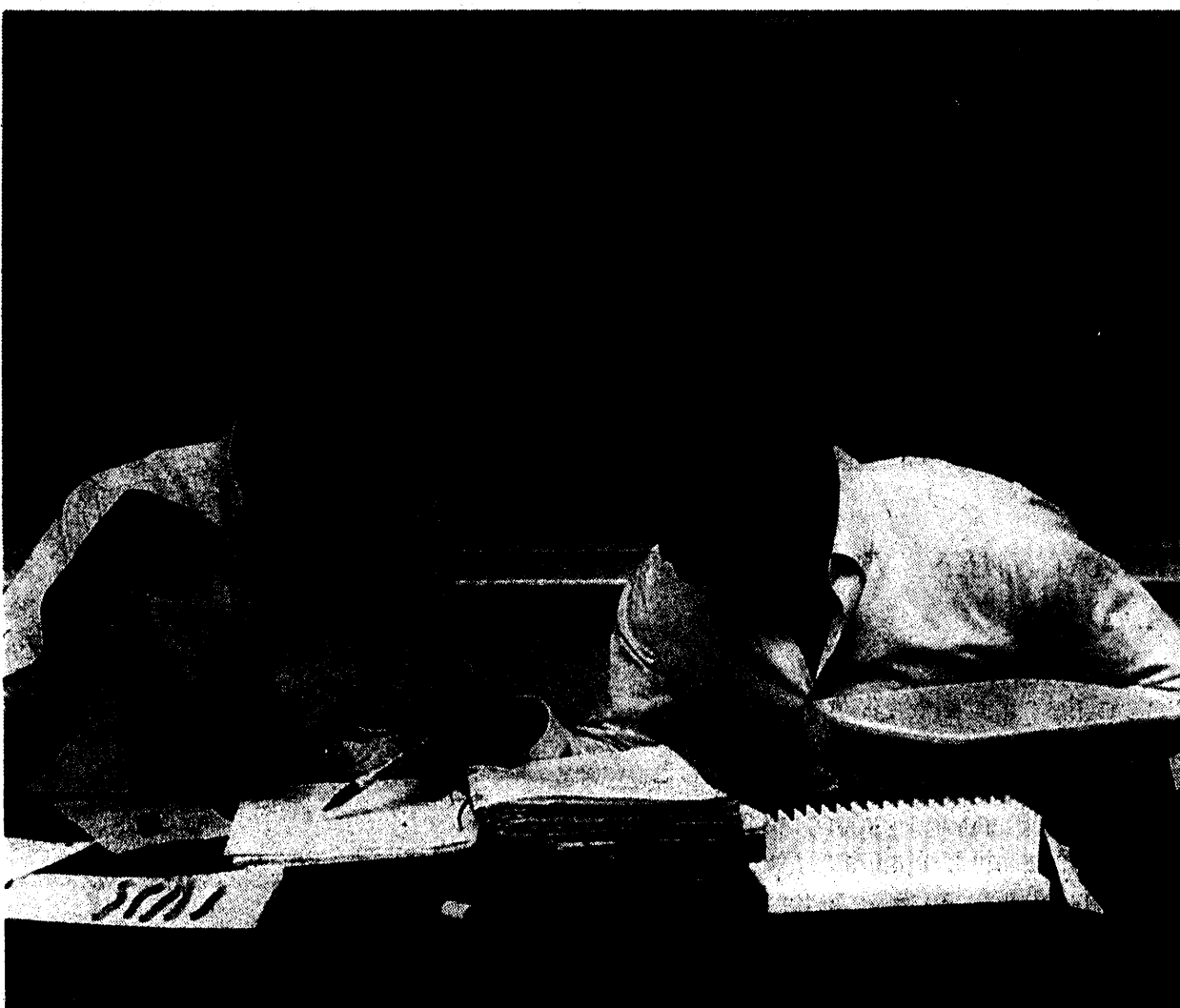
supervises the student's activities until the appointment of the doctoral committee. A doctoral program generally involves two stages.

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 four time limits pertaining to students' academic progress toward the Ph.D. degree.

The foundation of the policy is normative time. Normative time is a standard established for the time period in which students, under normal circumstances, are expected to complete requirements for the Ph.D. degree in a particular discipline. Students, in consultation with their faculty advisers, are expected to plan their programs of study for completion within the normative time period for their discipline. The normative times for Ph.D. programs at UCSD are listed on the following page.

In addition to normative time, each Ph.D. program has three maximum time limits: (1) maximum registered time in which a student must advance to Ph.D. candidacy; (2) maximum registered time during which a doctoral student is eligible for support; and (3) maximum registered time in which a student must complete all Ph.D. requirements. Students will not be permitted to continue in doctoral status after the expiration of the pre-candidacy and total registered time limits. Students will not be permitted to receive UCSD-administered financial support after the expiration of the support limits. Information about these time limits is given in the descriptions of each department's graduate program in the *UCSD General 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 normative time and the maximum time during which a student is eligible to receive support, the normative time and time limits policies define accrued time as elapsed time from first enrollment as a graduate student at UCSD, less (a) up to three quarters while on a formal leave of absence or withdrawn; and (b) time between completion of or withdrawal from one graduate program at UCSD and first registration in a different field of study. 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, non-degree, or inter-campus 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.

Policy changes in the normative time program and on the time-to-degree policy were implemented in 1989-90. Further information may be obtained from the Office of Graduate Studies and Research.

ACADEMIC RESIDENCE

The minimum residence requirement for the 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 major department, group, or school, and one of these two must be a tenured UCSD faculty member.

RECONSTITUTED DOCTORAL COMMITTEE

For a variety of reasons a doctoral committee may have to be reconstituted. The request

for reconstitution of the membership of a doctoral committee, including departmental affiliation of the members of the proposed committee, together with the reasons for requesting the change 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.

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.

NORMATIVE TIMES FOR DOCTORAL PROGRAMS

<u>Department/Group/School/Program</u>	<u>Normative Time</u>	<u>Department/Group/School/Program</u>	<u>Normative Time</u>
	Years		Years
Anthropology	6	History	6
Applied Mechanics and Engineering Sciences		International Affairs	5
(Aerospace Engineering)	5	Linguistics	6
(Applied Mechanics)	5	Literature	6
(Applied Ocean Science)	5	Materials Science	5
(Bioengineering)	5	Mathematics	5
(Bioengineering) Ph.D.-M.D. program	7	Molecular Pathology	5
(Chemical Engineering)	5	Molecular Pathology Ph.D.-M.D. program	7
(Engineering Physics)	6	Music	
(Mechanical Engineering)	5	With master's from another university	4
(Structural Engineering)	5	Without master's from another university	6
Biology	5	Neurosciences	5
Biology Ph.D.-M.D. program	7	Neurosciences Ph.D.-M.D. program	7
Biomedical Sciences	6	Philosophy	6
Biomedical Sciences Ph.D.-M.D. program	8	Physics	
Chemistry	5 $\frac{1}{3}$	Theoretical Physics	5
Chemistry Ph.D.-M.D. program	7 $\frac{1}{3}$	Experimental Physics	6
Clinical Psychology	5	Theoretical Physics Ph.D.-M.D. program	7
Cognitive Science	6	Experimental Physics Ph.D.-M.D. program	8
Communication	6	Physics	
Comparative Studies in Language, Society and Culture	6	(Biophysics)	6
Computer Science		Political Science	
(Computer Engineering)		Without field study	5
With master's from another university	4	With field study	6
Without master's from another university	5	Psychology	5
Economics	5	Psychology Ph.D.-M.D. program	7
Electrical Engineering		Scripps Institution of Oceanography	
(Applied Ocean Science)		Oceanography	6
(Applied Physics)		Earth Sciences	6
(Communication Theory and Systems)		Marine Biology	6
(Computer Engineering)		Sociology	6
(Intelligence Systems, Robotics and Control)			
With master's from another university	5		
Without master's from another university	6		



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.

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 Certificate 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.

SPECIAL DEGREE PROGRAMS

GRADUATE PROGRAMS IN THE HEALTH SCIENCES

The university offers research training programs in the health sciences leading to the

doctor of philosophy degree. The purpose of these graduate programs is to prepare students for careers in research and teaching in the basic medical sciences. Program requirements are flexible, consisting of graduate courses and supervised laboratory or clinical investigation. Graduate programs in the health sciences are offered by (1) regular campus-wide departments with activities related to the health sciences, for example, the Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry, and Psychology and (2) interdisciplinary groups of faculty drawn from the School of Medicine and from campus-wide 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), bioengineering, biology, biophysics, chemistry, clinical psychology, molecular pathology, neurosciences, physics, 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, engineering sciences (applied mechanics), 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, Mechanical Engineering, Psychology, or the Office of the Dean, College of Engineering, or School of Public Health, at San Diego State University.

SPECIAL PROGRAMS

INTERCAMPUS EXCHANGE PROGRAM FOR GRADUATE STUDENTS

An advanced 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, may become an intercampus exchange student on that UC campus.

Informal arrangements between departmental faculty on the two campuses should 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, signed by the student's adviser and the graduate dean of the home campus, is forwarded for signature by the department and the graduate dean on the host campus.

Registration is accomplished by the student registering and paying all required fees at the home campus, and then presenting a validated student photo-identification card to the Office of the Registrar on the host campus. In turn, the registrar will issue a Student Identification Card for 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 intercam-

GRADUATE STUDIES

pus 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)

The research and study programs of graduate students may require them to be off campus for extended periods of five weeks or more. 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. 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 major 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 employment as outlined under the financial assistance section apply to off-campus study as well as on-campus study.

UCSD EXTENSION

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.

Students wishing to offer UCSD Extension course work 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 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.

EDUCATION ABROAD PROGRAM

This statewide program is coordinated on the San Diego campus by the Programs Abroad Office. Study abroad is presently available on campuses in Australia, Austria, Brazil, Canada, Chile, Costa Rica, Denmark, Egypt, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Mexico, New Zealand, Norway, People's Republic of China, Russia, Spain, Sweden, Taiwan, Thailand, Togo, and the United Kingdom.

Graduate students may apply to study at most 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.

Selection procedures involve an interview with members of the Education Abroad Pro-

gram Selection Committee and, in some cases, a final acceptance by the host university.

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 interested in pursuing other activities involving study, research, work, or travel abroad.

See also Education Abroad Program in chapter entitled "Courses, Curricula, and Programs of Instruction."

POSTDOCTORAL STUDY

Postdoctoral scholars, trainees, and 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 enrollment and census of postdoctoral scholars undertaking training at UCSD. A scholar is enrolled by means of a Postdoctoral Study and Training Enrollment 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, DentiCare, a prepaid dental plan, and voluntary term life insurance 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, life insurance, and enrollment procedures may be obtained from administrative offices of departments, groups, schools, or organized research units.

FEES

For the 1992-93 academic year, the following schedule of fees applied. Based on past experience, fees for the 1993-94 academic year are expected to increase considerably.

FEES PER QUARTER*

	Resident	Non-Resident
Tuition	\$	\$2,566.00
Registration	231.00	231.00
Educational	710.00	710.00
Student Center	37.50	37.50
Recreation		
Facility	12.00	12.00
Graduate Student Assoc.	5.00	5.00
Health Insurance	165.00	165.00
Totals	\$1,160.50**	\$3,726.50**

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.	25
Transcript of Record	3
Late payment of fees (Late registration)	50
Late filing of enrollment cards (including Preferred-Program Request)	50
Returned check collection	10
Filing fee	115.50

*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) total \$805.50 for resident students and \$2,088.50 for nonresident students.

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. 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 213, 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.

Students who pay fees are automatically enrolled in the Student Limited Insurance Plan (SLIP). SLIP is provided without charge to all eligible students to help defray some of the expenses of outpatient care and is intended to supplement GSHIP.

The Graduate Student Health Insurance Plan (GSHIP) is a comprehensive group health plan and is mandatory for all graduate and professional students. GSHIP provides coverage year-round to include summer and holiday periods. To be covered under GSHIP over summer, a student must be enrolled in the plan for the preceding spring quarter. Students who



provide proof of health insurance benefits equal to or better than those of GSHIP may be granted a waiver. Waiver requests must be made in writing to the director of the Student Health Center, 0039. Dependent coverage is also available through GSHIP.

Premium payment for GSHIP is due with the payment of the registration fee. Premiums for students holding graduate academic employee 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. Dependents must enroll in GSHIP through the Student Health Services Office.

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▼ **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 throughout 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, 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, gymnasiums, 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 should 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 may receive partial refunds of fees 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 Academic Calendar.

TRANSCRIPT FEES

Students may obtain transcripts of their UCSD records from the Office of the Registrar for \$3 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 may be obtained from departmental, group, or school offices.

Descriptions in this section deal entirely with awards administered directly by the university. The terms *appointment* or *award* mean employment for compensation, award of a fellowship or scholarship, or any other formally recognized educational benefit.

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

The San Diego Fellowship, limited to minority students and women students in under-represented fields such as physics and mathe-



atics, currently provides a stipend of \$375 per month and a partial research assistantship of approximately \$375 per month plus tax-free resident fees and nonresident tuition, if applicable. These awards are usually given for two years.

Seven additional Cota-Robles fellowships for the top incoming minority students and women students in underrepresented fields 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.

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 research assistantship or research fellowship from available departmental resources. The amount of the supplement varies by department.

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 at UCSD are the following:

1. Regents Fellowships
2. San Diego Cota-Robles Fellowships

3. Fee Scholarships
4. Tuition Scholarships
5. Tuition and Fee Scholarships
6. U.S. Public Health Service Predoctoral Traineeships
7. Research Fellowships

ASSISTANTSHIPS

Graduate students may be appointed by UCSD on a part-time basis as research assistants and teaching assistants.

Graduate students enrolled full-time (twelve units or more) may be appointed at 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 research assistants 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 appointed as teaching or research assistants 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

The Tax Reform Act of 1986 made significant changes in the tax treatment of graduate student support awards. For merit-based awards made after August 16, 1986, the new tax law took effect January 1, 1987, 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. *Research and Teaching Assistants.* All compensation is taxable income.

3. Payment of tuition and fees under the Research Assistant 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 individual students on tax matters.

Limited written tax information is available from academic departmental offices, Student Legal Services, 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 Graduate Admission and Award Application. 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. students, all financial support administered by UCSD (including fellowships, scholarships, and employment 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 employed as teaching and language 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 the Central University Library, through the reference departments of other large libraries or the fellowship adviser in the Office of Graduate Studies and Research, 518 Fifth 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; AT&T; 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 Woodrow Wilson National Fellowship Foundation; and the Jacob Javits Fellowship Program.

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.

GENERAL POLICIES AND REQUIREMENTS

INTEGRITY OF SCHOLARSHIP

Graduate students are expected to adhere to the highest standards of academic integrity and honesty.

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 may appeal a course grade 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."

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.

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. Exceptions to normative time are not granted.

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. 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 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
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 *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 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. degree, graduate students may take any course on an S/U basis. All lower-division course work and noncredit courses shall be graded only on an S/U basis with the exception of language courses taken by students in the M.P.I.A. program.

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.

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 Graduate Admission Application 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 a Graduate Admission Application and submit it, together with a nonrefundable application fee of \$40, to the Office of Graduate Admissions. 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 in-

stitution, 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, **certi-**

fied 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 December in order to meet most departmental deadlines for admission.** The GRE is administered five times a year in the United States and in 133 other countries. 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.) Only one set of recommendation letters need be submitted in support of an application for admission and fellowship or assistantship consideration. 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, but did not enroll, should check with their major depart-

ment 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*

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.

*Subject to change

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).

ADMISSION AND REGISTRATION

Official admission to graduate study at the university is contingent upon review of an applicant's record, receipt of final undergraduate transcript showing degree(s) awarded, 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 together with requested 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. (See "Part-Time Study.")

SCHEDULE OF CLASSES

Detailed information on registration and enrollment procedures is contained in the quarterly *Schedule of Classes*, available for pur-

chase at the University Bookstore several weeks before the beginning of the quarter.

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 want to use the telephone 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.

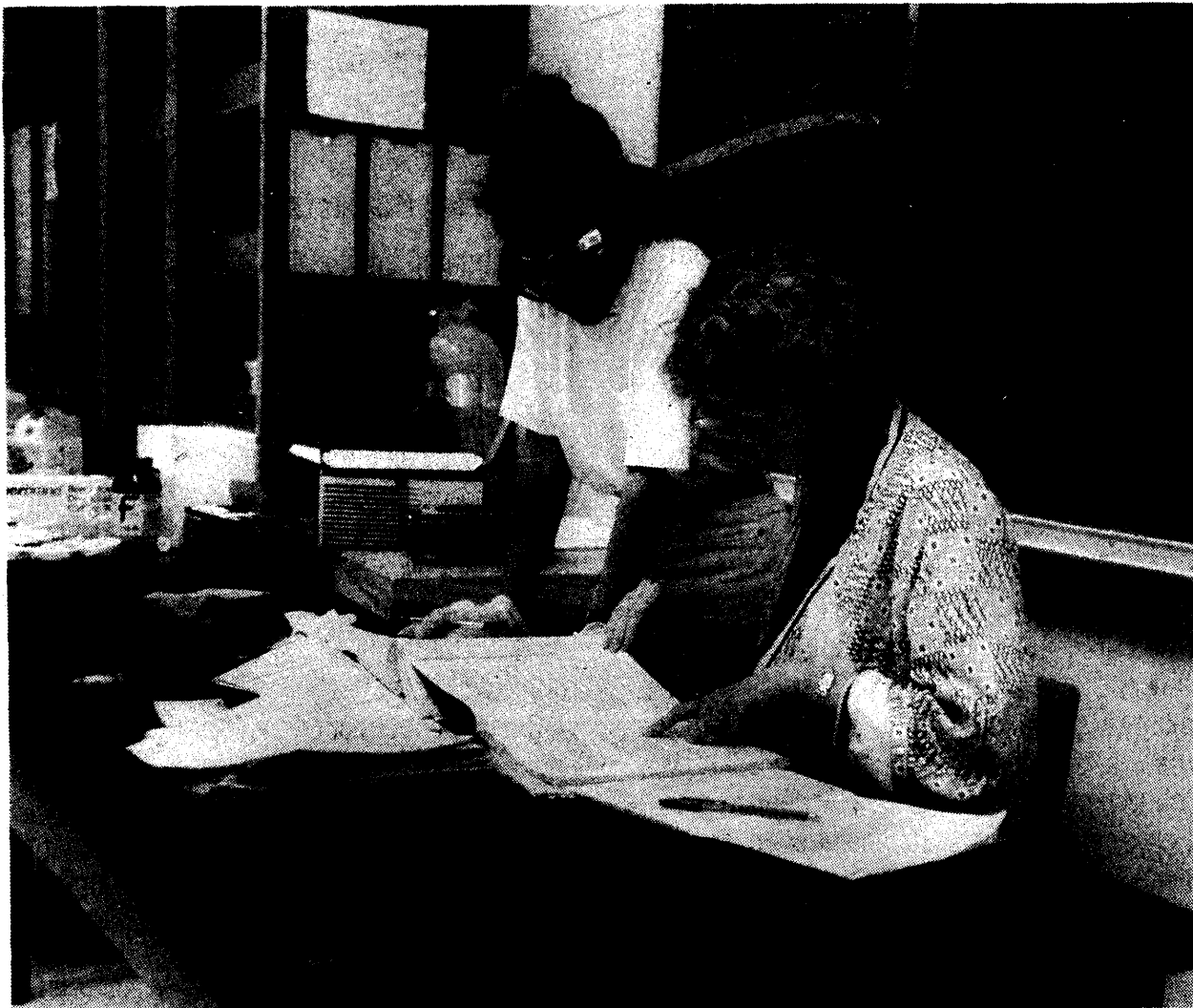
REGISTRATION RECEIPT

Upon payment of fees, 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.

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 offices.

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 "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 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 Teaching and Research Assistants:

TAs, RAs, and associates may pay resident fees but not nonresident tuition by payroll deduction, so long as (1) their appointment extends through the end of a quarter, (2) their appointment is at a fixed percentage, (3) their salary is at least equal to the fee amount, and (4) their fees are not paid by the RA Tuition/Fee Remission Program.

Eligible students should bring a copy of their signed employment form and completed

application papers for this program to the Office of Graduate Studies and Research five to six weeks in advance of fee payment deadlines.

Students who have a research assistantship and are eligible for RA tuition and fee remission will receive credit on the billing statement.

6. Proceed as indicated to obtain validation of registration as follows:

New Students who do not have a photo-ID card at the time they pay fees should go to the Campus Card Services Office, 508 University Center, and a card will be produced. The card may be picked up at the Cashier's Office where the validation sticker will be affixed.

Continuing Students paying fees in person should present their photo-ID card at the time of payment and the cashier will affix the validation sticker for the current quarter to the back of the photo-ID card.

7. Make all necessary changes (additions and deletions) to the Class Confirmation Card, using add/drop cards, before the end of the second week of the quarter to avoid penalties. **Full-time graduate study requires enrollment in a minimum of twelve units each quarter.**

8. Return the Student Information Card to Office of the Registrar *only* if corrections are necessary in the printed information.

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 Fs or Us 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 "Undergraduate Registration" portion of this catalog or to the quarterly *Schedule of Classes* for additional information.

Additionally, a \$50 late enrollment fee will be assessed students who do not enroll in classes prior to the end of the second week of instruction.

A student who has not completed registration (enrolled and paid fees) by the registrar's deadline date **must petition for permission to register late and will pay late fees totalling \$100.**

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 ap-

proval 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 research assistants, 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.

LEAVE OF ABSENCE/ EXTENSION

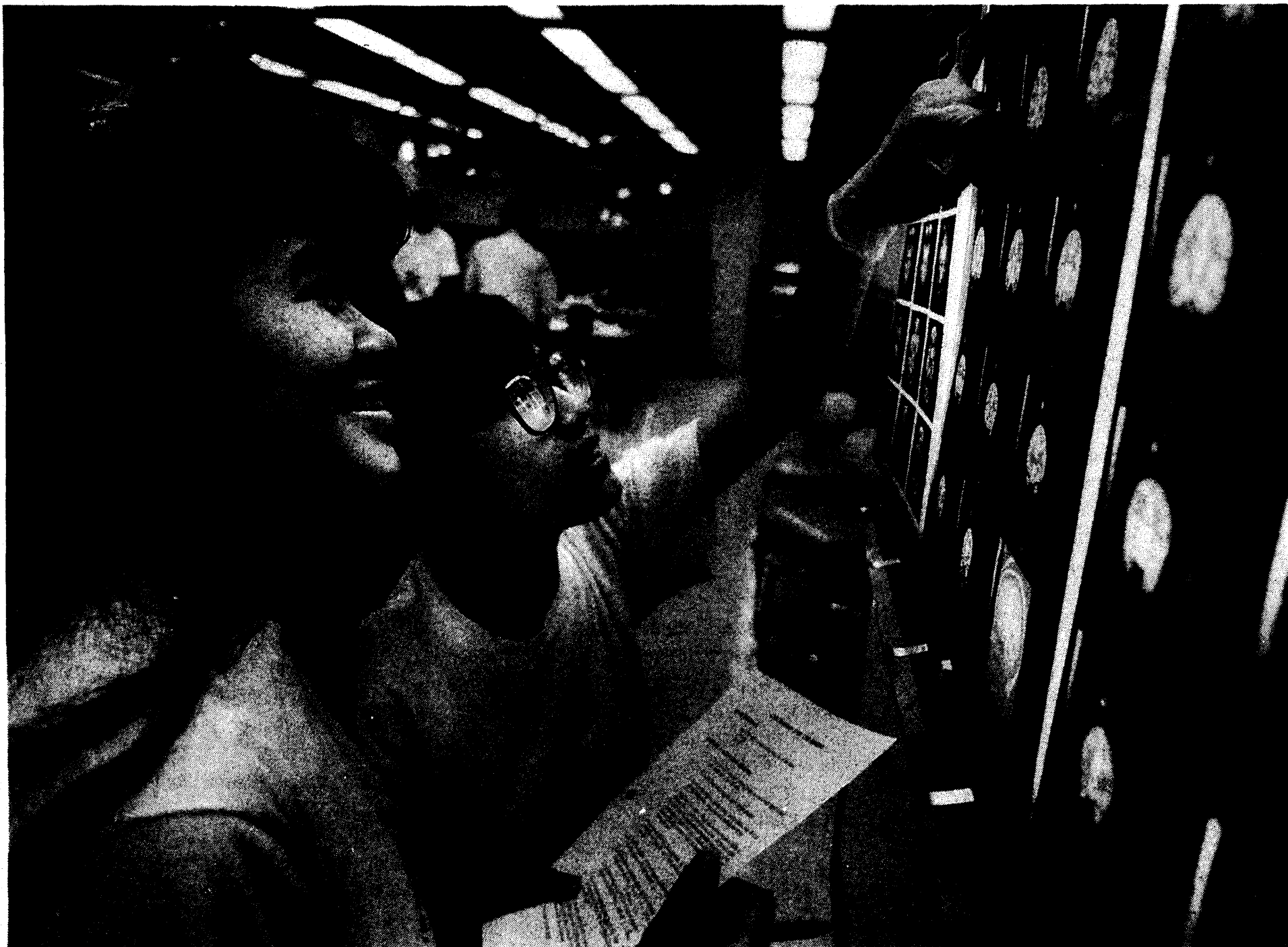
A student who discontinues graduate study with the intention of resuming during a later quarter files a formal Leave of Absence, Extension and/or Withdrawal form prior to leaving the campus. Graduate students must have completed at least one quarter of academic residence and be in good standing (GPA 3.0 minimum 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. 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.

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, Revelle College Provost's Office, Mail Code 0321, (619) 534-3490

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

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

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

Fifth, 412 University Center, Mail Code 0069, (619) 534-2235

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
534-4050

Academic Computing Services provides a wide range of computer services to support instruction, research, and administration, and provides administrative data to academic departments. Site licensed software for minicomputers, workstations, and personal computers is distributed by the User Services group. Instruction and research computing is done on networked minicomputers, desktops, workstations, and personal computers using UNIX, MS-DOS, Macintosh, and VMS operating systems.

With these systems, students and researchers have access to a wide variety of computer languages, application packages, windowing environments, statistical procedures, and mathematical libraries. Graphics facilities include black-and-white and color workstations, interactive graphics terminals, four-color hardcopy plotting, a color printer, and laser printers. Text formatting programs are available for term papers, thesis production, journal articles, and books.

Students access the minicomputers by using interactive terminals located in terminal rooms, laboratories, libraries, and private offices around campus. Impact and laser printers in the terminal rooms are networked so that users can direct output to a nearby printer. Dial-in telephone lines are available for off-campus use of the minicomputers and for data transfers from personal computers. Each system has an on-line documentation program which gives keyed access to descriptions of the programs and facilities available on that system. The computer systems are accessible twenty-four hours a day, seven days a week.

From time to time the Computing Center hires students as part-time operators, technicians, coders, and consulting aides. These jobs are posted in the Student Employment Office.

EDUCATION ABROAD PROGRAM (EAP)

International Center (corner of Hutchison Way and Gilman Drive)

Mail code 0018
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.

EDUCATION AT HOME PROGRAM (EHP)

The Education at Home Program, coordinated by the Riverside campus, provides a unique educational opportunity for UCSD students who have a special interest in early American history and culture. Successful applicants spend nine weeks in Williamsburg, Va., one in Philadelphia, and a concluding week in Washington, D.C. The EHP is open to all UCSD undergraduates. Graduate students may apply with prior approval of their graduate adviser. Registration (as an "Intercampus Visitor" to the Riverside campus) will be made for three upper-division history courses listed in the Riverside catalog as History 157, 158, and 159. The EHP is normally available winter quarter each year. For further information and application forms, contact your college academic advising office. For more information call Susan Braddock in the Department of History at the Riverside campus at (714) 787-3820.

FOREIGN SCHOLAR ADVISER

International Center (corner of Hutchison Way and Gilman Drive)
Mail code 0018
534-3730

The foreign scholar adviser provides assistance to UCSD's foreign faculty, researchers, and postdoctoral 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 foreign visitors. The Friends of the International Center provide additional hospitality services and programs to foreign scholars and their family members.

FOREIGN STUDENT ADVISER

International Center (corner of Hutchison Way and Gilman Drive)
Mail code 0018
534-3730

The foreign student adviser provides assistance to UCSD's nonimmigrant undergraduate and graduate foreign students, including advising on immigration, financial, health, and personal matters. The foreign 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)

OASIS Main Office
Galbraith Hall
Room 1058
Mail code 0336
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.

GOALS

OASIS provides activities that support and contribute to the improvement of teaching and learning. Programs range from services to help students overcome past academic deficiencies to programs to help them excel in a subject matter or skill. Services also are provided to faculty interested in improving aspects of their teaching, and to faculty and staff

interested in assistance with evaluation or research projects.

ELIGIBILITY FOR SERVICES

All students in any of the five colleges are eligible for OASIS programs. Classes are non-credit and may be repeated. Course titles and schedules are printed in the *Schedule of Classes* and campus media. Student services are available in six locations: the Underground, the Second Story, the Third Place, the Warren Academic Services Center, Muir Residence Halls, and the OASIS Main Office.

The Academic Transition Program (ATP)

ATP coordinates services to all Educational Opportunity Program/ Student Affirmative Action (EOP/SAA) freshman students and provides professional and peer counseling including in-depth interviews, analysis of academic background, and goal setting which lead to an individualized program for each student.

In addition, ATP coordinates a four-week residential Summer Bridge Program for entering EOP/SAA freshmen. Students attend classes in mathematics, science, writing, and reading. A variety of cultural and personal development sessions are coordinated with these academic programs to orient students to college and provide a smooth transition from high school to UCSD.

OASIS Main Office, extension 43760
Galbraith Hall, Room 1058

The B.C. (Before Calculus) Program

The OASIS B.C. Program is designed to support students in their desire to excel in the pre-calculus sequence and to build a strong foundation for the calculus sequence. As a program participant, the student will be working and studying regularly with other students. The program offers pre-calculus workshops for Community College Math. 140 and Math. 4C as well as workshops in UCSD's Math 1A-C.

OASIS Main Office, extension 43760
Galbraith Hall, Room 1058

The Study Management Center

The Study Management Center offers mini-courses, study skills workshops, and one-to-one conferences. The center offers GRE, MCAT, and LSAT Preparation Courses which provide test-taking practice and strategies. Study Skills Workshops are also scheduled throughout the

quarter on such topics as time management, textbook reading, concentration, memory, and test preparation. Finally, students may enhance all of their skills through PAL (Personal Assistance for Learning) conferences with a learning specialist. PAL conferences focus on the learning tasks, texts, and issues related to the student's specific course work. All of the workshop topics plus goal setting, procrastination, and stress management can be handled in these sessions.

OASIS Second Story, extension 47344
York Hall, 4010

Research and Evaluation Program

Administered jointly by the Office of the Assistant Vice Chancellor for Academic Services and OASIS, the Research and Evaluation program operates the OASIS Data Base.

Research projects examine a particular problem or issue related to OASIS services and have included studies of the relationship between high school quality and UCSD academic performance, the enrollment of women and minority students in majors requiring mathematics, the relationship between spatial and verbal aptitudes and self-instructional materials, and the effect of self-control techniques on test performance in calculus and chemistry. In addition, longitudinal studies of the effect of services on student users are undertaken, such as follow-up studies on the retention of Academic Success Program and Summer Bridge students.

Evaluation activities that are essential to the provision of effective services to students are also the responsibility of this program. All OASIS programs are evaluated each quarter, and results are used to make improvements in service for the following quarter as well as for long-range planning. Evaluation projects include study of the characteristics of students served, type of service provided, student opinion of services, and outcomes of service.

Research and evaluation reports are printed, bound, and distributed to interested persons or groups. These reports also provide much of the information necessary for various funding sources.

TEP 196 – The Psychology of Teaching

The director of OASIS teaches a four-unit, upper-division course that provides instruction to all OASIS student staff members—tutors, peer counselors, and study skills counselors—on the teaching-learning process. The

course is designed to balance lectures and readings with supervised, practical experience.

*OASIS Main Office, extension 43760
Galbraith Hall, Room 1058*

OASIS Satellite Offices

The Third Place provides services to all Third College and EOP/SAA students. Professional and peer counselors assist in all areas with adjustment to university life. In addition, there are tutors in writing, study skills, lower-division math, physics, chemistry, economics, biology, and computer science.

The Warren Academic Services Center, operated jointly with Warren College academic advising, offers tutoring and peer counseling, as well as selected workshops and study groups.

The Third Place, extension 43284

102 Third College Commons

Warren Academic Services Center, extension 46030

Warren College Apartments Bldg. 2, Apt. 2110

Tutorial Programs

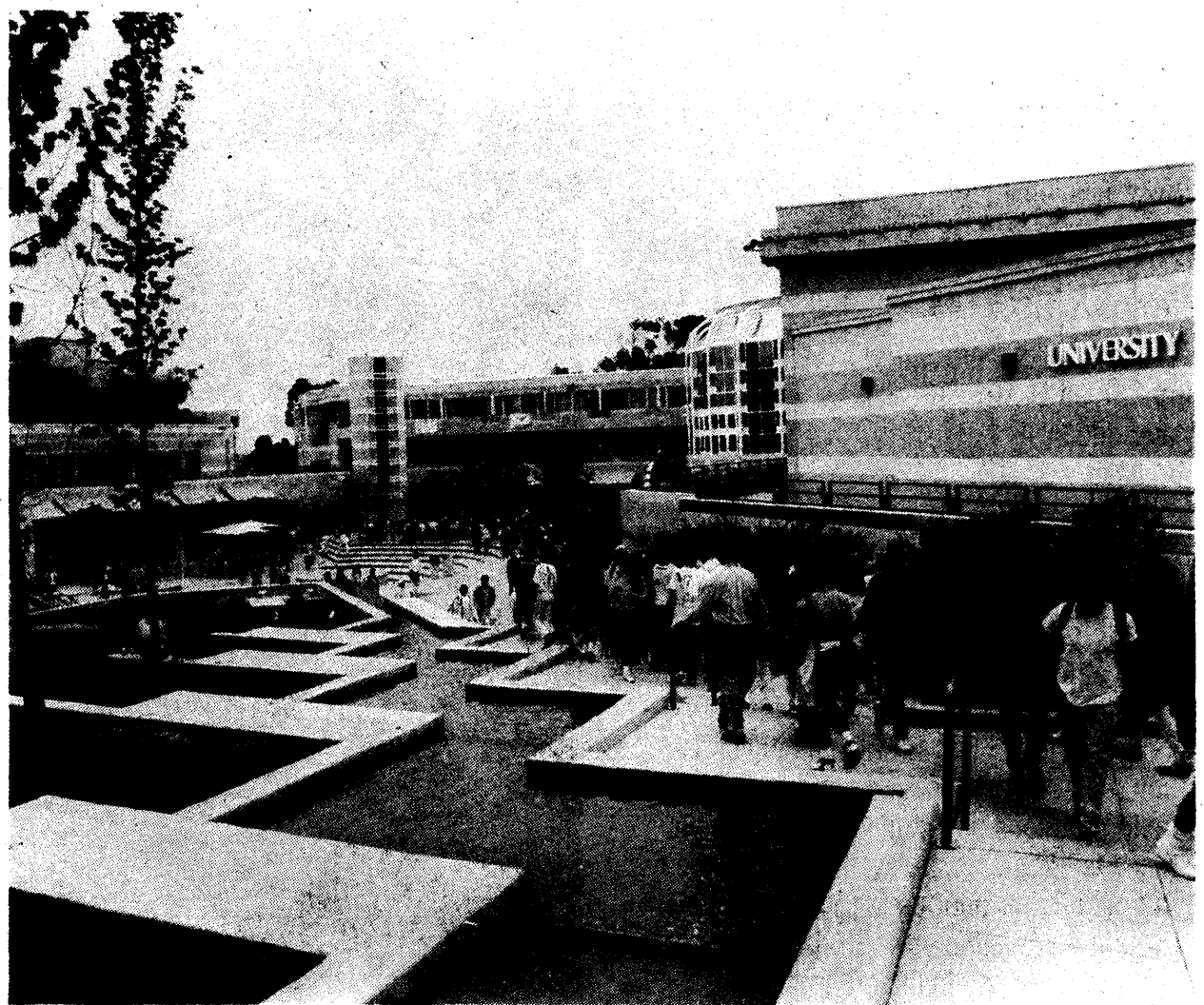
OASIS provides free tutoring in lower-division biology, chemistry, physics, mathematics, economics, and computer science. Tutors are available on a drop-in basis to help the student become an independent learner. Most of the tutorial services are located in the Underground but are also available at the Third Place, the Warren Academic Services Center, and Muir Dorms. Tutors often arrange to hold group sessions in various locations throughout the campus. All tutors are required to complete TEP 196, The Psychology of Teaching, concurrent with their first quarter as tutors.

The Underground, extension 42280

Galbraith Hall, Room 1254

Writing Center

At the Writing Center students 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 prewriting preparation, revision, and editing strategies. Small group sessions address special needs, for example, research writing, editing, and writing English as a second language. The Grammar Moses telephone hotline offers phone-in service for



help with diction, grammar, mechanics, and spelling.

OASIS Writing Center, extension 42284

Student Center, Bldg. A, Room 214

The Language Program

Students whose first language is not English are helped in the Language Program (LP). In addition, students doing academic, class related work in Spanish, French, Italian, and other foreign languages can participate in LP Workshops conducted by bilingual staff. The OASIS Language Program services include the Language Program Class, a biweekly intensive reading and writing class; weekly fifty-minute workshops on grammar and mechanics; weekly fifty-minute workshops in Spanish, French and other languages; practice of the English language for foreign students; and individual conferences where feedback on drafts of writing in the languages is provided.

OASIS Language Program, extension 42284

Student Center Bldg. A, Room 214

The Scholars' Writing Workshop

Students who are committed to achieving academic excellence as writers and who wish intensive, individualized help and group feed-

back on written assignments can participate in the Scholars' Writing Workshop. Services include weekly workshops and individual conferences.

OASIS Second Story, extension 47344

York Hall, Room 4070

OFFICE OF INTERNATIONAL EDUCATION

International Center
(corner of Hutchison Way and Gilman Drive)
Mail code 0018
534-3730

The International Center houses the offices of the foreign 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 foreign 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



CAMPUS SERVICES AND FACILITIES.

services for all members of the UCSD community. These include lectures, language exchanges, linkages with international faculty specialists, and weekly international café lunches which are open to the entire campus.

OPPORTUNITIES ABROAD PROGRAM (OAP)

International Center (corner of Hutchison Way and Gilman Drive)
Mail code 0018
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 nonacademic 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
534-5000

The San Diego Supercomputer Center (SDSC) is a national resource established to advance scientific research and enhance U.S. industrial competitiveness through the effective application of high-performance computational technologies and techniques to basic and applied research projects. SDSC meets these goals by:

- Making supercomputer and visualization resources available to some 3,000 researchers, students, and teachers working on hundreds of projects in every state in the country.
- Training these users to apply the resources efficiently and developing undergraduate and K-12 curricula to further disseminate computational expertise.



- Providing expert user support.
- Supporting joint research collaborations between SDSC staff and outside researchers.
- Developing next-generation technology through research projects to develop parallel processing systems and scientific visualization software; analyze and implement high-speed communications; and support computational biology.

SDSC was established in 1985 at the University of California, San Diego with major funding from the National Science Foundation. Additional funding is provided by the state of California, the University of California, and a number of industrial partners. SDSC is operated by General Atomics, a high-technology R&D company.

EMPHASIS ON PARALLEL PROCESSING, VISUALIZATION, AND NETWORKING

SDSC and UCSD launched a parallel computing initiative in 1990 with support from NSF, DARPA, DOE, Intel, and nCUBE. SDSC staff have developed critical systems software, including job scheduling, resource management, and accounting software, and have implemented several biology and chemistry codes on the parallel computers. UCSD faculty and students are using the parallel computers

in computer science classes and for research in several departments.

SDSC staff have developed several tools to facilitate remote use of the center's visualization resources: a suite of programs to read, write, and manipulate raster images; an easy-to-use toolset to produce a variety of hardcopy output; and a hypermedia Macintosh-based guide to understanding computer color concepts.

Research to study Grand Challenge problems (fundamental problems in science and engineering with broad economic or societal impact such as climate change, air pollution, AIDS, and earthquake engineering), in addition to demanding high-performance computers, needs ever greater network capacities and speeds to handle the movement of information among machines. Accordingly, SDSC conducts leading-edge research in network performance analysis and is developing network-monitoring and -measurement tools and a gigabit-per-second network prototype to connect geographically dispersed supercomputers. SDSC's nationally recognized network staff provides leadership in local, national, and international computer network activities, and in particular, is providing engineering support for the National Research and Education Network (NREN) effort.

HIGH-PERFORMANCE COMPUTING ENVIRONMENT

The major computing resource at SDSC is a CRAY Y-MP8/864 supercomputer from Cray Research, Inc. The CRAY runs UNICOS (a version of the UNIX operating system) and features 8 CPUs (delivering about 60,000 CPU hours per year to users), 512 MBytes of memory, and a 6-nanosecond clock cycle with a peak speed of 2.7 Gflops. The configuration also includes 82 GBytes of disk space and a 256-MWord Solid-state Storage Device (SSD).

UCSD has access to a 400-node Intel Paragon parallel supercomputer at SDSC. The Paragon has a peak speed of 40 Gflops for 32-bit arithmetic. The total memory is 7.25 GBytes; 336 nodes have 16 MBytes of memory each, while the remaining 64 nodes have 32 MBytes each. SDSC also has a 128-node nCUBE 2 parallel computer with a peak speed of 390 Mflops, again for 32-bit arithmetic. The total nCUBE memory is 1.25 GBytes; half of the nodes have 16 MBytes of memory each, and the other half have 4 MBytes each.

The archival storage system at SDSC available to both CRAY and parallel users provides 95 GBytes of disk space and over 2.5 TBytes of cartridge tape for long-term file storage. User access is provided via the dti (Data Tree Interface) utility.

SDSC's Advanced Scientific Visualization Laboratory (VisLab), funded primarily by the state of California, is the center for visualization research, development, and applications use at SDSC. High-end graphics workstations and a variety of hardcopy output formats give researchers many choices for visualizing their results. A full-featured audio/video post-production suite is available to edit computer graphics animations, add background narration or music, and record them on high-quality videotape.

USER INFORMATION AND SUPPORT

SDSC provides expert user support. Documentation, individual consulting assistance, and workshops are important components of this effort. Classes, conducted onsite and at specially arranged locations, give users hands-on experience with the major aspects of computing at SDSC, code optimization, scientific visualization, and parallel computing. SDSC also holds a two-week, hands-on advanced computing institute each August and encourages students to apply for admission.

OPPORTUNITIES FOR STUDENTS

SDSC staff members teach classes at UCSD (including Extension) and SDSU to familiarize graduate students, undergraduates, industry, and the public with various aspects of high-performance computing. Many of these classes give students accounts on SDSC computers and access to the VisLab. Look for those courses through the AMES, CSE, ECE, science, and math departments. You can gain admission to these classes through normal university enrollment procedures.

SDSC hosts NSF's Research Experience for Undergraduates (REU) program, which introduces undergraduates (primarily juniors and seniors) to research in computational science. Working under the guidance of UCSD and SDSU advisers, students can participate in a two-month program during the summer or a special part-time REU program in visualization during the academic year. Students must apply for and be accepted into the program. Stipends are provided.

Student internships are available for students to work with SDSC staff and receive academic credit. Part-time jobs are also available.

UCSD students are welcome to attend seminars at SDSC. Held once or twice per week, they consist of presentations by SDSC staff, UCSD faculty and students, visiting scientists, hardware and software vendors, or others on scientific and technical topics of interest to the high-performance computing and communications community. These seminars are publicized through departmental electronic bulletin boards.

SDSC offers a forty-five-minute tour at 4:00 p.m. every Friday. The tour provides an overview of SDSC, its supercomputers, scientific research and software development projects, and training programs. Reservations are recommended. To sign up, contact the SDSC receptionist at 534-5000. More specialized tours of SDSC are also available by request.

For more information about the center, contact the SDSC consultants at (619) 534-5100 or by electronic mail to consult@y1.sdsc.edu.

EXTENDED STUDIES AND PUBLIC SERVICE PROGRAMS

9600 North Torrey Pines Road
(on the UCSD campus north of Muir College)
Mail code 0176
534-3400

The Division of Extended Studies and Public Service is an academic activity of the University of California which serves the educational needs and lifelong learning interests of adults in the San Diego community. The division provides advanced learning opportunities for educated and professional people, including courses, seminars, workshops, institutes, conferences, and study tours. Annual enrollment is approximately 45,000 in the various programs administered through Extended Studies and Public Service. 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 Service, phone 534-3400 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, management, hazardous materials management, legal education, marketing communications, systems programming, personnel, real estate, emergency department nursing, alcohol studies, and fitness instruction. State-approved credential programs for educators, quarterly engineering colloquia, a career planning program, and course sequence awards in business, science, engineering, and computer science specializations 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" and the "Leadership and Management Program for Scientists and Engineers." 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 designed to meet the needs of a national as well as local business constituency such as the annual "Securities Regulation Institute."

ADVANCED TRAINING FOR EDUCATORS

State-approved credential programs for teachers offered by UCSD Extension include adult education, community college instruction, special education, and pupil personnel services, to name just a few. 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

CAMPUS SERVICES AND FACILITIES

Enhancement in Science and Technology (PTEST), funded by NSF, and Project COPE (Change on Planet Earth), co-sponsored with Scripps Institution 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 the program director, 534-6114.

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, 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.

INTERNATIONAL STUDIES AND LANGUAGE PROGRAMS

UCSD Extension offers a variety of English programs for individuals for whom English is not the native language. The Intensive English

Language Program is taught at six academic levels with electives such as advanced grammar, TOEFL preparation, American history, and business and scientific English. It is offered throughout the year at ten-week intervals. In addition, short courses in conversation are offered during the winter and summer (and at other times by special contract) for international visitors and students who wish to improve their ability to understand and communicate in English.

In addition, an innovative series of courses in English for Bilingual Professionals, leading to a certificate, offers bilingual managers, business owners, and professionals a means to advancement in our English-oriented society.

A wide variety of language programs for English speakers such as Spanish and Korean are offered year-round.

HEALTH MANAGEMENT

In the 1990s, health will be a critical issue, from the economic and sociological as well as medical perspectives. UCSD Extension offers advanced and continuing education courses for health professionals, and a beginning and advanced Certificate Program in Fitness Instruction/Health Management.

In addition the Program on Alcohol Issues is designed to contribute to a broader public understanding of alcohol problems and the avoidance of their adverse consequences. Pro-

gram offerings include national conferences, professional development courses, and the annual Summer School of Alcohol and Other Drug Studies.

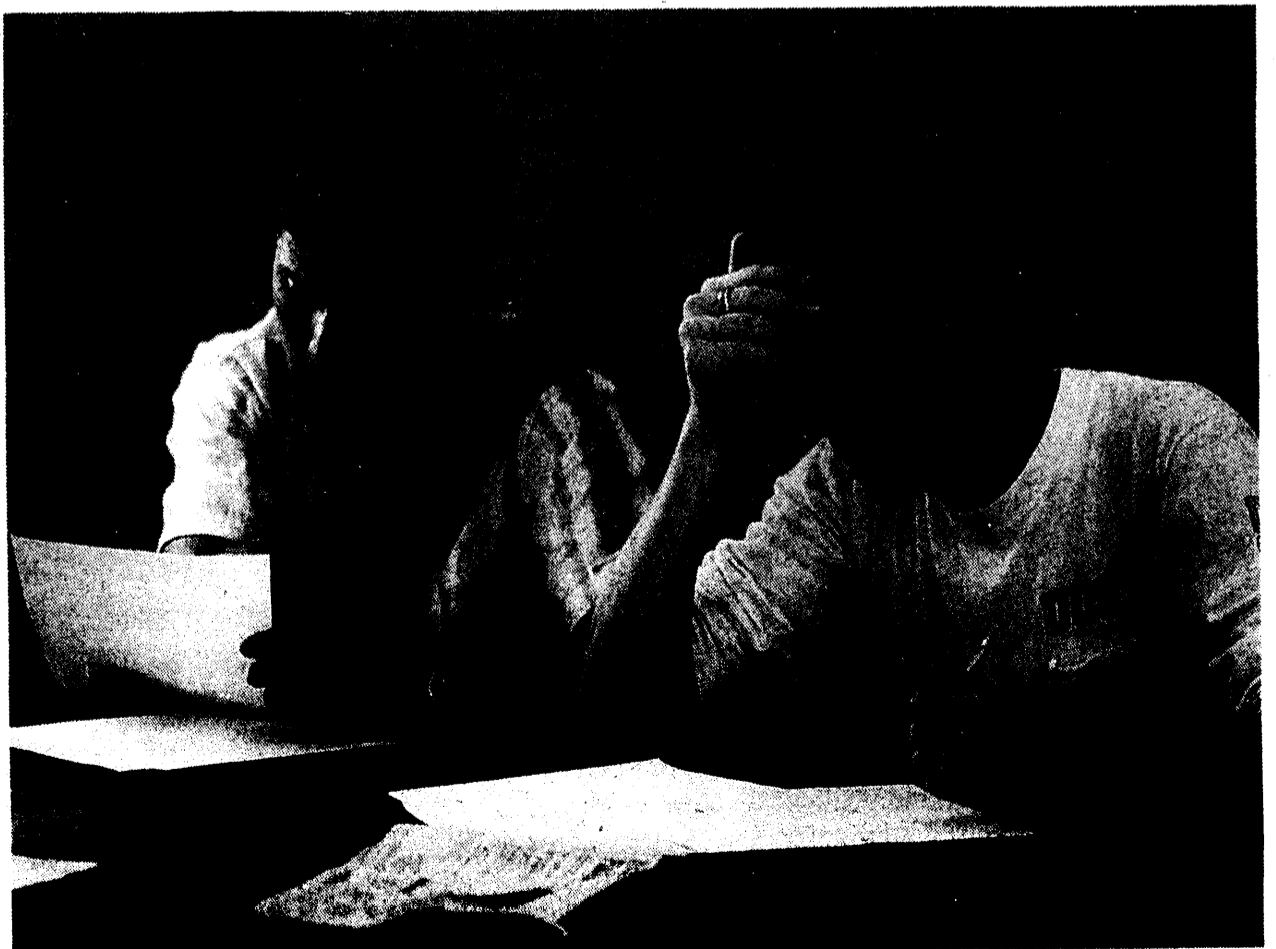
LEGAL ASSISTANT TRAINING PROGRAM

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 which 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.

A reciprocal arrangement allows matriculated UCSD students to enroll in UCSD Extension courses free of charge. Undergraduates at UCSD interested in this program should call their provost's office for information; graduate students should contact the Office of Graduate Studies and Research.



**PROGRAMS FOR RETIRED PERSONS:
INSTITUTE FOR CONTINUED LEARNING**

The institute 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 534-3409.

THE UNIVERSITY LIBRARY

The UCSD library consists of the Central University 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, and the Art and Architecture Library.

**COMBINED UCSD LIBRARY STATISTICS,
1991**

Volumes	2,188,722
Periodical and other serial publications received	24,388
Government documents	241,400
Maps	266,282
Microforms	2,193,507
Audio and video materials	62,707
Slides and other pictorial items	237,591

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 ser-

vice is available to all faculty, staff, and students of the university. Our students enjoy direct borrowing privileges at the other UC campuses.

The Computer Assisted Reference Service assists readers in the compilation of subject bibliographies. This process not only saves readers the time of manually searching periodical abstracts and indexes, but also permits more thorough searching of data bases such as Biological Abstracts, Dissertation Abstracts, and Psychological Abstracts. Contact the reference departments of the Central University Library or any science library for information about this service. Access to ROGER, the online catalog of the UCSD Library, and Melvyl, the UC online union catalog, is available through the campus network. The library also operates Infopath, the campuswide information system that provides access to ROGER, Melvyl, and many other electronic databases and services located at UCSD and throughout the world.

Library hours of service vary and are regularly posted. Most units extend hours during examination periods.

NOTE: Call 534-3837 for an up-to-date schedule of open hours for all libraries (recorded message).

CENTRAL UNIVERSITY LIBRARY

(located west of Warren College and east of Third College)
Mail code 0175R
534-3336

The Central University Library houses the research collections in the social sciences, humanities, and fine arts (1,445,525 vols.). Its Research Services Department 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. A listening facility in the Music Library serves music instruction and research. The Mandeville Department of Special Collections includes rare books, manuscripts, and other research materials. Special Collections' resources include materials about Baja California, Pacific Voyages, the Spanish Civil War, science and public policy, and modern poetry.

SCIENCE AND ENGINEERING LIBRARY

Adjacent to the Central University Library
Mail code 0175E
534-3258

The Science and Engineering Library contains strong collections in the physical sciences and technology (185,762 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

Basic Science Building, School of Medicine
Mail code 0175B
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 (187,723 vols.). A branch library, the Medical Center Library (24,384 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

Mail code 0175W
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 (37,834 vols.).

SCRIPPS INSTITUTION OF OCEANOGRAPHY LIBRARY

Mail code 0175C
534-3274

Scripps Institution of Oceanography Library is one of the largest marine science libraries in the world (226,824 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
534-3065



CAMPUS SERVICES AND FACILITIES

Undergraduate Library has a general collection (80,377 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 (2,256 audio; 835 video) and reserve materials used by faculty in their classes.

ART AND ARCHITECTURE LIBRARY

Central University Library
Mail code 0175F
534-4811

The Art and Architecture Library's collections support the study of the visual arts and architecture (50,000 vols.; 180,000 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.

STUDENT SERVICES AND PROGRAMS

VICE CHANCELLOR, STUDENT AFFAIRS

Building 112 University Center
Mail code 0015
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
534-3750

PURPOSE AND OBJECTIVES

The Career Services Center exists to help UCSD students and alumni determine and fulfill their career goals. Thus, it offers a wide range of services related to employment and graduate education. Although sometimes over-

lapping, these services are divided into the following three program areas:

1. **Part-time Employment**—programs which help students obtain part-time, temporary, and summer employment;
2. **Career Advising**—programs which help students identify and pursue career goals;
3. **Professional/Graduate School Advising**—programs which help students identify and seek admission to professional/graduate schools.

SERVICES AND PROGRAMS

Career Services Center programs are provided in a variety of forms including drop-in advising, individual appointments, workshops, special events, and informational resources. Examples of services in each of the three program areas are outlined below:

1. **Part-time Employment (for UC Students)**
 - a. *Job Listings*—On- and off-campus job vacancies
 - b. *Student Corps Services*—Temporary on-campus employment through campus departments
 - c. *Co-ops/Internships*—Paid, preprofessional employment experiences
 - d. *Special Assistance*—Individual help in finding desirable part-time employment
2. **Career Advising**
 - a. *Career Planning*—Career decision-making workshops, SIGI (computerized planning tool), panel presentations, career fair, career survey, career consultants
 - b. *Job Search Preparation*—résumé writing, interviewing, and job search strategy workshops. Video-taped mock interviews, résumé preparation software
 - c. *Job Seeking*—On-campus interviews, job search clubs, listings, MENTOR, job fairs
 - d. *Special Assistance*—Individual assistance with career concerns and informational resources related to occupational research and employer identification

3. **Professional/Graduate Advising**

- a. *Decision Making*—Directories, panel presentations, fairs, catalogs, individual advising
- b. *Admission Preparation*—Applications for admissions tests, application essay assistance, interview preparation, group information sessions

- c. *Reference Files*—method to collect and distribute letters of reference

- d. *Special Assistance*—Individual assistance with career concerns related to professional and graduate school admission

Details about these programs are available at the Career Services Center.

COLLEGE DEANS' OFFICES

Revelle, Mail code 0321, 534-3492
Muir, Mail code 0106, 534-3587
Third, Mail code 0509, 534-4390
Warren, Mail code 0022, 534-4731
Fifth, Mail code 0069, 534-2237

The staffs of the college deans' offices perform many different functions. They provide help, advice, counseling, and referral in many areas. The deans' offices regularly design and coordinate activities such as orientation, Welcome Week, commencement, decisions about remaining in or withdrawing from school, counseling on legal problems, 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 aid you with your problem or concern.

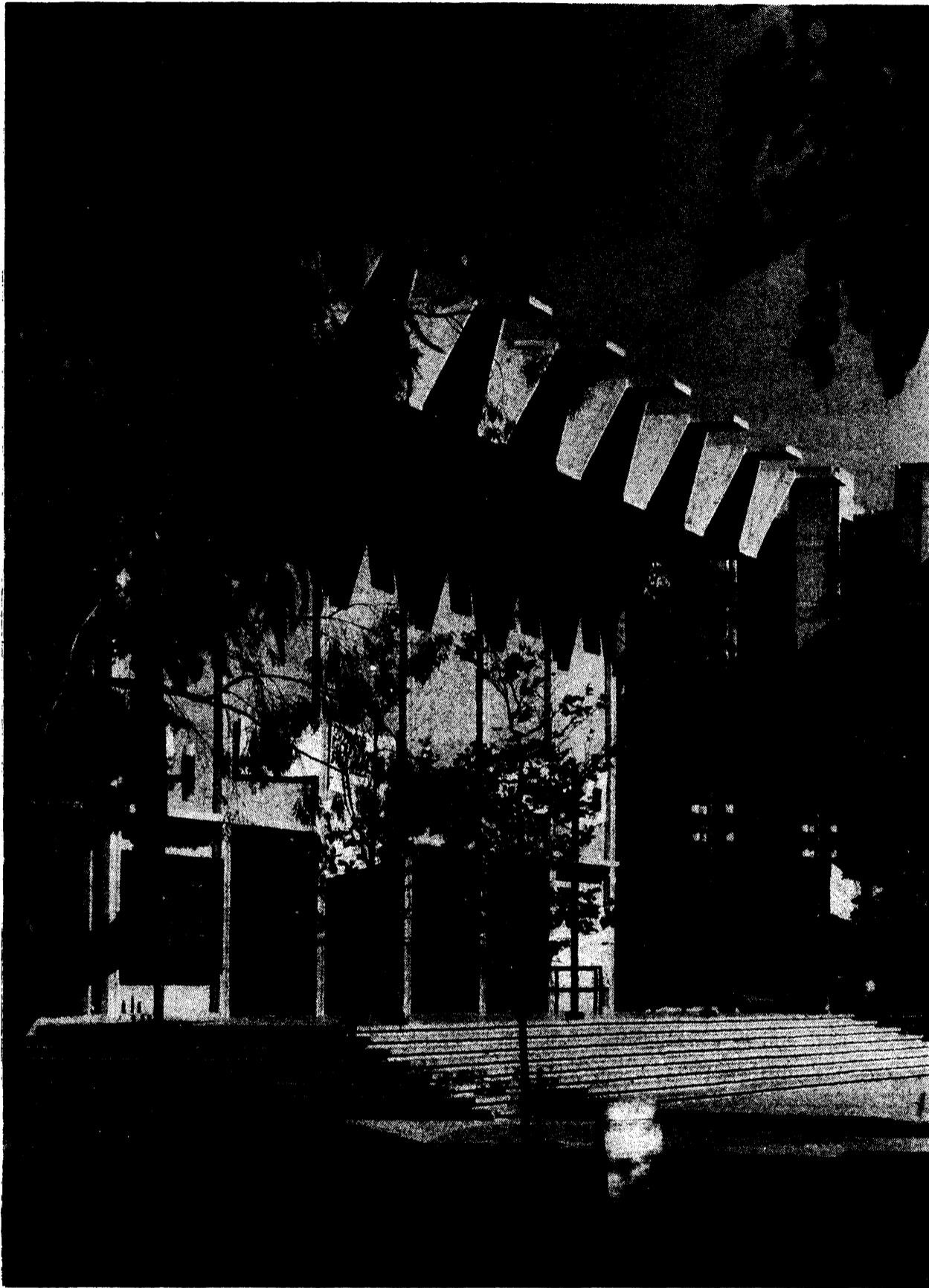
COMMUTER STUDENT SERVICES OFFICE

Building B, Student Center
Mail code 0309
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.

DINING SERVICES

Administration: Muir Commons Annex
Mail Code 0122
534-4013

A wide variety of foods in various distinctive settings is available on campus. Cafeterias and restaurants are conveniently located close to the residence halls throughout campus. Additionally, there are restaurants located adjacent to the School of Medicine, Third College, Revelle College, Muir College, Warren College, and Scripps Institution of Oceanography. Students and the public may eat at any of these facilities, and hours will vary depending on locations.

For students living in the residence halls, a board plan is mandatory; it is optional for apartment residents. Residence hall students may choose among six different board plans. For the cost of these plans, please refer to the "Housing" section below.

Campus dining services also offer several meal plans to commuters and apartment residents on a quarterly basis, at a cost based on the board rate. Some apartment residents prefer to do their own cooking; those choosing a board plan usually select one of the Plus board plans or a Plus Card declining balance account.

Resident students will use their campus I.D. card for meal plan identification, entitling them to eat in any of the full-service cafeterias or many restaurants located around campus.



Each restaurant has its own unique atmosphere, and menu items differ from one location to another.

Other food service facilities include six fast-food restaurants and a convenience store located in the Price Center, the Food Co-op and Grove Caffe, located in the Student Center; and the Ché Cafe located on Revelle campus. Also available for a limited selection of food stuffs are portable food carts, convenience stores, and a variety of vending machines located in key traffic locations throughout all the campuses.

DISABLED STUDENT SERVICES

Building 204 University Center
Mail code 0019
534-4382/534-2494 (TDD)*
*(Telephone for the deaf ONLY)

The primary objective of the Office of Disabled Student Services (DSS) is to integrate and mainstream students with disabilities into general campus programs and activities. The ability of each disabled student to function independently in the educational environment is the ultimate goal.

The following services are available to meet the individual needs of disabled students:

1. **Disability Management Advising**
2. **Academic Support Coordination:** readers, interpreters, notetakers, lab/library assistants, typists.
3. **Special Equipment Loan Service:** manual wheelchairs, powered wheelchairs, cassette recorders, talking calculators, color print enlargers, telecommunication phone devices for the deaf, audio assistive devices, and other adaptive equipment for students with disabilities are available for loan at DSS.
4. **Equipment Repair Service:** Minor repairs to wheelchairs and other mobility-related equipment are available at Disabled Student Services by appointment. Appointments are not necessary in emergency situations.
5. **On-Campus Transportation:** Disabled Student Services operates a prior-scheduled on-campus transportation system for students with permanent and temporary disabilities. Prior-scheduled pick-up times can be reserved by disabled students from 8:45 a.m. to 4:00 p.m., Monday through Friday, for on-campus transportation needs. On-call transportation requests can be made with twenty-four-hour notice, but on-call transportation services will

be provided only after all prior-scheduled pick-ups have been completed. The Transportation Alternatives Office schedules a lift-equipped van to meet the on-campus transportation needs of disabled students after 4:00 p.m. To schedule the van, contact Transportation Alternatives at 534-4235 during office hours. (Note: No transportation is provided on the weekends or during the summer.)

6. **Parking Coordination**
7. **On-Campus Housing Coordination**
8. **Priority Enrollment Coordination**
9. **Test-Taking Arrangements**
10. **Resource Library**
11. **Liaison with the California State Department of Rehabilitation**
12. **Referrals to Resources, Services, and Agencies**

Documentation of disability will be required for the delivery of services.

FINANCIAL AID

STUDENT FINANCIAL SERVICES

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

The University of California, San Diego expects students and their families to bear as much of the basic, necessary costs of the student's education as their circumstances will allow. In those cases where family resources are insufficient to meet the basic educational costs, the Student Financial Services Office will attempt to assist students in obtaining supplemental support and financial aid. Students who are nonresidents of California should note that financial aid funds are not sufficient to meet the additional cost of non-resident tuition (\$7,699 during 1992-93). The family should be prepared to provide this amount from its own personal resources or educational loan programs that may be available for all or part of these costs.

The Student Financial Services Office is divided into six separate financial aid offices—one for each of the undergraduate colleges and one for the graduate division. (The School of Medicine financial aid office is housed in the medical school.) The Student Financial Ser-

vices Office also includes the scholarship office and the office of veterans' affairs. The purpose of this structure is to serve more efficiently the needs of the students who require financial assistance, scholarship information, and veterans' benefits certification services while attending UCSD. Locations and telephone numbers are listed below.

Fifth College, 204 University Center
(619) 534-2550

Muir College, 210 University Center
534-3808

Revelle College, 213 University Center
(north entrance) 534-3806

Third College, 213 University Center
(south entrance) 534-3805

Warren College, 214 University Center
(west entrance) 534-4686

Graduate Division, 204 University Center
534-3807

Scholarship Office, 214 University Center
534-3263

School of Medicine, Medical Teaching
Facility 534-4665

Veterans Affairs, 210 University Center
534-4483

Applications and requests for information should be addressed to the appropriate area of the Student Financial Services Office as follows: University of California, San Diego, Attn: (your undergraduate college name or graduate division), Student Financial Services, 0013, 9500 Gilman Drive, La Jolla, California 92093-0013.

No student should leave the university for financial reasons before exploring all possible avenues of assistance with a Student Financial Services counselor. Financial assistance, undergraduate scholarships, loans, grants, and work-study employment, unless otherwise designated, are processed by the Student Financial Services Office. Several publications are available on request from the Student Financial Services Office describing in detail the various financial aid programs and services administered by this office. *All information contained herein is intended to serve as a general guide and is subject to change in conformity with new and revised federal, state, and University of California regulations.*

Undergraduate Scholarships and Fellowships

The purpose of the Undergraduate Scholarship Program at UCSD is to encourage aca-

democratic excellence and to recognize outstanding achievement. Scholarships are awarded to entering and continuing students on a competitive basis. Consideration is given to demonstrated academic ability as evidenced in GPA, math and verbal SAT scores, Achievement Test scores, honors courses, additional a-f courses taken beyond the requirement, scholastic promise, and, in many instances, financial need. Honorary scholarships awarded solely on the basis of academic excellence are Regents Scholarships, Revelle Scholarships, Alumni Scholarships, as well as various other academic achievement scholarships. Several restricted scholarships may also be awarded as honorary. UCSD participates in the National Merit Scholarship Program. In the 1992-93 academic year, 214 university, corporate, and special National Merit Scholars received a total of \$221,233. Students must reapply for undergraduate scholarships each academic year, with the exception of the Regents and the Revelle Scholarships, which are awarded for a two- or four-year term. The Committee on Undergraduate Scholarships and Honors, composed of UCSD faculty members, selects the recipients. Notification of Regents awards and non-need-based scholarship awards (honorary scholarships) starts in March. Notification of need-based awards is made in the Financial Aid Award Letter, which will be mailed beginning in May 1993. Restricted scholars are not notified until September or later. For all scholarships, letters are mailed only to those students selected. We regret we are unable to mail denial notification to other applicants.

Students entering UCSD from high school or another postsecondary institution must complete Section X on the *University of California 1993-94 Undergraduate Application for Admission and Scholarships*. The deadline for submission of the application is November 30, 1992. No supporting documents are required.

Student Financial Services (SFS) will mail 1993-94 scholarship applications to all highly qualified UCSD students. Those who wish to apply for scholarships, but did not receive an application in the mail, should obtain one from SFS. Prior students planning to be readmitted to UCSD during 1993-94 should request an application from SFS. The deadline for submission of the scholarship application is February 19, 1993.

Current UCSD Early Admissions Honors (EAH) students will be mailed a scholarship application. It should be returned directly to

the EAH Coordinator (0337, UCSD) by the February 19, 1993, deadline.

If you plan to file the *University of California 1993-94 Application for Admission* winter or spring quarter and wish to be considered for 1994 UCSD scholarships, you must request a scholarship packet from the Student Financial Services Office in December 1992. The deadline for submission of the scholarship application is February 19, 1993.

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 scores, Achievement Test scores, honors courses, and additional a-f courses taken beyond the requirement. The actual GPAs of entering students selected as Regents Scholars in 1992-93 ranged from 3.90 to 4.45 with a mean of 4.19, while the median of the combined SAT scores totaled 1410. Continuing UCSD students who were offered the Regents Scholarship averaged a 3.95 UC GPA in 1992-93. 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. Regents Scholars who do not submit financial data or who are determined not to have financial need, receive a \$500 honorarium during each year of appointment. Additionally, in the initial year of appointment only, entering 1992-93 Regents Scholars were considered for a second one-year scholarship based on their academic achievement. Foreign 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. This basic cost is estab-

lished each year by Student Financial Services and includes required fees and tuition, books and supplies, room and board, personal and transportation expenses. During 1992-93, Regents Scholarship awards ranged from \$500 to \$15,824.

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 transcript annotation (Regents only), 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 up to four years.

University Scholarships

The University of California has provided this scholarship fund to assist outstanding needy students meet the cost of attending UCSD. Selection is based on academic record, promise, and financial need. Awards may range up to \$1,000 per academic year.

Alumni Scholarships

The UCSD Alumni Association provides one-year scholarships to recognize outstanding students and to assist with the cost of attending UCSD. These awards are based on academic and personal achievement, and future promise. Alumni awards do not consider financial need, as they are honorary scholarships. For the 1992-93 academic year, the recipients received scholarships for the full cost of California resident UC registration fees.

Scholarships for National Merit Finalists

UCSD has offered college-sponsored scholarships to some National Merit finalists who attended UCSD and whose National Merit awards were not funded by corporate donors. Annual awards ranged from a \$500 honorarium to a \$2,000 need-based stipend. Additionally, in the initial year of appointment

only, entering corporate-sponsored 1992-93 National Merit scholars were considered for a second one-year scholarship based on their academic achievement. Refer to the "Regents Scholarships" section for a listing of the UCSD privileges accorded National Merit winners.

President's Undergraduate Fellowship Program (PUF)

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. Winners, who must be enrolled throughout 1993-94, are awarded a need-based stipend, determined by the cost of the project.

David Jay Gambee Memorial Fellowship

This memorial fellowship has been established from funds donated in memory of David Jay Gambee, a former UCSD Revelle College student. Similar to the President's Undergraduate Fellowship Program, this fellowship helps assist undergraduate students to pursue special studies and projects in the areas of university governance, ecological values clarification, encourages volunteer services in the community, or participation in programs related to the Institute on Global Conflict and Cooperation. Research is conducted under faculty supervision during the academic year and/or vacation periods. Winners, who must be enrolled throughout 1993-94, are awarded a need-based stipend, determined by the cost of the project.

DAVID MARC BELKIN MEMORIAL FELLOWSHIP

This memorial fellowship has been established from funds donated to UCSD in memory of David Marc Belkin, a former Muir College student. This fellowship 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. Research is conducted under faculty supervision during the academic year and/or vacation periods. Winners, who must be enrolled throughout 1993-94, are awarded a need-based stipend as determined by the cost of the project.

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 non-citizen.
2. Be enrolled in good standing in a program leading to a degree or certificate and maintain satisfactory academic progress as defined for UCSD financial aid recipients. Please refer to the *Financial Aid Information Guide* for specific information.
3. Not be in default on any Perkins Loan (formerly National Direct Student Loan), Stafford Loan (formerly Guaranteed Student Loan), PLUS Loan, or Supplemental Loan received at any institution.
4. Not owe a refund on any Title IV grants received at any institution.
5. 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 1992 federal income tax returns with a UCSD Income Tax Certification form, and any other required documents. For specific instructions, refer to the *Financial Aid Information Guide*, which is available upon request. The FAFSA form should be filed by March 2, 1993, the UCSD priority filing date, with the appropriate processing agency and must indicate the University of California, San Diego to receive a processed copy of the FAFSA.

RECEIVING FINANCIAL ASSISTANCE

UC financial assistance 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 at a part-time job while attending school, or a combination of both. UCSD uses an equity packaging formula which ensures that students in similar circumstances all receive the same percentage of "gift" aid and the same percentage of "self-help" aid.

FEDERAL PELL GRANT

The Federal Pell Grant program is designed to provide financial assistance to undergraduates attending post-high-school educational institutions. Federal Pell Grants are intended to be a "foundation" of an undergraduate financial aid package and may be combined with other forms of aid in order to meet the student's educational costs. Apply for a Federal Pell Grant by completing the FAFSA.

UNIVERSITY OF CALIFORNIA GRANT PROGRAM

The University of California Grant-In-Aid Program provides nonrepayable grants to students who demonstrate financial need. The Opportunity Grant is a state-funded grant awarded to undergraduate students who have demonstrated financial need.

FEDERAL SUPPLEMENTAL EDUCATIONAL OPPORTUNITY GRANT (SEOG)

SEOG awards are federally funded and are granted only to undergraduate students demonstrating financial need. 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. Current recipients must reapply each year to have their award renewed. All applicants for UCSD aid are required to apply for a Cal Grant by March 2, 1992, using the FAFSA; UCSD will be unable to fund the amount of a full Cal Grant fee award (\$2,089 during 1992-93) for students who do not receive this grant.

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 reapply each year to have the award renewed. A FAFSA must be filed by the preceding March 2.



FEDERAL SUPPLEMENTAL LOANS FOR STUDENTS (SLS) AND FEDERAL PLUS LOANS FOR PARENTS

Independent undergraduates, graduate students, and parents of dependent undergraduate students are eligible to borrow under this program. The interest rate for this loan is variable, established each July 1 for the following academic year (for 1992-93 the interest rate was set at 7.36 percent). Parents of dependent undergraduates are eligible to borrow up to the cost of education minus other financial aid (including other loans). Graduate students are eligible to borrow up to \$10,000 per year (with a cumulative maximum of \$73,000 including undergraduate SLS loans). Independent undergraduate students are eligible to borrow up to \$4,000 per year during the first and second years and \$5,000 per year for the next three years (with a cumulative maximum of \$23,000). The first payment is due within sixty days of the date the loan is disbursed. In-school deferments of principal and interest payments are available for students, and parent borrowers may also defer payments for unemployment, parents' in-school status, and economic hardships. Deferred interest will be capitalized on a minimum quarterly basis. Student borrowers must file a FAFSA and complete the UCSD financial aid application process for eligibility to be determined. Applications and further information may be obtained from the Student Financial Services Office after July 1 for the following academic year.

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 maximums, aggregate maximums, and interest rates are the same. The maximums include amounts borrowed under the Federal Stafford Loan program. The federal government does not pay the interest for the student during in-school and different periods. Repayment begins when the borrower leaves school or ceases to be enrolled for six units or more. The amount borrowed cannot exceed the cost of education minus other financial aid (including other loans).

EMERGENCY SHORT-TERM LOANS

These limited student emergency loan funds, made possible by gifts to the university,

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. Students with demonstrated financial need will be considered. 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

A student is eligible for a Federal Perkins Loan if he or she demonstrates financial need. An undergraduate student may borrow up to \$3,000 per academic year, and graduate students may borrow up to \$5,000 per academic year. The aggregate sum for all undergraduate studies may not exceed \$15,000. A graduate or professional student may borrow up to a \$30,000 maximum, including the amount borrowed as an undergraduate, for his or her total academic career. Students under eighteen years of age are required to obtain a co-signer. For new borrowers, repayments and interest (currently 5 percent) begin nine months after ceasing to be enrolled at least half-time.

UNIVERSITY LOANS

University Loans are also available. The eligibility requirements and terms, except for differences in cancellation provisions, are generally the same as for the Perkins Loans. A co-signer is required for this loan.

FEDERAL STAFFORD LOANS (FORMERLY GUARANTEED STUDENT LOANS)

These loans are available to students who demonstrate financial need. The annual maximum allowed during the first year of undergraduate study is \$2,625. Second-year students' annual maximum is \$3,500, and third-, fourth-, and fifth-year students' annual maximum 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 of up to \$65,000, including the amount borrowed as an undergraduate. The interest rate for new borrowers is variable. The 1992-93 rate is 6.94 percent.

Repayment begins six months after the borrower leaves school or ceases to be enrolled as a half-time student.

Stafford Loan applications are mailed to students who have filed a FAFSA, have completed the UCSD financial aid application process, and have been determined to have loan eligibility based on financial need.

are granted in small amounts to help non-financial 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 in the Student Financial Services Office.

FINANCIAL ASSISTANCE, GRADUATE

See section entitled "Graduate Studies" for additional types of financial assistance available to graduate students.

HOUSING

ON-CAMPUS HOUSING

Administration:
Building 514 University Center
Mail code 0041
534-4010

SINGLE UNDERGRADUATE HOUSING

Revelle, John Muir, Third, Warren, and Fifth 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 \$6,400 plus a \$75 deposit for the 1993-94 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 John Muir, Third, and Fifth Colleges are available. UCSD also offers two-bedroom apartments for four single undergraduate students of Third College, Warren College, and Revelle College. 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, beginning in February, to all who have indicated their interest in on-campus housing on their application for admission. 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 June 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 1993-94 was May 6, 1993, 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 206 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-, two-, and three-bedroom apartments in the Residential Apartments, Warren Apartments, and La Jolla Del Sol complexes.

MARRIED AND SINGLE GRADUATE HOUSING

Located approximately two miles from campus, the Residential Apartments and La Jolla Del Sol are the primary housing facilities available to married and single graduate 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. 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, jacuzzies, two tennis courts as well as a 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 \$369 to \$954 per month and are subject to change with thirty days' prior notice.

The Residential Apartments currently have extensive waiting lists. All policies and procedures concerning the operation of married and graduate student housing, the eligibility for housing, the application process are subject to change without notice.

SINGLE GRADUATE HOUSING - ON-CAMPUS

Opening for fall 1993 and located on the main campus are single graduate apartments. These units on the Warren College campus are four-person apartments, each having private bedrooms and shared kitchens, bath, and living/dining space.

Additionally, there will be meeting rooms and lounges located within the building for use by residents.

For more detailed information and/or an application, you may write, apply in person, or telephone any of the facilities at the following:

- Residential Apartments Office
(Coast and Mesa)
UCSD—0907
9224-B Regents Road
La Jolla, CA 92093-0907
(619) 534-2952
- La Jolla Del Sol Office
UCSD—0913
8046 Regents Road
San Diego, CA 92122
(619) 587-1221
- Warren Apartments Office
UCSD—0091
9500 Gilman Drive
San Diego, CA 92093-0091
(619) 534-7157

INTERNATIONAL CENTER

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

The International Center assists U.S. students going abroad as well as foreign 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 Pro-

grams Abroad Office, and administration of the systemwide UC Education Abroad Program.

The Foreign Student/Scholar Office serves as the liaison with government agencies for all nonimmigrants, and advises foreign 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 foreign 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
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.

CAMPUS RECREATION

Canyonview Athletic and Recreation Complex
Mail Code 0905
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

- Main and Recreation Gymnasia
- Indoor 25-Yard Natatorium Pool and Spa
- Outdoor 50-Meter Canyonview Pool and Spa
- Canyonview Racquetball Center
- 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 water polo, 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, "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
534-2521

The Office of Religious Affairs is a cooperative venture of representatives from various religious denominations for the purpose of providing religious counseling and other religiously oriented programs to students, faculty, and staff at UCSD. The office also serves as a theological resource concerning current moral and ethical issues, as well as a center for facilitating communication between the university and community religious organizations.

STUDENT AFFIRMATIVE ACTION

Building B, Student Center
 Mail code 0329
 SAA & HR Programs Office: 534-6708
 Program Interns Office: 534-2573
 Student Affirmative Action Committee (SAAC): 534-2573
 Human Relations Coalition (HRC): 534-2573

The responsibility of this unit is to serve as a campus resource on issues of cross-culturalism, on situations of racial/ethnic and gender insensitivity or discrimination, and on the recruitment/retention/academic achievement/graduation of affirmative action students. There is also a focus on human relations issues—emphasizing the need for people within the UCSD community to understand and appreciate those different from themselves. These educational efforts include workshops, cross-cultural immersion experiences, leadership development training, and in-service training programs.

In addition to these educational programming activities, at present, the following components constitute Student Affirmative Action and Human Relations Programs:

- Complaint Report/Resolution Center
- Human Relations Coalition (HRC)
- Oversight and Update of the UCSD Five-Year SAA Plan
- Programming/Funding on Diversity and Human Relations Issues
- Student Affirmative Action Committee (SAAC)
- SAA Internship Program

The Human Relations Coalition (HRC) is composed of a myriad of student representatives from across the UCSD community. The HRC was established to provide a direct link between students and the university administration on human relations issues (e.g., free speech infringement, hate crimes, intergroup conflict, religious intolerance and insensitivity, etc.). The HRC seeks to ensure a civil and supportive campus climate by promoting and fostering mutual respect and understanding among all groups and individuals within the UCSD community. Additionally, the HRC provides a much needed forum in which to identify and ameliorate human relations problems at UCSD.

The Student Affirmative Action Committee (SAAC) comprises one representative from each of the six affirmative action student organizations: African-American Student Union (AASU), Asian/Pacific Student Alliance (APSA), Disabled Students Union (DSU), Movimiento Estudiantil Chicano de Aztlan (MEChA), Native American Student Alliance (NASA), and the Women's Resource Center (WRC). SAAC serves in an advisory capacity to the vice chancellor for Student Affairs on issues which affect the quality of campus life and the educational experience of underrepresented students at UCSD. The elected representatives serve as voting members of SAAC generally for one academic year.

The internship program is the vehicle by which SAAC is able to review and evaluate the Student Affairs programs and units, thereby ensuring responsiveness to the needs of affirmative action students. The interns also provide the research and informational basis for appropriate recommendations from SAAC to the vice chancellor for Student Affairs. The internship program started in 1976; since its inception, the interns have researched a number of assigned topics and areas within student and academic affairs at UCSD. Upon completion of the assignment, the interns submit their findings to SAAC, from which a written evaluative report—including recommendations, where appropriate—is provided to the vice chancellor for Student Affairs.

SAA programming was established in an effort to assist SAAC constituent organizations and other student groups engaged in planning programs which improve or enhance the goals of the UCSD student affirmative action program and the Five-Year SAA Plan.

STUDENT HEALTH SERVICE

Mail code 0309
 534-3300

Comprehensive primary health care is provided at the Student Health Service without charge during the academic year for all university registration fee-paying students. Services are available during the summer for a modest fee. A well-qualified medical staff is in attendance at the Student Health Center, and students are encouraged to come for professional and confidential attention to any health problem or concern. Students can be seen on a walk-in basis or by appointment from 8:00 a.m. to 4:30 p.m., Monday, Tuesday, Thursday

and Friday and 9:00 a.m. to 4:30 p.m. on Wednesday.

The Student Health Service offers Women's, Men's, and Dermatology Clinics on a scheduled basis. Health education and promotion and birth control services are provided, as are laboratory and X-ray services. A travel clinic and low-cost pharmacy and immunization services are available as well as optometric and dental care.

Entering students are requested to complete and return a Health History form prior to registration. The information submitted to the Student Health Service is kept confidential and is carefully reviewed to help provide optimal health care. Students are also urged to submit a physical examination form completed by their family physician, particularly if they plan to enter into intercollegiate athletic competition.

Although undergraduate, graduate, medical, and nurse practitioner students may have unlimited visits with the Student Health Service staff, students requiring medical or surgical care beyond that available from the staff should be prepared to meet the costs of such care. All students are strongly urged to provide themselves with adequate sickness and accident insurance.

A *Student Limited Insurance Plan* (SLIP) is provided without charge to all eligible students to help them defray some of the expenses of necessary *outpatient* care beyond that which can be provided directly by the Student Health Service. Within specified limits, this plan provides benefits for laboratory tests, x-rays, consultations with specialists, emergency room care, and ambulance transportation.

A *Voluntary Insurance Plan* (VIP), available for purchase by undergraduate students each quarter, 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 foreign students. GSHIP provides benefits for certain outpatient services, hospitalization, surgery, and major medical expenses. 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 three insurance plans and their limitations, exclusions, and

CAMPUS SERVICES AND FACILITIES

open enrollment periods are available at the Student Health Center. A representative of the insurance company who has an office at the Student Health Service may be consulted regarding these plans.

STUDENT POLICIES AND JUDICIAL AFFAIRS

Building B, Student Center
Mail code 0329
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 of Titles VI and IX, Section 504 of the Rehabilitation Act, Right to Privacy as it affects students, and the Student Diversion Program. In addition, the director also provides legal advice and consultation to all Student Affairs units, including the vice chancellor of Student Affairs and the college and resident deans.

STUDENT LEGAL SERVICES

Building B, Student Center
Mail code 0329
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
534-5793

The Student Safety Awareness Program seeks to increase awareness about the problem of sexual assault and to prevent and decrease the incidence of this crime. The goal of the program is to educate both men and women by dispelling the many myths that abound, by providing and publishing updated printed material such as brochures and pamphlets, and by providing programs and workshops on rape

prevention and education, including self-defense techniques and strategies, assertiveness training, and coping mechanisms. Counseling and extensive referrals are available.

The program also provides information and education in the areas of sexual harassment and personal safety. Students who have questions and/or concerns about sexual harassment may seek confidential assistance by calling the above number.

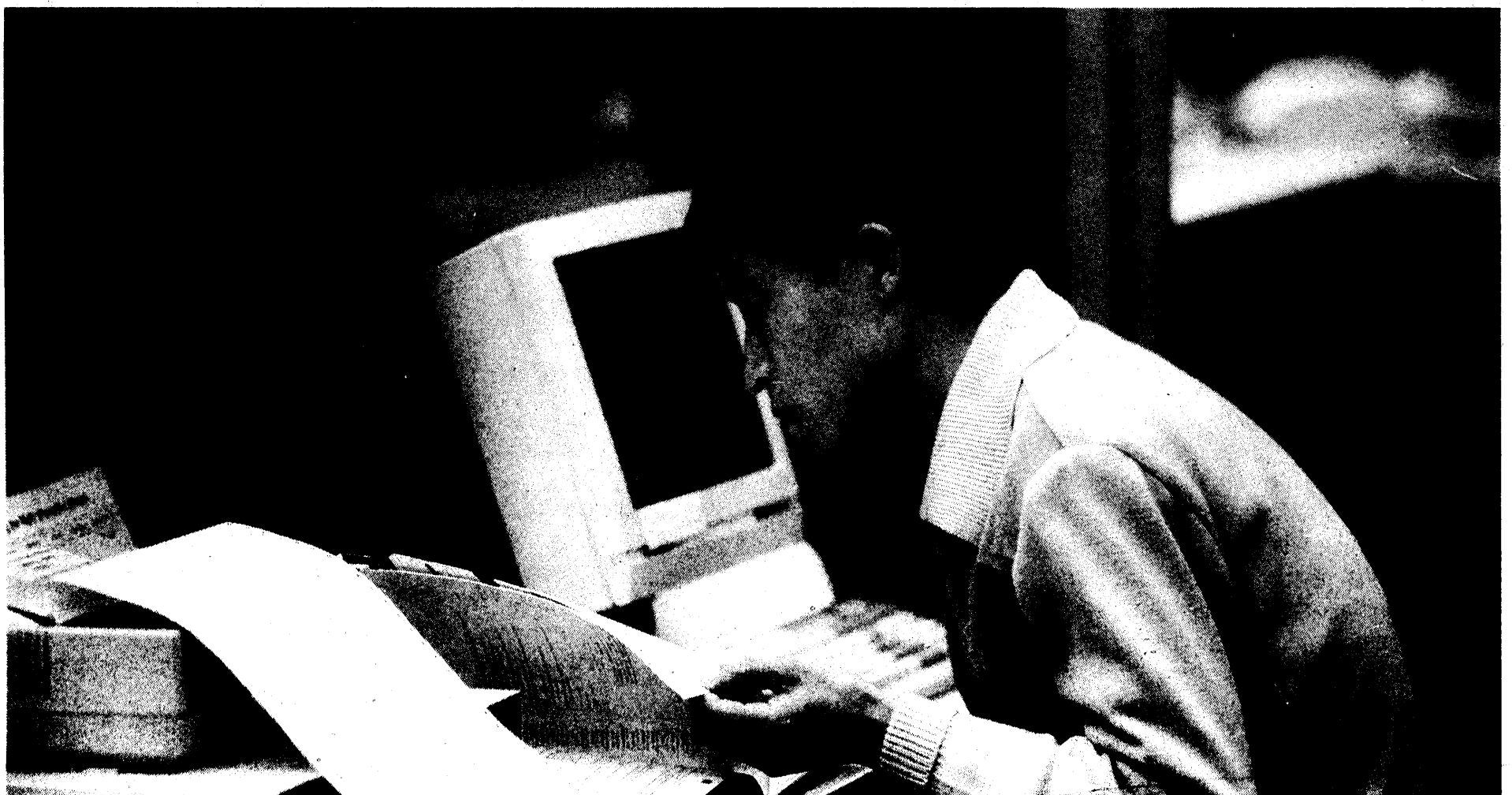
UNIVERSITY CENTERS

The two buildings which constitute the University Centers at UCSD provide the campus community with services and programs beyond the teaching and research functions of the university. Both the Price Center and the Student Center are places for students to meet, dine, and relax. The centers provide services and activities designed to meet the demands and needs of the student population.

THE PRICE CENTER

Mail code 0076
Administration office: 534-4022

Located in the center of campus, just south of Central Library, the Price Center houses a variety of services. With seven fast-service restaurants, a movie theater, computer lab, post office, four ATMs, travel service, box of-



rice, art gallery and photo lab, the center's aim is to meet the needs of UCSD's diverse community. The Price Center has for reservation fourteen meeting/conference rooms, including a spacious Grand Ballroom. Comfortable lounge areas and a music listening lounge, as well as a unique game room allow students to relax, listen to music, or play a variety of games. Student organizations and student government offices are located in the center as well. Administrative offices of the University Centers, University Events & Student Activities, Associated Students, and the Alumni Office are also housed here. In addition, the Price Center is the home of the UCSD Bookstore.

THE STUDENT CENTER

Mail code 0323

Administration office: 534-8929

The Student Center, located east of the Main Gym, offers services operated by students. The student-run co-ops and enterprises include the General Store Co-op, Bike Shop, Food Co-op, Soft Reserves/Lecture Notes, Groundworks Books, Computer Co-op, and KSDT Radio. The Grove Caffe serves specialty coffees and pastries as well as other food and drink. Located next to the Grove Caffe are the Craft Center the Grove Gallery. The Craft Center offers a variety of classes to students, faculty, and staff. The Grove Gallery hosts art exhibitions and showcases student-made art. The campus media, including the *UCSD Guardian*, Women's Resource Center, and other student organization offices are also located in the Student Center. The Ché Cafe restaurant, a part of the Student Center complex (located at the southern end of Revelle campus), offers a vegetarian menu at affordable prices.

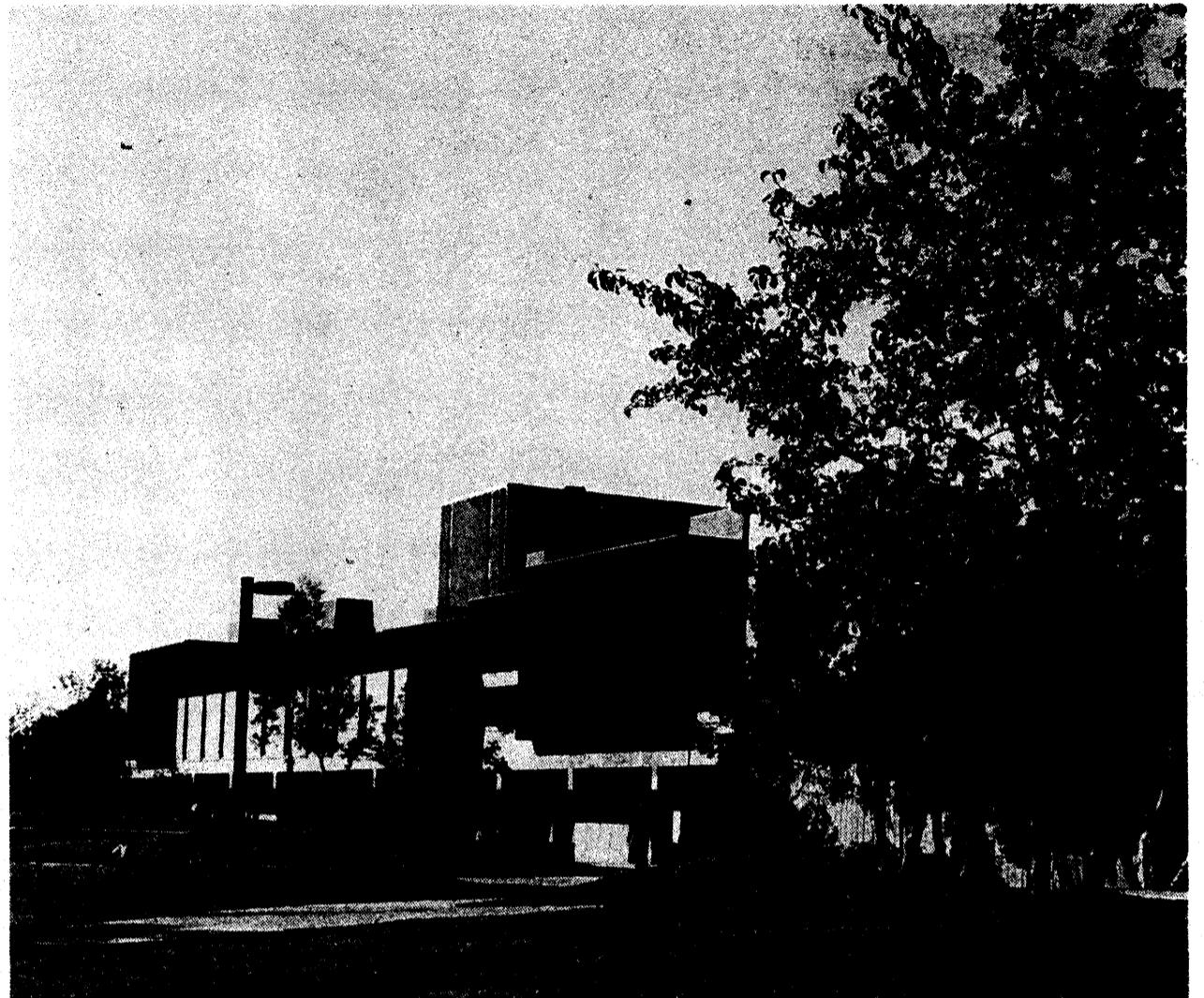
STUDENT INFORMATION CENTER (EDNA)

Mail code 0076

Administration Office: 534-3362

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

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



STUDENT GOVERNMENT SERVICES

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 owns and 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

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 fine arts, films, speakers, and popular entertainment.

The staff is a central resource for programming advice and assistance in the areas of event planning, publicity, 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
534-4090

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 210 University Center
Mail code 0013
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 in service; who died as a result of a service connected disability; who became permanently and totally disabled as a result of a service connected disability; who died while a disability so evaluated was in existence; or who have been listed as missing in action, captured, detained,

or interned in line of duty by a foreign government or power for more than ninety days.

2. A serviceperson who entered service after December 31, 1976 and who contributed to an education fund.

3. Members of the Selected Reserve who enlist, reenlist, or extend an enlistment for a six-year period or more, beginning July 1, 1985.

4. A veteran of World War II or thereafter who has a service connected disability and needs vocational rehabilitation may apply at Disabled Student Services, 204 University Center.

ACADEMIC REQUIREMENTS

A student receiving veterans' benefits is required to maintain satisfactory progress and conduct according to standards established and enforced by the institution, fully and clearly published in this catalog under "Academic Regulations."

All students who are on probation more than one quarter or who are subject to academic disqualification are considered to be making unsatisfactory progress according to V.A. regulations and are not eligible to receive their veterans' benefits. Their status will be reported to the Veterans Administration.

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.

OTHER SERVICES AND PROGRAMS

UCSD ALUMNI ASSOCIATION

Price Center
Mail code 0083
534-3900

Founded in 1972 with a grant from the University of California Board of Regents, the UCSD Alumni Association provides a principal link between graduates and the university. Revenues generated by this nonprofit membership organization enable the association to provide student scholarships, honor distinguished alumni, provide career related programs, develop regional clubs, and participate in legislation affecting higher education.

The association is governed by a board of volunteer alumni directors who are elected by members and who are representative of all of the UCSD colleges.

Members of the UCSD Alumni Association enjoy free library privileges at all UCSD and UC libraries, educational and professional seminars, travel programs, a subscription to *UCSD Perspectives*, discount cards, and a members only newsletter.

ART GALLERIES

MANDEVILLE ART GALLERY

Mandeville Center, Room 101
Mail code 0327
534-2864

Mandeville Art Gallery exhibitions cover a wide range of fields, with an emphasis on changing exhibitions of contemporary works. Last year's exhibitions included: *Manny Farber—Black and White Paintings, 1985–1991, Three British Book Artists, Contact: Photojournalism since Vietnam, Conceptual Sculpture: Body and Soul, and Ceramic Variation: Three Installations.*

Gallery hours are from 12:00 noon to 5:00 p.m., Tuesday through Sunday. The gallery is closed Mondays and holidays. There is no admission charge.

MANDEVILLE ANNEX GALLERY

Mandeville Center, Room B-118
Mail code 0327
534-3102

The Mandeville Annex Gallery is a graduate and undergraduate student gallery. A new exhibition is mounted each week of the quarter. Included in the exhibition schedule are visual arts group class shows and M.F.A. exhibitions. Gallery hours are from 12:00 noon to 5:00 p.m., Monday through Friday. There is no admission charge.

GRADUATE STUDENT GALLERY

Visual Arts Facility, Room 309
Mail code 0327

The new six-building complex, which opened January 1993, houses the Graduate Student 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
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 534-2021.

DAY CARE CENTER

Mail code 0962
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 subsidy is available for income eligible, full-time students on a limited basis. Only full-time enrollment is offered, 7:45 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 or make an appointment with the director.

As an alternative, the Infant Toddler Referral Service aids campus families in locating licensed home-care providers from six weeks through preschool ages. For assistance, call 534-7740 during office hours or leave a recorded message for a return call.

PARKING AND TRANSPORTATION SERVICES ON CAMPUS

Building 400 University Center
Mail code 0040
534-4223

Parking permits are required on the UCSD main campus from 7:00 a.m. to 11:00 p.m. Monday through Friday, Saturday and Sunday 10:00 a.m. to 11:00 p.m., and at Scripps Institution of Oceanography from 7:00 a.m. to 5:00 p.m. every day, unless otherwise posted. This requirement is enforced by the Department of Community Safety through the issuance of parking citations.

Permits are available at the Parking Office, Building 400 University Center. Permits may be picked up between the hours of 7:30 a.m. and 4:30 p.m. Request for a permit requires a completed application. Applications can be obtained at the Parking Office. Student "S" permits must be paid in advance, preferably through registration fees; otherwise payment will be made to the Central Cashier. Quarterly student permits are also available. Student permits are valid only in yellow-striped spaces. A grace period during Welcome Week of the fall quarter *only* allows students to park in yellow-striped spaces without a permit. Effective the first day of classes of fall quarter, all vehicles parked on university property must display a valid parking permit.

If you have any questions about parking, phone 534-4223. Those who are interested in joining a carpool, forming a vanpool, or getting information on San Diego Transit or North County Transit phone 534-RIDE.

PRINTING AND DUPLICATING SERVICES

Campus Services Complex, Bldgs. A and B
Mail code 0031
534-3020

Several kinds of printing and duplicating services are available on campus. The Price Center has self-service photocopying machines which make copies for \$.05 a page.

The copier machine located in Graphics and Reproduction Services, Campus Services Complex, Buildings A and B, is especially good for thesis work requiring excellent copy quality. Copies cost \$.05 each, and students are requested to reserve time in advance for the use of the machine. "On demand" electronic publishing is available from a large variety of electronic input.

STUDENT MAIL SERVICES

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

The Student Mail Services provides Monday through Saturday distribution of mail to resident students during the academic year. Hours of operation are 7:30 a.m. to 4:30 p.m.

UCSD BOOKSTORE

Price Center
Mail code 0008
534-READ

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.

SUNSHINE STORE

Price Center
Mail code 0008
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
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, 534-4357

The duty of the UCSD Police Department is to protect life and property through the enforcement of local, state, and federal laws. It is the goal of the police department to ensure the existence of a safe campus environment, free from unlawful disruptions and illegal activities, in an 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

534-3644

The Police Department's Crime Prevention Program offers a variety of information to the campus community on crime prevention methods. Pamphlets, displays, and informative seminars are available.

CAMPUS PROTECTION ASSISTANT PROGRAM

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

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.

BICYCLE AND SKATEBOARD PROGRAM

534-7335

The UCSD Police Department's Bicycle and Skateboard Program provides enforcement of the UCSD Bicycle and Skateboard Regulations. The program also provides licensing, registration, safety pamphlets, and bike route maps to encourage bicycling as an alternative form of transportation.

LOST AND FOUND

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

242 Price Center
Mail code 0324
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, 9:00 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.





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.

UNIVERSITY-WIDE INSTITUTES/ ORGANIZED RESEARCH UNITS

California Space Institute (Cal Space), headquartered at Scripps Institution of Oceanography, was established in 1979 as a multi-campus 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 consortium of UC San Diego, Berkeley, and Los Angeles was designated in 1989 as a Space Grant College by NASA's Office of Education. The program expands leadership in the development and application of space resources through research, fellowship funding, and educational outreach activities. CalSpace works with the Jet Propulsion Laboratory (JPL) and California-based aerospace corporations 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; of non-Newtonian gravity through continental and oceanic gravitational measurements; 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 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 tomogra-

phy; 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; 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 six of these stations in the 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 a telemetered seismic array in the Anza, California, area. 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, Applied Mechanics and Engineering Sciences, and Physics. Support for visiting scholars is provided through an endowment to the Cecil and Ida Green Foundation for the Earth Sciences.

Institute on Global Conflict and Cooperation (IGCC) was founded in 1983 as a multi-campus research unit serving the entire UC system. The purpose of the institute is to study the causes of international conflict and to promote opportunities for international cooperation. The institute's research agenda includes conventional and nuclear arms control and proliferation issues, international environmental policy, the links between domestic politics and foreign policy, and regional dynamics. In addition to research projects undertaken by the central office, IGCC supports research, instructional programs, and public education throughout the UC system. The institute is supported financially by the Regents of the University of California and by the state of California, and has received grants from such foundations as Ford, MacArthur, Rockefeller, Sloan, the Carnegie Corporation, W. Alton Jones, Ploughshares, and the United States Institute of Peace.

Intercampus Institute for Research at Particle Accelerators (IIRPA) is an inter-campus research unit established to facilitate the use of large national laboratory particle accelerator centers by individual University of California campuses. The principal activity at these particle accelerator centers is concerned with high-energy and elementary particle physics. Other disciplines are also finding more uses for the radiation from these accelerators, and hence the institute includes individuals engaged in biophysics research. There is at present no direct graduate program in the institute; however, graduate students in physics and biophysics can participate in the activity of the institute through their respective campus departments.

CAMPUS-WIDE 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 Division 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 major areas of tissue engineering science 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 bio-systems 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 with 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.

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 is multidisciplinary, 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, (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 members of departments in the sciences and in 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.

Sam and Rose Stein Institute for Research on Aging encourages interdisciplinary research into a wide range of phenomena and changes in body function 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 to be 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.

CENTERS

The UCSD **Cancer Center (CC)**, active in the fight against cancer since 1978, is a National Cancer Institute-designated Clinical and Research 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 geo-

graphic area within Southern California. Patient care activities of the Cancer Center are located in the Combined Oncology Clinic at the Theodore Gildred Cancer Facility and in the Inpatient Oncology Unit at UCSD Medical Center, both located at Hillcrest. 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 \$20 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;

astronomy; solar, 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, and have contributed experiments to many major NASA space missions.

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 \$15 million, mostly from federal funding sources.

The Marlar Foundation provides several enhancements to the academic program, including a fellowship to an outstanding senior graduate student, and funding for a yearly public lecture given by an eminent astrophysicist.

The **Center for Energy and Combustion Research (CECR)**, in 1986, replaced and en-



comprised 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. These interdisciplinary studies involve faculty members from several UCSD departments and SIO. 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.

Center for Human Information Processing (CHIP) provides facilities for visiting scholars and research. Associated laboratories undertake psychological and interdisciplinary projects in the areas of perception, psychophysics, cognitive development, psycholinguistics, attention, memory, decision theory, judgment and choice, information integration, and cognitive functions. The work of the center concentrates on theoretical and research projects, postdoctoral studies, workshops, conferences, and discussion groups.

Operating under the auspices of the Center for Human Information Processing is the **Laboratory of Comparative Human Cognition (LCHC)**. 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.

Within psychology, the approach adopted by LCHC is variously referred to as cultural-historical psychology, cultural psychology, or 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.

At present, the core faculty of LCHC hold degrees in anthropology, education, artificial intelligence, psychology, and philosophy. It is

also a multiethnic and multinational faculty. The research projects are conducted across a variety of comparative dimensions: cross-national and cross-cultural comparisons, comparisons across social class boundaries within a single ethnic community, studies of bilingualism and bidialectism, and comparisons between institutional settings. An especially important comparative dimension is temporal, involving the study of transformations and developmental transitions over time.

Current research projects are grouped around three major areas: (1) studies of language, culture, and technologies in educational settings; (2) studies of work and expertise; and (3) studies of discourse and representation. Much of the research is interventionist and involves collaboration between researchers, students, local communities, and practitioners in the field. The LCHC publishes *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition*, now in its fourteenth volume. 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.

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 Language and Area Studies.

The **Center for Magnetic Recording Research (CMRR)**, founded in 1983, is a national center 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 and biomedical sciences. The latest techniques of gene isolation, gene manipulation, including the control of gene expression, and the genetic transformation of cells and organisms are both further developed and applied to major problems in biology and medicine. Current research and instructional programs are in the fields of developmental biology, human heredity, immunology, molecular neurobiology, plant molecular biology, and applied microbiology.

The center serves as a resource for the entire campus for molecular genetic techniques, materials and facilities, and encourages interactions with other organized research units in the biomedical area.

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 un-

der which the results of artistic, scientific, and technological pursuits are understood.

Center for Research in Language

(CRL). The foci of the center are on processing models of language understanding, first and second language acquisition, and neuro-linguistics. 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 model of speech perception; studies in first language acquisition; cross-linguistic comparisons of the process of language acquisition and aphasia; the psycholinguistic characterization of the process of acquisition of sign language by deaf children and of other gestural communication; study of tone sandhi across certain Chinese dialects; 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 a neural networks training program sponsored by the MacArthur Foundation. This program provides training for developmental psychologists in network modelling techniques. CRL has entered into an institutional agreement with the Istituto di Psicologia of the Italian National Council for Research, Rome. This agreement provides 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 exclusively to the study of Mexico and U.S.-Mexican relations. It combines research in all of the social sciences and history, graduate and undergraduate student training, continuing professional education, publications, and public education activities that address the full range of problems affecting economic and political relations be-

tween Mexico and the United States. The center also studies the history, economy, political system, and social structure of Mexico; aspects of the U.S. economy and U.S. public policy that affect Mexico; and Mexico's economic interactions with Japan and other Pacific Basin countries.

Through its program of visiting research fellowships, 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 at the center. Typically, people from Mexico receive over half of these fellowships, which are awarded through an open, international competition. Other visiting fellows come from Europe, Canada, Latin America, and the Far East. 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, Japanese investment in Mexico, and social and economic consequences of North American free trade. 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 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 **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. In late 1991, APIP co-organized the third in a series of national affairs symposia at UCSD. These highly successful conferences focused upon different aspects of the presidency and resulted in critically acclaimed books as well as national public television specials, the second of which received an Emmy nomination for the best news interview program.

APIP's collaboration with UCSD's Center for U.S.-Mexican Studies continued in 1991 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.

APIP currently is co-establishing a survey research facility that will begin its operation in



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the fall of 1992 with a San Diego-based survey on current political issues.

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. Grants have been awarded to support a training program of postdoctoral fellows. A seminar series and other activities have been initiated to facilitate interaction among faculty from over six departments and three geographic locations. This project provides a possible basis for the development of an organized research unit at some future time when a larger basic research program in AIDS has been developed.

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 supra-molecular 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 Ångströms.

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 Conservation Science**, established in December 1987, is the planning stage of a proposed international Center for Conservation Science. The project addresses the urgent need to improve the scientific basis of species and community conservation, habitat restoration, and natural resource management for sustained development. Coordinated by ecologists and geneticists in the Department of Biology, the participants also include researchers in the Department of Anthropology, the School of Medicine, Scripps Institution of Oceanography, the National Marine Fisheries Service Laboratory, and the Center for the Reproduction of Endangered Species at the San Diego Zoo. Existing linkages between local participants and field research and training programs in Montana, U.S.A., Kenya, Thailand, and several other countries are being strengthened and, in some cases, institutionalized. The project will seek ways to foster the further development of local and international research, educational, and training opportunities.

The **Project in Geometry and Physics (PGP)**, established in 1987, provides opportunities for increased collaboration among mathematicians and physicists.

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 a regular luncheon and lecture series for the faculty and public on international affairs. 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. It periodically sponsors town meetings for students and the general public on major issues in international affairs. Other PISA projects planned or under way include a newsletter for UCSD faculty interested in international affairs and assistance for undergraduates who wish to conduct special projects in regard to international affairs.

The **Structural Systems Research Project (SSRP)** promotes research and graduate education in the development of contemporary methods for the design and analysis of large-scale civil, aerospace, geo-, and ocean-based structures. The research team, which includes participants from the university and industrial institutions on a national basis, incorporates individuals with expertise in large-scale experimental testing, theoretical modeling, numerical algorithms and computer code development, interactive experimental techniques, data processing, limit state design, and optimal design.

The core of the project is the Charles Lee Powell Structural Systems Laboratory. This facility is the largest structures laboratory in the United States. It features a fifty-foot-high reaction strong wall for the testing of up to five-story full-scale buildings and other structural systems. When combined with an extensive closed loop-servo controlled hydraulic system and the Cray supercomputer, which is hard-lined to the facility, *interactive* experiments may be performed wherein actual dynamic environments are simulated. One such case involving the nonlinear response and damage evolution of a five-story structure to critical seismic excitations is currently in the development stage as part of a U.S.-Japan cooperative program in earthquake engineering. Research projects with CALTRANS on bridge rehabilita-

tion and seismic retrofitting are in progress. Offshore structural systems research with the National Sea Grant Office and several oil companies is in progress on strength assessment and retrofit of damaged platform members. Aerospace-related research for NASA and NSF involves the development of aeroelastically tailored helicopter, tilt-rotor, and turbopropeller blades composed of advanced composite materials and the development of hybrid-damped composite structures using passive and active techniques.

NATURAL RESERVE SYSTEM (NRS)

The **Natural Reserve System (NRS)** was founded to establish and maintain a system of natural land and water areas as samples of the diversity of California's 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. Further inquiries can be directed to Dr. Paul Dayton, chair of the UCSD NRS advisory committee, 534-6740, or to Ms. Isabelle Kay, academic coordinator, 534-2077. The San Diego campus administers the following four reserves:

Dawson Los Monos Canyon Reserve: This 200-acre reserve is located on the outskirts of the city of 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, and extensive records are available for this reserve.

Elliott Chaparral Reserve: Located a short distance to the east of campus, this 107-acre reserve, adjacent to the large expanse of Miramar Naval Air Station that is undeveloped, features Chamisal Chaparral typical of the Southern California coastal plain. 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 is the last tidal salt marsh on Mission Bay and one of the few remaining in Southern California. It provides habitat for two rare and endangered birds, the light-footed clapper rail and the Belding's savannah sparrow. 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 sixty-seven acres extending seaward 1,000 feet from the beach which were granted to the university by the state legislature for scientific purposes. 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 cliff-top knoll and canyons include coastal sage and desertic maritime scrubs, sea bluff succulent scrub, 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.

CAMPUS-WIDE RESEARCH FACILITIES

ACADEMIC COMPUTING SERVICES

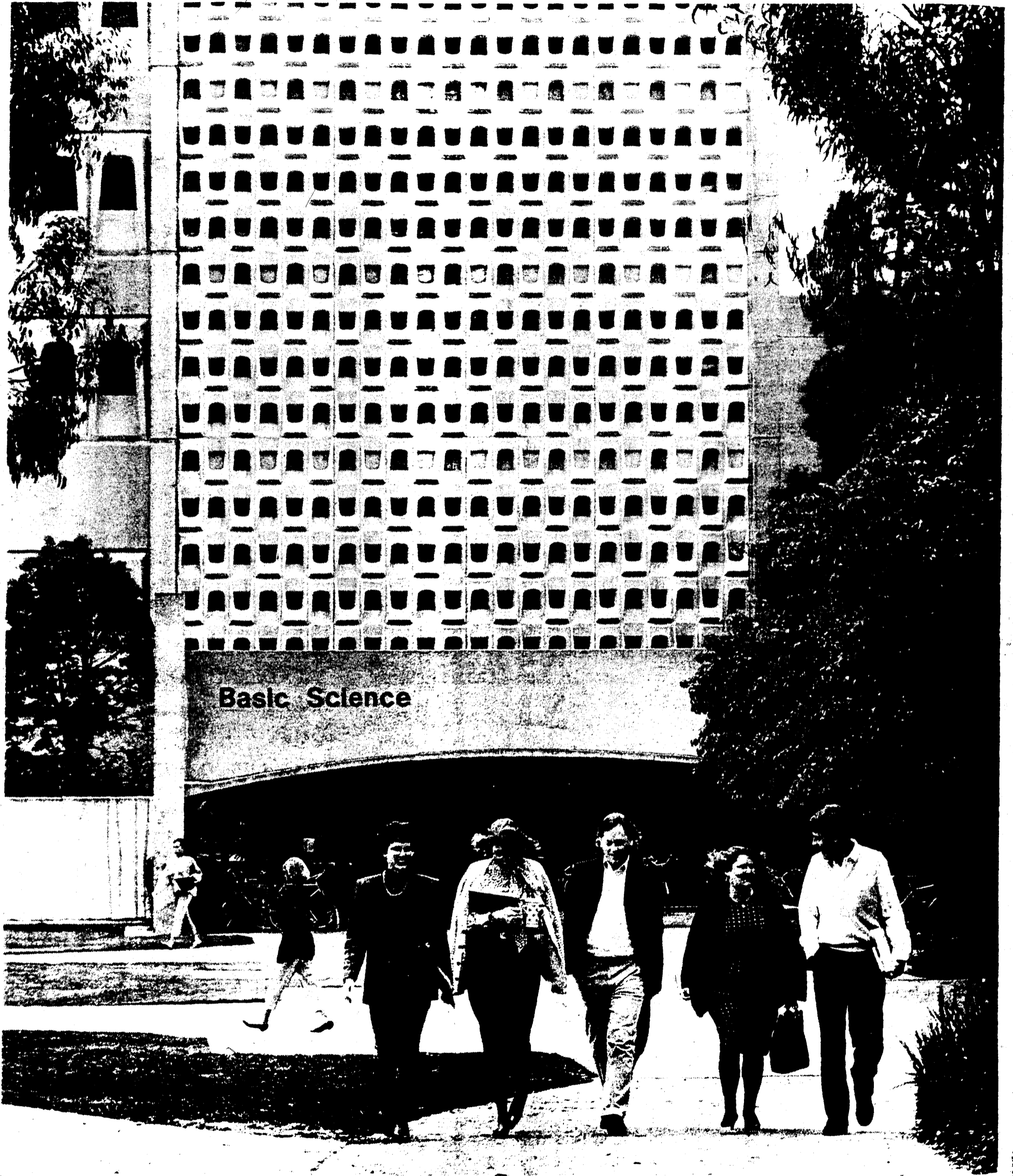
See page 95.

SAN DIEGO SUPERCOMPUTER CENTER

See page 98.

THE UNIVERSITY LIBRARY

See page 101.



THE SCHOOL OF MEDICINE

The faculty of the School of Medicine is committed to nurturing and reinforcing the attributes that are important in the making of a doctor—dedication, compassion, and intellectual curiosity.

The goal of the medical school curriculum, clinical experience, and faculty-student interactions is to develop well-trained, objective, and conscientious physicians prepared for the changing conditions of medical practice and continuing self-education. Students acquire understanding of the basic medical sciences and clinical disciplines, and are encouraged to choose their own areas of interest for eventual development into careers in the broadly diversified medical community.

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 basic science departments and

Scripps Institution of Oceanography 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.

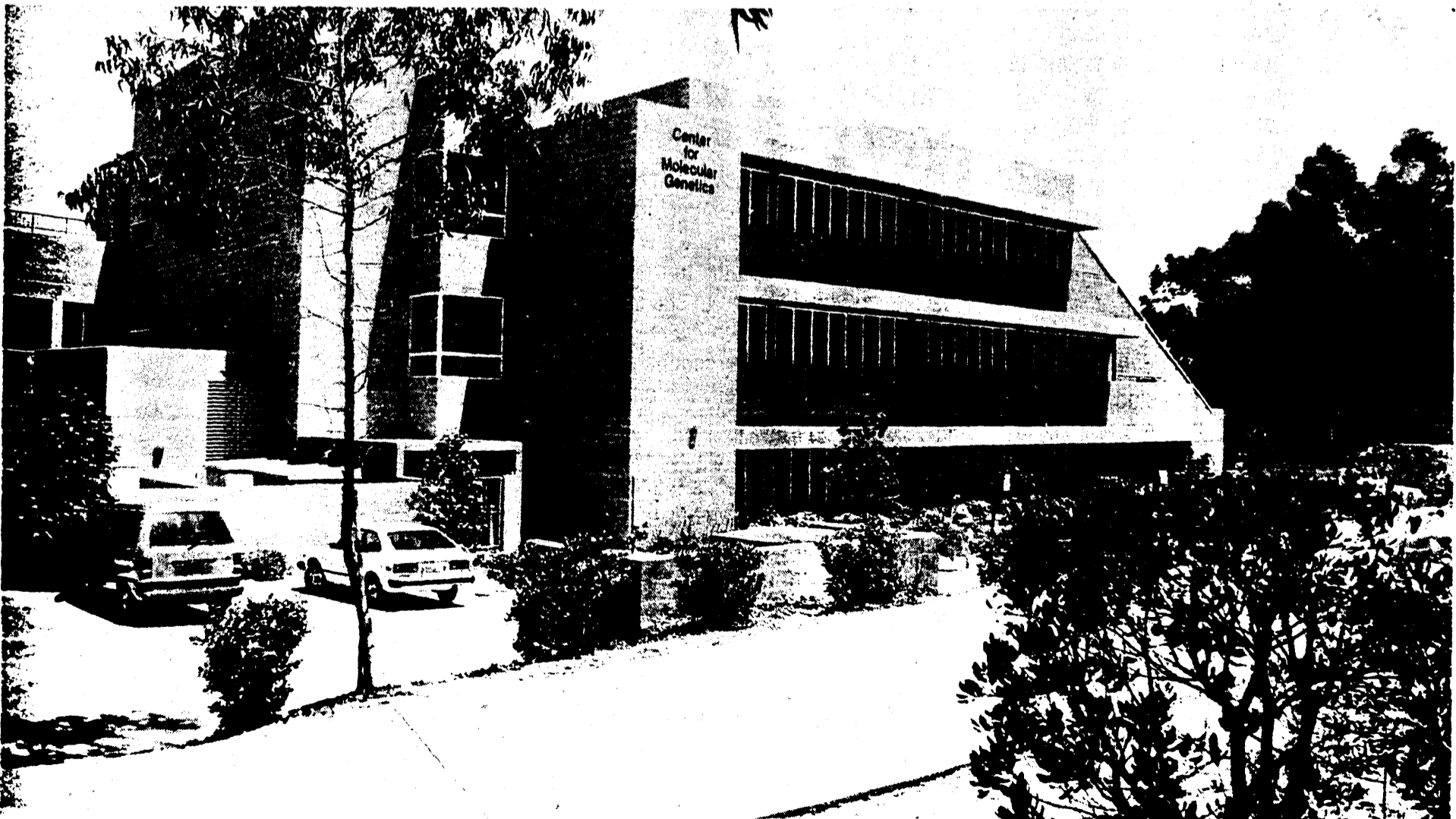
Students at the UCSD School of Medicine are encouraged to explore a variety of clinical and laboratory experiences.

Outpatient experiences include private, solo, and group 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 poorest neighborhoods of San Diego and Baja California, Mexico.

UCSD facilities are the main sites for clinical education. UCSD Medical Center is licensed for 459 beds. The majority of UCSD inpatients are admitted to UCSD Medical Center-Hillcrest, where the San Diego Regional Burn Center and Poison Center are located. It also is the location of San Diego and Imperial Counties' only Level I Trauma Center. The UCSD Ambulatory Care Center is located across the street from the UCSD Medical Center hospital tower.

In July 1993, a 120-bed general medical-surgical hospital, The John M. and Sally B. Thornton Hospital, will open at UCSD Medical Center-La Jolla which is located on the La Jolla campus. Adjacent to The Thornton Hospital will be the Perlman Ambulatory Care Center, also open in summer 1993. The Shiley Eye Center opened at this site in 1991.



The Veterans Administration Medical Center, located adjacent to the School of Medicine campus in La Jolla, also is an important training site.

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 the laboratories of UCSD School of Medicine and Medical Center researchers, as well as in the laboratories of scientists from the general UCSD campus, the Veterans Administration 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. degree 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 507 medical students were enrolled in 1992-93.

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 actively recruiting minority students who have shown determination to pursue careers in medicine and who have demonstrated personal promise for becoming dedicated physicians.

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 \$76.5 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 Re-

search Division, Geological 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 seven curricular groups: biological oceanography, physical oceanography, marine biology, geological sciences, geochemistry/marine chemistry, geophysics, and applied ocean sciences. Approximately eighty professors are complemented by an academic staff of more than 100 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, UC's California Space Institute, and UC's Institute of Marine Resources (IMR),

although organizationally separate, are closely affiliated with Scripps. In addition to its regular research programs, IMR administers the California Sea Grant College Program, with more than forty projects and approximately forty-five trainees supported on California campuses and in several specialized research units. The Southwest Fisheries Center (SWFC), 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, SWFC is the headquarters for the Inter-American Tropical Tuna Commission.

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. The Satellite Oceanography Center enables researchers to receive and process satellite imagery from earth-orbiting satellites. Among the many computer resources is access to the San Diego Supercomputer Center. The Scripps Library is the University of California's major

SCRIPPS INSTITUTION OF OCEANOGRAPHY

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:

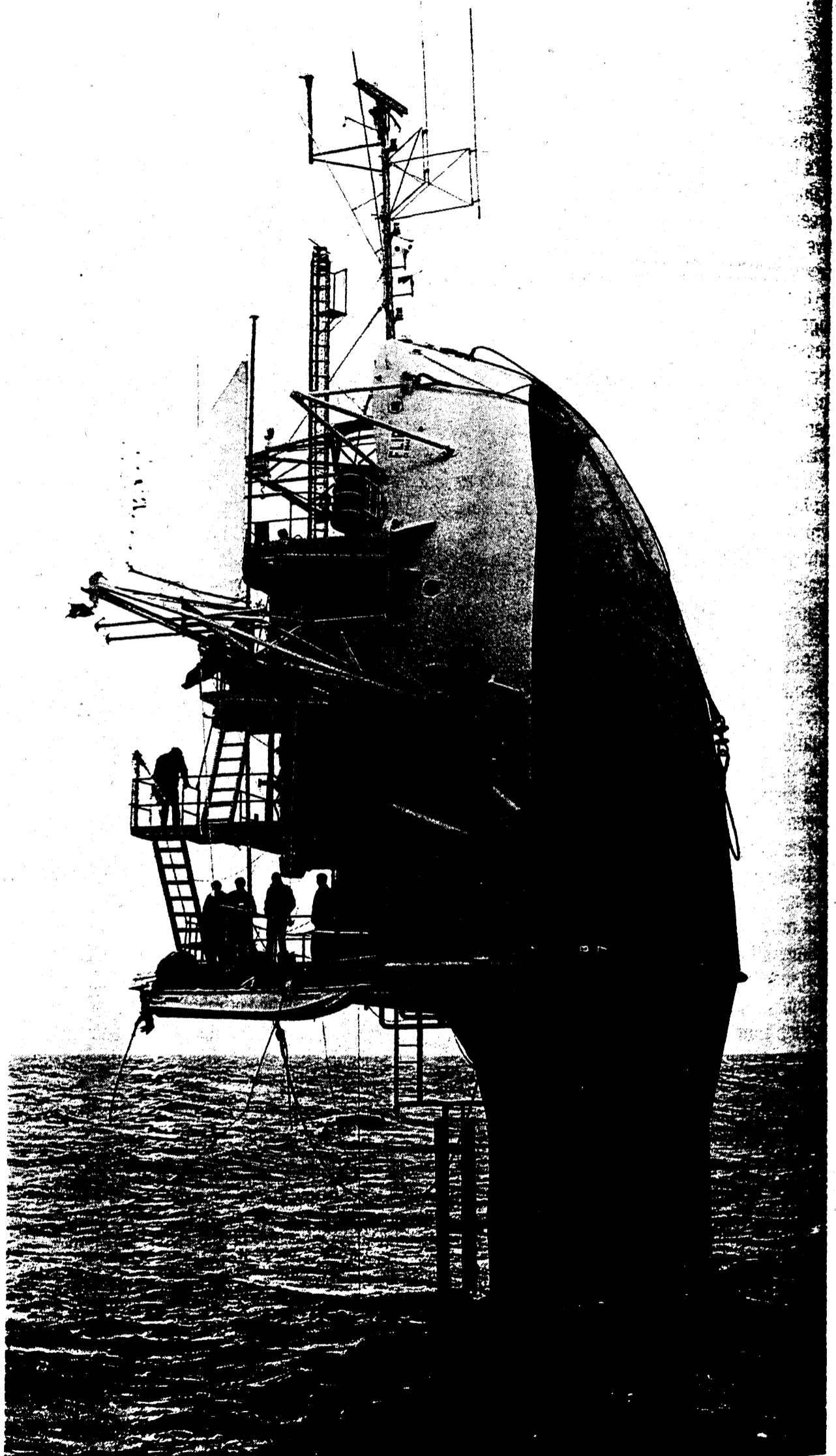
Graduate Student Information

Scripps Institution of Oceanography, 0208

University of California, San Diego

La Jolla, California 92093-0208

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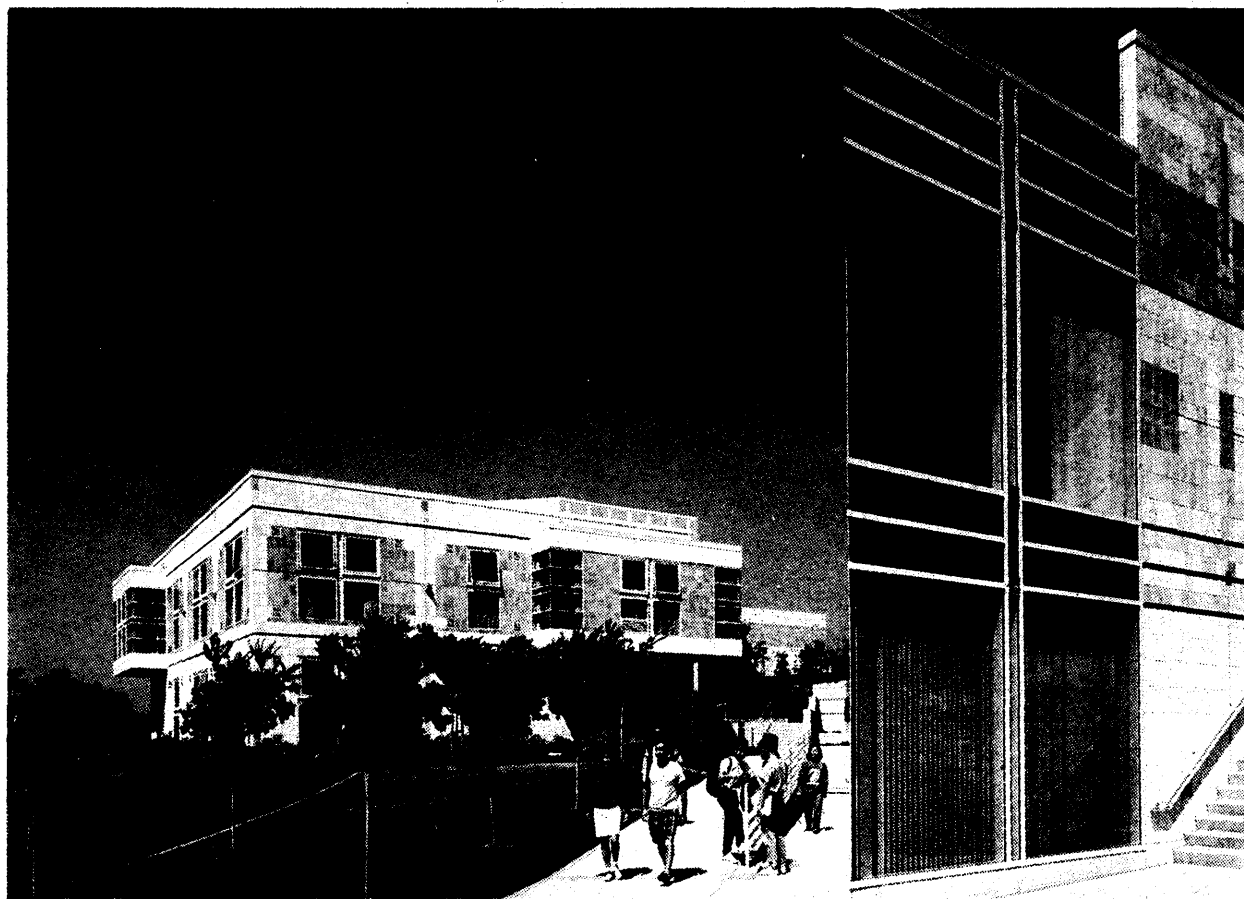
GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

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's degree in Pacific international affairs (M.P.I.A.) and a doctor of philosophy in international affairs. Training emphasizes international relations, economics and management, knowledge of specific countries or regions, analytical and research skills, and foreign language.

Mid-career and other professional development 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 train-

ing 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 socio-economic development among the countries of Asia and Latin America, including the exploration of differences and similarities in state-society relations, culture, entrepreneurship, link-

age to the global economy, and geopolitical position.

4. Comparative analysis of patterns of policymaking in the countries of the Pacific region to understand how different governmental structures, economic systems, and social group interests shape the policy process and influence policy choices in such areas as budget allocation, regulation of industry, and foreign trade.

For further information, contact the Office of Admissions, Graduate School of International Relations and Pacific Studies, UCSD, 9500 Gilman Drive, La Jolla, CA 92093-0520. (619) 534-5914.

SCHOOL OF ARCHITECTURE

The University of California Board of Regents has approved the establishment of a School of Architecture on the San Diego campus, making it the third UC campus, along with Berkeley and Los Angeles, to have a school of architecture. In his announcement of the school, Chancellor Atkinson said, "The school will provide an exciting and stimulating environment for undergraduate and graduate students alike. It will also provide innovative advances in design and engineering that will contribute to architecture in San Diego and the world community."

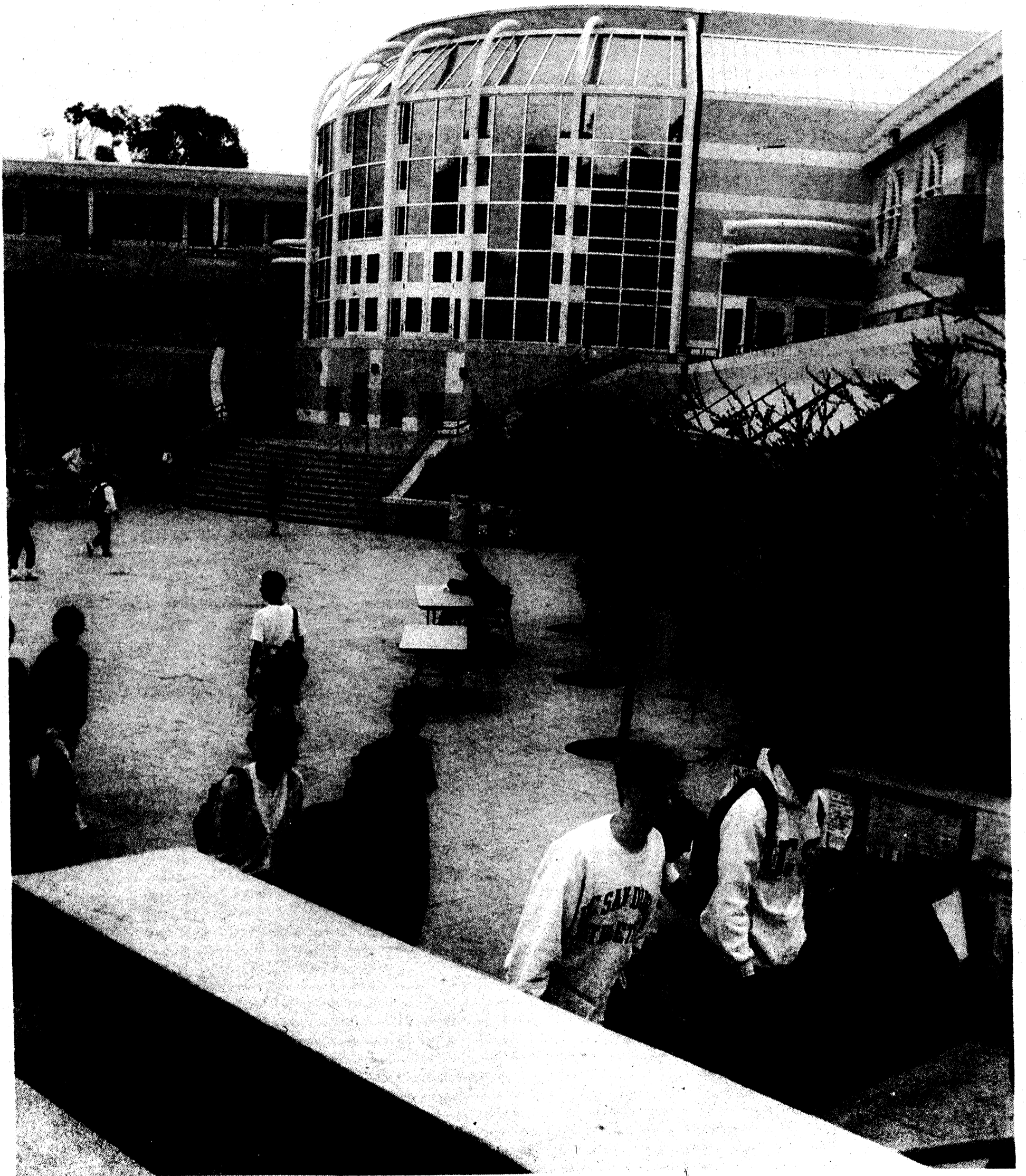
Adèle Naudé Santos, noted architect and educator, has been appointed founding dean of the school. Her mission is to create a new model for architectural education, one that is more responsive to the changing social, environmental, and technical issues facing the architectural profession. "I believe it is time for a school to address the realities of the world our students will inherit and to prepare them to play a relevant role within it," says Santos. "The school will be research based, and the research will set the intellectual tone for the curriculum and give meaning to the education of our students." Students and faculty will explore architectural issues of both regional and global scale, and the school should be an international forum for exchange of ideas.

Classes began in fall 1992, and the following degree programs are approved: master of architecture I and II; and an M.S. in architectural studies. A bachelor of arts with a major in architecture is planned for 1995-96, and a small Ph.D. program should be in place by 1996-97.

The undergraduate program will provide students with a challenging liberal arts major with emphasis in architectural studies. The goal of the master's programs is to train students to bring intelligence, imagination, and sensitivity to the design of the built environment and to provide graduates with a foundation for a lifetime of learning.

Students interested in the programs should contact the School of Architecture for current information.





UCSD FACULTY MEMBERS

NAME	TITLE	DEPARTMENT	COLLEGE
Abarbanel, Henry D. I.	Professor	Physics	Revelle
Abramson, Ian S.	Associate Professor	Mathematics	Muir
Ackerman, Farrell	Assistant Professor	Linguistics	Third
Adler, Steven	Lecturer (SOE)	Theatre	Fifth
Agler, Jim	Associate Professor	Mathematics	Muir
Agnew, Duncan C.	Professor	SIO	SIO
Agre, Philip E.	Assistant Professor	Communication	Muir
Alexander, Nicholas M.	Professor Emeritus	Pathology	SchMed
Alfven, Hannes	Professor Emeritus	ECE	Muir
Algaze, Guillermo	Associate Professor	Anthropology	Fifth
Allison, Henry E.	Professor	Philosophy	Revelle
Allison, William S.	Professor	Chemistry	SchMed
Anagnostopoulos, Georgios H.	Professor	Philosophy	Warren
Ancoli-Israel, Sonia	Associate Professor-in-Res	Psychiatry	SchMed
Anderson, Donald W.	Professor/Dean	Mathematics/Natural Sciences	Muir
Anderson, Norman H.	Professor	Psychology	Muir
Anderson, Victor C.	Professor Emeritus	ECE	SIO/Muir
Anstis, Stuart	Professor	Psychology	Fifth
Antin, David A.	Professor Emeritus	Visual Arts	Muir
Antin, Eleanor	Professor	Visual Arts	Muir
Armi, Laurence	Professor	SIO	SIO
Arneson, Richard J.	Professor	Philosophy	Third
Arnold, James R.	Professor Emeritus	Chemistry	Revelle/SIO
Arovas, Daniel P.	Associate Professor	Physics	Revelle
Arrhenius, Gustaf	Professor	SIO	SIO
Arthur, Robert S.	Professor Emeritus	SIO	SIO
Asaro, Robert J.	Professor	AMES	Revelle
Asbeck, Peter M.	Professor	ECE	Third
Atkinson, Richard C.	Professor/Chancellor	Psychology	Third
Attiyeh, Richard E.	Professor/Dean	Economics/Graduate Studies	Revelle
Azam, Farooq	Professor-in-Residence	SIO	SIO
Backus, George E.	Professor	SIO	SIO
Bada, Jeffrey L.	Professor	SIO	SIO/Revelle
Baden, Scott B.	Assistant Professor	CSE	Warren
Bailey, Frederick G.	Professor	Anthropology	Muir
Baird, Stephen M.	Professor of Clinical Pathology	Pathology	SchMed
Balzano, Gerald J.	Associate Professor	Music	Muir
Bank, Randolph E.	Professor	Mathematics	Warren
Baouendi, M. Salah	Professor	Mathematics	Warren
Barrett, Kim E.	Associate Professor-in-Res	Medicine	SchMed
Bartlett, Douglas H.	Assistant Professor	SIO	SIO
Batali, John D.	Assistant Professor	Cognitive Sciences	Warren
Batchen, Geoffrey	Assistant Professor	Visual Arts	Third
Bates, Elizabeth A.	Professor	Cognitive Science/Psychology	Third
Baylis, Gordon C.	Assistant Professor	Psychology	Third
Bear, Donald V. T.	Professor	Economics	Revelle
Beck, Nathaniel L.	Associate Professor	Political Science	Warren
Behar, Jack	Associate Professor Emeritus	Literature	Revelle
Belew, Richard K.	Assistant Professor	CSE	Third
Belgrader, Andrei	Professor	Theatre	Muir

UCSD FACULTY MEMBERS

Bender, Edward A.	Professor	Mathematics	Muir
Benirschke, Kurt	Professor	Reproductive Med/Pathology	SchMed
Benson, Andrew A.	Professor Emeritus	SIO	SIO
Benson, David J.	Associate Professor	AMES	Third
Berg, Darwin K.	Professor	Biology	Warren
Berger, Bennett M.	Professor Emeritus	Sociology	Muir
Berger, Wolfgang H.	Professor	SIO	SIO
Berkowitz, Ami E.	Professor	Physics	Warren
Berman, Francine D.	Associate Professor	CSE	Revelle
Berman, Ronald S.	Professor	Literature	Muir
Bernstein, Michael A.	Associate Professor	History	Warren
Bertram, H. Neal	Professor	ECE	Revelle
Betts, Julian	Assistant Professor	Economics	Third
Bevilacqua, Michael P.	Associate Professor	Pathology	SchMed
Bickford, Reginald G.	Professor Emeritus	Neurosciences	SchMed
Bien, Frederic	Assistant Professor	Mathematics	Third
Bier, Ethan	Assistant Professor	Biology	Fifth
Biernacki, Richard	Assistant Professor	Sociology	Muir
Blanco, Carlos	Professor	Literature	Third
Blantz, Roland C.	Professor	Medicine	SchMed
Bloor, Colin M.	Professor	Pathology	SchMed
Blumberg, Rae L.	Professor	Sociology	Third
Bohn, Roger E.	Assistant Professor	IRPS	IRPS
Bond, F. Thomas	Associate Professor/Provost	Chemistry/Revelle	Revelle
Borjas, George J.	Professor	Economics	Third
Both, Andrei	Associate Professor	Theatre	Third
Bowles, Kenneth L.	Professor Emeritus	CSE	Muir
Boynton, Robert M.	Professor Emeritus	Psychology	Fifth
Brace, Robert A.	Professor	Reproductive Medicine	SchMed
Bradbury, Jack W.	Professor	Biology	Muir
Bradner, Hugh	Professor Emeritus	AMES	Revelle/SIO
Braff, David L.	Professor	Psychiatry	SchMed
Branson, James G.	Professor	Physics	Third
Brenner, Suzanne A.	Assistant Professor	Anthropology	Warren
Brian, Adrienne A.	Assistant Professor	Chemistry	Warren
Bridges, Amy	Associate Professor	Political Science	Third
Britton, Karen T.	Professor-in-Residence	Psychiatry	SchMed
Brodsky, Linda	Associate Professor	Literature	Warren
Brody, Stuart	Professor	Biology	Muir
Brown, Joan Heller	Professor	Pharmacology	SchMed
Brown, Kevin M.	Assistant Professor	SIO	SIO
Brown, Marvin R.	Professor-in-Residence	Medicine/Surgery	SchMed
Brown, Sandra A.	Associate Professor-in-Res	Psychiatry	SchMed
Brown, Sheldon G.	Assistant Professor	Visual Arts	Warren
Brown, Willie C.	Associate Professor	Biology	Third
Brueckner, Keith A.	Professor Emeritus	Physics	Revelle
Brunton, Laurence L.	Associate Professor	Pharmacology/Medicine	SchMed
Buckingham, Michael J.	Acting Professor	SIO	SIO
Bullock, Theodore H.	Professor Emeritus	Neurosciences	SchMed/SIO
Bunch, James R.	Professor	Mathematics	Warren
Burbidge, E. Margaret	Professor Emeritus	Physics	Revelle
Burbidge, Geoffrey R.	Professor	Physics	Revelle
Burkhard, Walter A.	Professor	CSE	Warren
Burton, Ronald S.	Associate Professor	SIO	SIO
Buss, Samuel R.	Associate Professor	Mathematics	Fifth
Butters, Nelson M.	Professor-in-Residence	Psychiatry	SchMed

Cancel, Robert	Associate Professor	Literature	Third
Cande, Steven C.	Professor	SIO	SIO
Carmody, James	Associate Professor	Theatre	Warren
Carson, Richard T.	Associate Professor	Economics	Muir
Casalduero, Joaquin	Professor Emeritus	Literature	Revelle
Case, Ted J.	Professor	Biology	Revelle
Caserio, Marjorie C.	Professor/Vice Chancellor	Chemistry/Acad. Affairs	Third
Cassedy, Steven D.	Professor	Literature	Fifth
Castillo, Paterno E.	Assistant Professor	SIO	SIO
Catalan, Diego	Professor Emeritus	Literature	Revelle
Catanzarite, Lisa M.	Assistant Professor	Sociology	Third
Cattolica, Robert J.	Professor	AMES	Warren
Cavane, Webster K.	Professor	Medicine	SchMed
Cespedes, Guillermo	Professor Emeritus	History	Revelle
Chang, William S. C.	Professor	ECE	Warren
Charles, Christopher D.	Assistant Professor	SIO	SIO
Charles, Maria	Assistant Professor	Sociology	Muir
Chatterjee, Shankar	Assistant Professor	ECE	Warren
Chau, Pao C.	Associate Professor	AMES	Revelle
Chau, Paul M.	Assistant Professor	ECE	Revelle
Cheatham, James R.	Sr. Lecturer (SOE) Emeritus	Music	Third
Checkley, David M.	Associate Professor	SIO	SIO
Cheeks, Teresa L.	Assistant Professor	ECE	Warren
Chen, Joseph C. Y.	Professor	Physics	Fifth
Chen, Matthew Y. C.	Professor	Linguistics	Muir
Chen, Pojen P.	Associate Professor-in-Res	Medicine/Pathology	SOM
Cheng, Chung-Kuan	Associate Professor	CSE	Muir
Cheng, Tun-jen	Assistant Professor	IRPS	IRPS/Fifth
Chien, Kenneth R.	Professor	Medicine	SchMed
Chien, Shu	Professor	AMES	SchMed
Chodorow, Stanley A.	Professor/Dean	History/Arts and Humanities	Revelle
Chojkier, Mario	Associate Professor-in-Res	Medicine	SOM
Chokshi, Atul H.	Associate Professor	AMES	Fifth
Chrispeels, Maarten J.	Professor	Biology	Muir
Christenfeld, Nicholas	Assistant Professor	Psychology	Fifth
Christmas, Eric C.	Professor Emeritus	Theatre	Muir
Chun, Jerold J. M.	Assistant Professor	Pharmacology	SchMed
Churchland, Patricia S.	Professor	Philosophy	Muir
Churchland, Paul M.	Professor	Philosophy	Warren
Cicourel, Aaron V.	Professor	Cog. Sci./Sociology/Pediatrics	Revelle/SchMed
Clark, Leigh B.	Professor	Chemistry	Revelle
Clementz, Brett A.	Assistant Professor	Psychology	Third
Cohen, Alain J. J.	Professor	Literature	Muir
Cohen, Harold	Professor	Visual Arts	Muir
Cole, Michael	Professor	Communication	Fifth
Coles, William A.	Professor	ECE	Muir
Comisso, Ellen T.	Professor	Political Science	Fifth
Concha, Jaime	Professor	Literature	Muir
Conlisk, John	Professor	Economics	Revelle
Constable, Catherine G.	Assistant Professor	SIO	SIO
Continetti, Robert E.	Assistant Professor	Chemistry	Warren
Cooper, Charles R.	Professor	Literature	Third
Cornelius, Wayne A.	Professor	Political Science	Fifth
Cornell, Stephen E.	Associate Professor	Sociology	Fifth
Corrigan, Mary K.	Associate Professor Emeritus	Theatre	Warren
Cottrell, Garrison W.	Assistant Professor	CSE	Revelle

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Courchesne, Eric	Professor	Neurosciences	SchMed
Covell, James W.	Professor	Medicine	SchMed
Cowhey, Peter F.	Professor	Political Science/IRPS	Warren
Cox, Charles S.	Professor Emeritus	SIO	SIO
Cox, Gary W.	Professor	Political Science	Muir
Cox, Stephen D.	Professor	Literature	Revelle
Craig, Ann L.	Associate Professor	Political Science	Muir
Craig, Harmon	Professor	SIO	Revelle/SIO
Crawford, Nigel	Assistant Professor	Biology	Warren
Crawford, Vincent P.	Professor	Economics	Warren
Cristian, Flaviu	Professor	CSE	Third
Crowell, John E.	Assistant Professor	Chemistry	Revelle
Crowne, David K.	Associate Professor Emeritus	Literature	Revelle
Cruz, Rene L.	Assistant Professor	ECE	Third
Cuff, Dana L.	Associate Professor	Architecture	SchArch
Curiel, Anthony	Assistant Professor	Theatre	Third
Curry, Joseph R.	Professor Emeritus	SIO	SIO
Curtis, William J. R.	Professor	Architecture	SchArch
Cussins, Adrian	Assistant Professor	Philosophy	Fifth
D'Andrade, Roy G.	Professor	Anthropology	Fifth
Dashen, Roger F.	Professor	Physics	Muir
Davidson, R. Michael	Professor	Literature	Revelle
Davis, Charles E.	Professor	Pathology/Medicine	SchMed
Davis, Fred	Professor Emeritus	Sociology	Warren
Davis, Russ E.	Professor	SIO	SIO
Davis, Susan G.	Associate Professor	Communication	Warren
Dayton, Paul K.	Professor	SIO	SIO
Deak, Frantisek, J.	Professor	Theatre	Warren
Delis, Dean C.	Associate Professor-in-Res	Psychiatry	SchMed
denHaan, Wouter	Assistant Professor	Economics	Third
Dennis, Edward A.	Professor	Chemistry	Revelle/SchMed
Deutsch, Diana	Professor	Psychology	Warren
Deutsch, J. Anthony	Professor	Psychology	Muir/SchMed
Deverell, William F.	Assistant Professor	History	Third
Diamond, Patrick H.	Professor	Physics	Fifth
Diez-Medrano, Juan	Assistant Professor	Sociology	Third
Dijkstra, Abraham J.	Professor	Literature	Revelle
Dilling, Margaret W.	Assistant Professor	Music	Third
Dillmann, Wolfgang H.	Professor	Medicine	SchMed
Dimsdale, Joel E.	Professor-in-Residence	Psychiatry	SchMed
Dionne, Vincent E.	Professor	Pharmacology	SchMed
Donoghue, Daniel J.	Professor	Chemistry	Revelle/SchMed
Doolittle, Russell F.	Professor	Biology/Chemistry	Revelle/SchMed
Doppelt, Gerald D.	Professor	Philosophy	Warren
Dorman, LeRoy M.	Professor	SIO	SIO
Douglas, Jack D.	Professor Emeritus	Sociology	Muir
Doyle, Peter G.	Professor	Mathematics	Warren
Drake, Paul W.	Professor	Political Science	Fifth
Drake, William J.	Assistant Professor	Communication	Fifth
Driver, Bruce K.	Assistant Professor	Mathematics	Third
Dryden, Deborah M.	Professor	Theatre	Muir
Dubin, Daniel H.	Assistant Professor	Physics	Muir
duBois, Page A.	Professor	Literature	Muir
Dunseath, Thomas K.	Associate Professor Emeritus	Literature	Revelle
Duntley, Seibert Q.	Professor Emeritus	SIO	SIO
Dutton, Richard W.	Professor	Biology	SchMed

Dymond, Patrick	Associate Professor	CSE	Warren
Dynes, Robert C.	Professor	Physics	Warren
Ebbesen, Ebbe B.	Professor	Psychology	Muir
Edelman, Robert S.	Associate Professor	History	Revelle
Edwards, Anthony	Associate Professor	Literature	Third
Elkan, Charles P.	Assistant Professor	CSE	Revelle
Ellisman, Mark H.	Professor	Neurosciences	SchMed
Elman, Jeffrey L.	Professor	Cognitive Science/Linguistics	Muir
Emr, Scott	Professor	Medicine	SchMed
Engel, Albert E. J.	Professor Emeritus	SIO	SIO
Engestrom, Yrjo H.	Acting Professor	Communication	Third
Engle, Robert F.	Professor	Economics	Third
Enright, James T.	Professor	SIO	SIO
Enright, Thomas J.	Professor	Mathematics	Third
Erickson, Gregory F.	Professor	Reproductive Medicine	SchMed
Erickson, Robert	Professor Emeritus	Music	Muir
Erie, Steven P.	Associate Professor	Political Science	Third
Esener, Sadik C.	Associate Professor	ECE	Warren
Esherick, Joseph	Professor	History	Fifth
Espiritu, Yen	Assistant Professor	Ethnic Studies	Third
Evans, Ivan T.	Assistant Professor	Sociology	Fifth
Evans, John W.	Professor	Mathematics	Muir/SchMed
Evans, Ronald J.	Professor	Mathematics	Third
Fagin, Steve	Associate Professor	Visual Arts	Third
Fahey, Robert C.	Professor	Chemistry	Revelle
Fainman, Yeshaiahu	Associate Professor	ECE	Warren
Fanestil, Darrell D.	Professor	Medicine	SchMed
Fantino, Edmund J.	Professor	Psychology	Muir
Farber, Manny	Professor Emeritus	Visual Arts	Muir
Farrell, Peter	Professor Emeritus	Music	Warren
Fauconnier, Gilles R.	Professor	Cognitive Science	Third
Faulkner, D. John	Professor	SIO	SIO/Revelle
Feher, George	Professor Emeritus	Physics	Revelle
Fejer, Jules A.	Professor Emeritus	ECE	Muir
Felbeck, Horst	Associate Professor	SIO	SIO
Fellman, Ronald D.	Assistant Professor	ECE	Fifth
Fenical, William H.	Professor-in-Residence	SIO	SIO
Fenner-Lopez, Claudio E.	Lecturer (SOE)	Visual Arts/Communication	Third
Feramisco, James R.	Professor	Medicine/Pharmacology	SchMed
Ferneyhough, Brian J.P.	Professor	Music	Third
Fierer, Joshua	Professor-in-Residence	Medicine/Pathology	SchMed
Fillmore, Jay P.	Professor	Mathematics	Muir
Firtel, Richard A.	Professor	Biology	Revelle
Fisk, Zachary	Professor	Physics	Muir
FitzGerald, Carl H.	Professor	Mathematics	Revelle
Fitzgerald, William C.	Associate Professor	Literature	Warren
Fitzsimmons, Patrick J.	Professor	Mathematics	Third
Flavin, Marjorie	Associate Professor	Economics	Fifth
Fonville, John W.	Associate Professor	Music	Revelle
Foote, Stephen L.	Professor-in-Residence	Psychiatry	SchMed
Forbes, Douglass Jane	Associate Professor	Biology	Muir
Fortes, P. A. George	Associate Professor	Biology	Third
Foster, Frances S.	Professor	Literature	Warren
Frank, Ross H.	Assistant Professor	Ethnic Studies	Third
Frankel, Theodore T.	Professor Emeritus	Mathematics	Revelle

UCSD FACULTY MEMBERS

Franks, Peter J. S.	Assistant Professor	SIO	SIO
Fredkin, Donald R.	Professor	Physics	Revelle
Fredman, Michael L.	Professor	Mathematics	Warren
Freedman, David Noel	Professor	History	Revelle
Freedman, Michael H.	Professor	Mathematics	Revelle
Frenk, Margit	Professor Emeritus	Literature	Third
Friedkin, Morris E.	Professor Emeritus	Biology	Revelle/SchMed
Friedman, Richard E.	Professor	Literature	Muir
Friedman, Robert Marc	Associate Professor	History	Warren
Friedmann, Theodore	Professor	Pediatrics	SchMed
Frieman, Edward A.	Prof/V Chan/Dean/Dir	SIO/Mar Sci/SIO/SIO	SIO
Fu, Xiang-Dong	Assistant Professor	Medicine	SchMed
Fujitani, Takashi	Assistant Professor	History	Fifth
Fuller, George M.	Professor	Physics	Fifth
Fung, Yuan-Cheng B.	Professor Emeritus	AMES	Revelle/SchMed
Fussell, Edwin S.	Professor Emeritus	Literature	Muir
Gaffney, Floyd	Professor	Theatre	Third
Gage, Fred H.	Professor	Neurosciences	SchMed
Galambos, Robert	Professor Emeritus	Neurosciences	SchMed
Galbraith, John S.	Professor Emeritus	History	Revelle
Garsia, Adriano M.	Professor	Mathematics	Revelle/SchMed
Geiduschek, E. Peter	Professor	Biology	SchMed/Fifth
George, Rosemary M.	Assistant Professor	Literature	Fifth
Getoor, Ronald K.	Professor	Mathematics	Revelle/SchMed
Geyer, Mark A.	Professor-in-Residence	Psychiatry	SchMed
Gheissari, Ali	Assistant Professor	Sociology	Third
Gibson, Carl H.	Professor	AMES/SIO	Revelle/SIO
Gleskes, Joris M.T.M.	Professor	SIO	SIO
Gilbert, J. Freeman	Professor	SIO	SIO
Gill, Gordon N.	Professor	Medicine	SchMed
Gill, Philip E.	Professor	Mathematics	Third
Gillin, J. Christian	Professor	Psychiatry	SchMed
Gilpin, Michael E.	Professor	Biology	Muir
Goddard, Joseph D.	Professor	AMES	Third
Goldberg, Edward D.	Professor	SIO	SIO
Goldman, Harvey S.	Associate Professor	Sociology	Third
Gonzalez, Manuel F.	Assistant Professor	Psychology	Revelle
Goodblatt, David	Professor	History	Muir
Goodkind, John M.	Professor	Physics	Revelle
Goodman, Judith C.	Assistant Professor	Psychology	Revelle
Goodman, Murray	Professor	Chemistry	Revelle
Gorin, Jean-Pierre	Professor	Visual Arts	Third
Gough, David A.	Professor	AMES	Third
Gould, Robert J.	Professor	Physics	Revelle
Goulian, Mehran	Professor	Medicine	SchMed
Gourevitch, Peter A.	Professor/Dean	Political Science/IRPS	IRPS/Fifth
Granger, Clive W. J.	Professor	Economics	Warren
Grant, Igor	Professor	Psychiatry	SchMed
Green, Melvin H.	Professor	Biology	Revelle
Greenstein, Jack M.	Associate Professor	Visual Arts	Muir
Griest, Kim	Assistant Professor	Physics	Fifth
Griswold, William G.	Assistant Professor	CSE	Warren
Grobstein, Clifford	Assistant Professor	Biology	Revelle/SchMed
Groves, Philip M.	Professor Emeritus	Psychiatry/Neurosciences	SchMed
Groves, Theodore	Professor	Economics	Revelle
Guasch, J. Luis	Associate Professor	Economics	Fifth

Guest, Clark C.	Associate Professor	ECE	Warren
Gusfield, Joseph R.	Professor Emeritus	Sociology	Muir
Gutierrez, David G.	Assistant Professor	History	Warren
Gutierrez, Ramon A.	Professor	Ethnic Studies/History	Third
Guza, Robert T.	Professor	SIO	SIO
Haas, Richard H.	Associate Professor	Neurosci/Pathol/Pediatrics	SchMed
Haff, Leonard R.	Professor	Mathematics	Third
Haggard, Stephan M.	Professor	IRPS	IRPS
Hahn, Steven	Professor	History	Muir
Haiman, Mark D.	Assistant Professor	Mathematics	Fifth
Halberstam, Judith M.	Assistant Professor	Literature	Revelle
Halkin, Hubert	Professor	Mathematics	Revelle
Halleck, DeeDee	Associate Professor	Communication	Warren
Hallin, Daniel C.	Associate Professor	Communication	Third
Halpern, Francis R.	Professor Emeritus	Physics	Muir
Hamburger, Robert N.	Professor Emeritus	Pediatrics	Revelle/SchMed
Hamilton, James D.	Professor	Economics	Fifth
Hamilton, Richard S.	Professor	Mathematics	Warren
Hammel, Harold T.	Professor Emeritus	SIO	SIO/SchMed
Harkins, Edwin L.	Professor	Music	Muir
Harper, Elvin	Professor	Chemistry	Third
Harris, William A.	Professor	Biology	Third
Harrison, Helen M.	Professor	Visual Arts	Fifth
Harrison, Newton A.	Professor Emeritus	Visual Arts	Fifth
Hartouni, Valerie A.	Assistant Professor	Communication	Muir
Harvey, Daniel F.	Assistant Professor	Chemistry	Third
Haubrich, Richard A.	Professor Emeritus	SIO	SchMed
Hauger, Richard L.	Associate Professor-in-Res	Psychiatry	SchMed
Havis, Allan	Assistant Professor	Theatre	Muir
Hawkins, James W.	Professor	SIO	Revelle/SIO
Haxo, Francis T.	Professor Emeritus	SIO	SIO
Hayashi, Masaki	Professor Emeritus	Biology	Revelle
Haydu, Jeffrey M.	Associate Professor	Sociology	Fifth
Haygood, Margo G.	Assistant Professor	SIO	SIO
Heaton, Robert K.	Professor	Psychiatry	SchMed
Hedrick, Stephen M.	Professor	Biology	Third
Hegemier, Gilbert A.	Professor	AMES	Revelle
Heiligenberg, Walter F.	Professor	SIO	SIO
Helinski, Donald R.	Professor	Biology	Third
Heller, Walter P.	Professor	Economics	Revelle
Hellman, Frances	Assistant Professor	Physics	Third
Helstrom, Carl W.	Professor Emeritus	ECE	Muir
Helton, John W.	Professor	Mathematics	Third
Henaff, Marcel	Acting Professor	Literature	Warren
Hendershott, Myrl C.	Professor	SIO	SIO
Hendrickson, David N.	Professor	Chemistry	Muir
Herbert, Timothy D.	Assistant Professor	SIO	SIO
Herz, Richard K.	Associate Professor	AMES	Warren
Hessler, Robert R.	Professor	SIO	SIO
Hildebrand, John A.	Associate Professor	SIO	SIO
Hillyard, Steven A.	Professor	Neurosciences	SchMed
Hirsch, Harry N.	Professor	Political Science	Warren
Hirsch, Jorge E.	Professor	Physics	Revelle
Hock, Louis J.	Professor	Visual Arts	Third
Hodgetts, Craig	Professor	Architectre	SchArch
Hodgkiss, William S., Jr.	Professor	SIO	SIO

UCSD FACULTY MEMBERS

Hoffman, Nicole
 Hofmann, Alan F.
 Hoger, Anne
 Holland, John J.
 Holland, Nicholas D.
 Holmgren, Beth
 Holston, James
 Holt, Christine E.
 Horwitz, Robert B.
 Hoshi, Takeo
 Hoston, Germaine A.
 Houston, Alan C.
 Howden, William E.
 Howe, Fanny Q.
 Howell, Stephen B.
 Hu, Ping C.
 Hu, Te C.
 Huerta, Jorge A.
 Hughes, H. Stuart
 Hughes, Judith M.
 Hunefeldt, Christine F.
 Hutchins, Edwin L.

Assistant Professor
 Professor
 Assistant Professor
 Professor Emeritus
 Professor
 Assistant Professor
 Assistant Professor
 Assistant Professor
 Associate Professor
 Assistant Professor
 Professor
 Assistant Professor
 Professor
 Professor
 Lecturer (SOE)
 Professor
 Professor
 Professor Emeritus
 Professor
 Assistant Professor
 Professor

Literature
 Medicine
 AMES
 Biology
 SIO
 Literature
 Anthropology
 Biology
 Communication
 IRPS
 Political Science
 Political Science
 CSE
 Literature
 Medicine
 History
 CSE
 Theatre
 History
 History
 History
 Cognitive Science

Fifth
 SchMed
 Warren
 Warren
 SIO/Revelle
 Warren
 Warren
 Third
 Third
 IRPS/Fifth
 Revelle
 Fifth
 Muir
 Warren
 SchMed
 Muir
 Warren
 Third
 Revelle
 Fifth
 Third
 Third

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Ierley, Glenn R.
 Impagliazzo, Russell
 Inman, Douglas L.
 Insel, Paul A.
 Intaglietta, Marcos
 Iragui-Madoz, Vicente J.
 Irons, Peter H.
 Irwin, Michael

Professor
 Assistant Professor
 Professor Emeritus
 Professor
 Professor
 Prof of Clin Neurosciences
 Professor
 Associate Professor-in-Res

SIO
 CSE
 SIO
 Pharmacology/Medicine
 AMES
 Neurosciences
 Political Science
 Psychiatry

SIO
 Third
 SIO
 SchMed
 Revelle/SchMed
 SchMed
 Warren
 SchMed

Jackson, Gabriel
 Jacobson, Gary C.
 Jain, Ramesh
 James, Luther
 Jed, Stephanie H.
 Jenkins, Elizabeth
 Jernigan, Terry L.
 Jeste, Dilip V.
 Johnson, Chalmers
 Jolley, S. Nicholas
 Jones, Barbara
 Jones, Walton
 Jordan, David K.
 Judd, Lewis L.
 Jules-Rosette, Bennetta W.

Professor Emeritus
 Professor
 Professor
 Associate Professor Emeritus
 Associate Professor
 Assistant Professor
 Associate Professor-in-Res
 Professor-in-Residence
 Professor Emeritus
 Professor
 Professor
 Professor
 Professor
 Professor
 Professor

History
 Political Science
 ECE
 Theatre
 Literature
 Physics
 Psychiatry/Radiology
 Psychiatry/Neurosciences
 IRPS
 Philosophy
 Physics
 Theatre
 Anthropology
 Psychiatry
 Sociology

Revelle
 Third
 Fifth
 Muir
 Muir
 Muir
 SchMed
 SchMed
 IRPS/Fifth
 Revelle
 Muir
 Muir
 Revelle
 SchMed
 Muir

Kadonaga, James T.
 Kagnoff, Martin F.
 Kahler, Miles E.
 Kahr, Madlyn M.
 Kamen, Martin D.
 Kane, Alex
 Kaplan, David B.
 Kaplan, Robeart M.
 Kaprow, Allan

Associate Professor
 Professor
 Professor
 Professor Emeritus
 Professor Emeritus
 Professor
 Associate Professor
 Professor
 Professor Emeritus

Biology
 Medicine
 IRPS
 Visual Arts
 Chemistry
 IRPS
 Physics
 Com & Fam Medicine
 Visual Arts

Revelle
 SchMed
 IRPS/Fifth
 Warren
 Revelle
 IRPS/Fifth
 Third
 SchMed
 Warren



Karin, Michael	Professor	Pharmacology	SchMed
Karis, Aleck	Assistant Professor	Music	Warren
Karten, Harvey J.	Professor	Neurosciences/Psychiatry	SchMed
Kastner, Miriam	Professor	SIO	SIO/Revelle
Katzman, Robert	Professor	Neurosciences	SchMed
Kavanagh, Karen L.	Assistant Professor	ECE	Fifth
Kayali, Hasan	Assistant Professor	History	Fifth
Kearns, David R.	Professor Emeritus	Chemistry	Revelle
Keeling, Charles D.	Professor	SIO	SIO
Keeling, Ralph F.	Assistant Professor	SIO	SIO
Kelly, Carolyn J.	Associate Professor-in-Res	Medicine	SchMed
Kelner, Michael J.	Associate Professor	Pathology	SchMed
Kemmer, Suzanne E.	Assistant Professor	Linguistics	Third
Kernell, Samuel H.	Professor	Political Science	Warren
Keyssar, Helene	Professor	Communication	Third
Kim, Taekwon	Assistant Professor	IRPS	IRPS
Kipps, Thomas J.	Associate Professor	Medicine	SchMed
Kirkland, Theo N.	Associate Professor-in-Res	Pathology/Medicine	SchMed
Kirkpatrick, Susan	Professor	Literature	Muir
Kirsch, David J.	Assistant Professor	Cognitive Science	Fifth
Kitcher, Patricia W.	Professor	Philosophy	Revelle
Klatch, Rebecca E.	Associate Professor	Sociology	Muir
Kitcher, Philip S.	Professor	Philosophy	Revelle
Klein, Rachel	Associate Professor	History	Warren
Klima, Edward S.	Professor Emeritus	Linguistics	Muir
Kluender, Robert E.	Assistant Professor	Linguistics	Fifth
Ko, Dorothy	Assistant Professor	History	Muir
Kohn, Joshua R.	Assistant Professor	Biology	Warren
Komives, Elizabeth A.	Assistant Professor	Chemistry	Fifth/SchMed
Konecni, Vladimir J.	Professor	Psychology	Muir
Kontje, Todd C.	Assistant Professor	Literature	Third
Kooyman, Gerald L.	Professor-in-Residence	SIO	SIO
Kosmatka, John B.	Associate Professor	AMES	Warren
Krause, Lawrence	Professor	IRPS	IRPS/Fifth
Kraut, Joseph	Professor	Chemistry	Revelle
Kreutz-Delgado, Kenneth	Assistant Professor	ECE	Warren
Kripke, Daniel F.	Professor-in-Residence	Psychiatry	SchMed
Kristan, William B., Jr.	Professor	Biology	Third
Kroll, Norman M.	Professor Emeritus	Physics	Revelle
Kronick, Richard G.	Assistant Professor	Comm & Fam Medicine	SchMed
Ku, Walter H.	Professor	ECE	Revelle
Kube, Paul R.	Assistant Professor	CSE	Third
Kuczenski, Ronald T.	Professor-in-Residence	Psychiatry	SchMed
Kulik, James A.	Associate Professor	Psychology	Warren
Kummel, Andrew C.	Assistant Professor	Chemistry	Muir
Kuperman, William A.	Professor	SIO	SIO
Kuroda, Sige-Yuki	Professor	Linguistics	Muir
Kutas, Marta	Professor	Cognitive Science	Muir
Kuti, Julius G.	Professor	Physics	Third
Kyte, Jack E.	Professor	Chemistry	Warren
Lake, David A.	Professor	Political Science	Third
Lakoff, Sanford A.	Professor Emeritus	Political Science	Warren
Lal, Devendra	Professor	SIO	SIO
Lampland, Martha	Assistant Professor	Sociology	Fifth
Lane, Thomas A.	Professor	Pathology	SchMed
Langacker, Ronald W.	Professor	Linguistics	Revelle

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Langdon, Margaret H.	Professor Emeritus	Linguistics	Warren
Larson, Philip C.	Associate Professor	Music	Fifth
Lasheras, Juan C.	Professor	AMES	Third
Lau, Silvanus S.	Professor	ECE	Muir
Lawder, Standish D.	Associate Professor	Visual Arts	Warren
Ledden, Patrick J.	Sr. Lecturer (SOE)/Provost	Mathematics/Muir	Muir
Lee, Edward N.	Professor	Philosophy	Revelle
Lee, Sing H.	Professor	ECE	Muir
Leffert, Hyam L.	Professor	Pharmacology	SchMed
Lehmann, Bruce N.	Professor	IRPS	IRPS
Lettau, Reinhard	Professor Emeritus	Literature	Revelle
Levergood, Barbara J.	Assistant Professor	Linguistics	Warren
Levin, Andrew	Assistant Professor	Economics	Muir
Levin, Lisa	Associate Professor	SIO	SIO
Levine, Herbert B.	Professor	Physics	Third
Levine, Michael	Professor	Biology	Warren
Levy, Robert I.	Professor Emeritus	Anthropology	Muir
Levy, Thomas E.	Assistant Professor	Anthropology	Revelle
Lewak, George J.	Associate Professor Emeritus	ECE	Muir
Lewin, Ralph A.	Professor Emeritus	SIO	SIO
Lewis, George	Assistant Professor	Music	Third
Libby, Paul A.	Professor Emeritus	AMES	Revelle
Liebermann, Leonard N.	Professor Emeritus	Physics	Revelle
Lijphart, Arend	Professor	Political Science	Revelle
Lin, James P.	Professor	Mathematics	Muir
Lin, Shao-Chi	Professor Emeritus	AMES	Revelle
Lin, Ting-Ting Y.	Assistant Professor	ECE	Muir
Lindenberg, Katja	Professor	Chemistry	Third
Lindsley, Dan L.	Professor Emeritus	Biology	Revelle/SchMed
Lipsitz, George	Professor	Ethnic Studies	Third
Liu, John H. K.	Associate Professor-in-Res	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	Third
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	Third
Lyon, James K.	Professor/Provost	Literature/Fifth	Fifth
Lytle, Cecil W.	Professor/Provost	Music/Third	Third
MacConnel, Kim R.	Professor	Visual Arts	Third
MacDonald, Gordon	Professor	IRPS	IRPS
Macdougall, J. Douglas	Professor	SIO	Revelle/SIO
Machina, Mark J.	Professor	Economics	Revelle
MacLeod, Carol L.	Associate Professor-in-Res	Medicine	SchMed
MacLeod, Donald I.A.	Professor	Psychology	Muir
Madsen, Richard P.	Professor	Sociology	Fifth
Magagna, Victor V.	Associate Professor	Political Science	Muir
Magde, Douglas	Professor	Chemistry	Warren
Malhotra, Vivek	Assistant Professor	Biology	Revelle

Manaster, Alfred B.	Professor	Mathematics	Revelle
Mandell, Arnold J.	Professor Emeritus	Psychiatry	SchMed
Mandler, George	Professor	Psychology	Muir
Mandler, Jean M.	Professor	Cognitive Science	Revelle
Mangolte, Babette M.	Associate Professor	Visual Arts	Third
Manohar, Aneesh V.	Professor	Physics	Third
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-Res	Medicine	SchMed
Marshall, Margaret C.	Lecturer (SOE)	Theatre	Third
Marti, Kurt	Professor	Chemistry	Revelle
Martin, Lisa L.	Assistant Professor	Political Science	Fifth
Marzullo, Keith	Associate Professor	CSE	Third
Masek, George E.	Professor Emeritus	Physics	Revelle
Masliah, Eliezer	Assistant Professor-in-Res	Neurosciences/Pathology	SchMed
Masouredis, Serafeim P.	Professor Emeritus	Pathology	SchMed
Masry, Elias	Professor	ECE	Muir
Masters, T. Guy	Professor	SIO	SIO
Mathieu-Costello, Odile	Associate Professor-in-Res	Medicine	SchMed
McCubbins, Mathew D.	Professor	Political Science	Third
McCulloch, Andrew D.	Assistant Professor	AMES	Muir
McCurry, Stephanie	Associate Professor	History	Warren
McDaniel, Timothy L.	Professor	Sociology	Fifth
McElroy, William D.	Professor Emeritus	Biology	Revelle
McGowan, John A.	Professor	SIO	SIO
McIlwain, Carl E.	Professor Emeritus	Physics	Revelle
McKittrick, Joanna M.	Assistant Professor	AMES	Warren
McMillan, R. John	Professor	IRPS	IRPS/Fifth
McMorris, Trevor C.	Professor	Chemistry	Third
Meeker, Michael E.	Professor	Anthropology	Revelle
Mehan, Hugh B., Jr.	Professor	Sociology	Third
Melville, Wallace K.	Professor	SIO	SIO
Mendis, D. Asoka	Professor	ECE	Muir
Meranze, Michael	Assistant Professor	History	Third
Metzger, Thomas A.	Professor Emeritus	History	Muir
Meyers, Marc A.	Professor	AMES	Revelle
Middleman, Stanley	Professor	AMES	Warren
Miles, John W.	Professor Emeritus	AMES	Warren
Miller, Arnold L.	Professor	Neurosciences	SchMed
Miller, David R.	Professor	AMES	Revelle
Miller, Jeffrey O.	Professor	Psychology	Revelle
Miller, Stanley L.	Professor	Chemistry	Revelle
Mills, Stanley E.	Professor Emeritus	Biology	Muir
Milstein, Laurence B.	Professor	ECE	Warren
Minster, Jean-Bernard	Professor	SIO	SIO
Mitchell, Allan	Professor	History	Fifth
Mitchell, Sandra D.	Assistant Professor	Philosophy	Revelle
Miyai, Katsumi	Professor	Pathology/Medicine	SchMed
Miyoshi, Masao	Professor	Literature	Third
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.	Assistant Professor	Anthropology	Warren

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Moore, John C.	Assistant Professor	Linguistics	Revelle
Moore, Stanley W.	Professor Emeritus	Philosophy	Revelle
Mosshammer, Aiden A.	Professor	History	Revelle
Movellan, Javier R.	Assistant Professor	Cognitive Science	Warren
Mukerji, Chandra	Professor	Sociology/Communication	Third
Mullin, Michael M.	Professor	SIO	SIO
Munk, Walter H.	Professor Emeritus	SIO	SIO/Warren
Murakami, Hidenori	Professor	AMES	Revelle
Murre, Cornelius	Assistant Professor	Biology	Revelle
Myers, Robert R.	Professor-in-Residence	Anesthesiology/Pathology	SchMed
Nachbar, William	Professor Emeritus	AMES	Revelle
Naughton, Barry	Associate Professor	IRPS	IRPS
Nee, Thomas B.	Professor Emeritus	Music	Warren
Négyesy, János	Professor	Music	Muir
Nelson, Ann E.	Associate Professor	Physics	Muir
Nemat-Nasser, Siavouche	Professor	AMES	Revelle
Nesbitt, Muriel N.	Associate Professor	Biology	SchMed/Warren
Neville, Helen	Professor	Cognitive Science	Warren
Newman, William A.	Professor	SIO	SIO
Newmark, Leonard D.	Professor Emeritus	Linguistics	Revelle
Newport, John W.	Professor	Biology	Muir
Nicolaou, Kyriacos C.	Professor	Chemistry	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
Norman, Donald A.	Professor Emeritus	Cognitive Science	Revelle
Northcutt, R. Glenn	Professor	Neurosciences	SchMed
O'Brien, John S.	Professor	Neurosciences	SchMed
O'Brien, William A.	Assistant Professor	Literature	Muir
O'Connor, Daniel T.	Professor-in-Residence	Medicine	SchMed
O'Connor, Joseph M.	Associate Professor	Chemistry	Third
Oesterreicher, Hans K.	Professor	Chemistry	Muir
Ogdon, Wilbur L.	Professor Emeritus	Music	Muir
Ohman, Mark D.	Assistant Professor	SIO	SIO
Okamura, Melvin Y.	Professor	Physics	Revelle
Olafson, Frederick A.	Professor Emeritus	Philosophy	Revelle
Olefsky, Jerrold M.	Professor	Medicine	SchMed
Olfe, Daniel B.	Professor	AMES	Revelle
O'Neil, Thomas M.	Professor	Physics	Warren
Ong, Maria E.	Assistant Professor	Mathematics	Fifth
Onuchic, José N.	Associate Professor	Physics	Muir
O'Quigley, John	Professor	Mathematics	Muir/SchMed
Orailoglu, Alex	Assistant Professor	CSE	Revelle
Orcutt, John A.	Professor	SIO	SIO
Orloff, Marshall J.	Professor	Surgery	SchMed/Muir
Osman, Allen	Assistant Professor	Psychology	Warren
Paar, Hans	Acting Professor	Physics	Revelle
Padden, Carol A.	Associate Professor	Communication	Third
Palenik, Brian	Assistant Professor	SIO	SIO
Pandol, Stephen J.	Professor-in-Residence	Medicine	SchMed
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	Third

Parrish, Michael E.	Professor	History	Muir
Parry, Christopher N.	Associate Professor	Theatre	Fifth
Pashler, Harold E.	Associate Professor	Psychology	Muir
Pasler, Jann C.	Associate Professor	Music	Fifth
Pasquale, Joseph	Assistant Professor	CSE	Third
Patterson, Patricia A.	Professor	Visual Arts	Muir
Paturi, Ramamohan	Assistant Professor	CSE	Warren
Pearce, Roy Harvey	Professor Emeritus	Literature	Fifth
Penn, Nolan E.	Professor	Psychiatry	SchMed
Penner, Stanford S.	Professor Emeritus	AMES	Revelle
Pereira, Alfredo M.	Assistant Professor	Economics	Warren
Perlmutter, David M.	Professor	Linguistics	Revelle
Perrin, Charles L.	Professor	Chemistry	Revelle
Peterson, Laurence E.	Professor	Physics	Revelle
Peterson, Melvin N. A.	Assoc. Prof. Emeritus	SIO	SIO
Phillips, David P.	Professor	Sociology	Revelle
Phipps-Morgan, W. Jason	Associate Professor	SIO	SIO
Phleger, Fred B.	Professor Emeritus	SIO	SIO
Piccioni, Oreste	Professor Emeritus	Physics	Revelle
Pickowicz, Paul G.	Professor	History	Muir
Pineda, Jaime A.	Assistant Professor	Cognitive Science	Fifth
Pinkel, Robert	Professor	SIO	SIO
Pinon, Ramon, Jr.	Associate Professor	Biology	Third
Pippin, Robert B.	Professor	Philosophy	Revelle
Plantamura, Carol	Professor	Music	Revelle
Polyzos, George C.	Assistant Professor	CSE	Fifth
Pomeroy, Earl	Professor Emeritus	History	Warren
Poole, Fitz John P.	Associate Professor	Anthropology	Muir
Popkin, Samuel L.	Professor	Political Science	Third
Posakony, James W.	Associate Professor	Biology	Third
Powell, Frank L.	Associate Professor	Medicine	SchMed
Powell, Henry C.	Professor	Pathology	SchMed
Pozrikidis, Constantine	Associate 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.	Associate Professor	ECE	Warren
Rabin, Jeffrey M.	Associate Professor	Mathematics	Revelle
Radcliff, Pamela B.	Assistant Professor	History	Fifth
Rafael, Vicente L.	Associate Professor	Communication	Third
Raitt, Russell W.	Professor Emeritus	SIO	SIO
Ramachandran, Vilayanur S.	Professor	Psychology	Third
Ramanathan, Ramachandra	Professor	Economics	Revelle
Ramanathan, Veerabhadran	Professor	SIO	SIO
Ramey, Garey	Assistant Professor	Economics	Warren
Ramey, Valerie A.	Assistant Professor	Economics	Third
Rand, Sinai	Associate Professor Emeritus	AMES	Revelle
Randel, Fred V.	Associate Professor	Literature	Revelle
Rangan, Venkat P.	Assistant Professor	CSE	Revelle
Rao, Bhaskar D.	Associate Professor	ECE	Revelle
Rao, Ramesh	Associate Professor	ECE	Revelle
Rapaport, Samuel I.	Professor Emeritus	Medicine/Pathology	SchMed
Rasmussen, Dennis D.	Associate Professor-in-Res	Reproductive Medicine	SchMed

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Rauch, James E.	Associate Professor	Economics	Third
Raut, Lakshmi K.	Assistant Professor	Economics	Warren
Rearden, C. Anne	Professor	Pathology	SchMed
Reid, Joseph L.	Professor Emeritus	SIO	SIO
Reid, Roddey	Assistant Professor	Literature	Muir
Reissner, M. Erich	Professor Emeritus	AMES/Mathematics	Revelle
Rommel, Jeffrey D.	Professor	Mathematics	Muir
Renn, Scot R.	Assistant Professor	Physics	Revelle
Reynolds, Edward	Professor	History	Third
Reynolds, Roger L.	Professor	Music	Muir
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	Third
Rincon, Patricia A.	Lecturer (SOE)	Theatre	Fifth
Ringgold, Faith	Professor	Visual Arts	Muir
Ringrose, David R.	Professor	History	Revelle
Rinott, Yosef	Professor	Mathematics	Revelle
Rodin, Burton	Professor	Mathematics	Muir
Roeder, Philip G.	Assistant Professor	Political Science	Third
Roemmich, Dean H.	Associate Professor	SIO	SIO
Rohrl, Helmut	Professor	Mathematics	Revelle
Roise, David	Assistant Professor	Chemistry	Warren
Rona-Tas, Akos	Assistant Professor	Sociology	Fifth
Rosenblatt, Murray	Professor	Mathematics	Muir
Rosenblatt, Richard H.	Professor	SIO	SIO
Rosenbluth, Frances M.	Assistant Professor	IRPS	IRPS
Rosenbluth, Marshall N.	Professor	Physics	Fifth
Rosenfeld, Michael G.	Professor	Medicine	SchMed
Ross, Lola R.	Professor	Comm & Fam Medicine	SchMed/Muir
Rotenberg, Manuel	Professor Emeritus	ECE	Muir
Rothenberg, Jerome D.	Professor	Visual Arts/Literature ⁹	Fifth
Rothschild, Linda P.	Professor	Mathematics	Warren
Rothschild, Michael	Professor/Dean	Economics/Social Sciences	Third
Rudee, M. Lea	Professor/Dean	ECE/Engineering	Warren
Rudwick, Martin J.S.	Professor	History	Warren
Ruiz, Ramon E.	Professor Emeritus	History	Muir
Rumsey, Victor H.	Professor Emeritus	ECE	Muir
Russell, Percy J.	Associate Professor Emeritus	Biology	SchMed
Sah, Robert L.-Y.	Assistant Professor	AMES	Muir
Saier, Milton H., Jr.	Professor	Biology	Muir
Sailor, Michael J.	Assistant Professor	Chemistry	Fifth
Saito, Leland	Assistant Professor	Ethnic Studies	Third
Saitoh, Tsunao	Associate Professor	Neurosciences	SchMed
Saks, Michael E.	Professor	CSE	Third
Salmon, David P.	Assistant Professor-in-Res	Neurosciences	SchMed
Salmon, Richard L.	Professor	SIO	SIO
Saltman, Paul D.	Professor	Biology	Revelle
Sanchez, Marta E.	Associate Professor	Literature	Third
Sanchez, Rosaura	Associate Professor	Literature	Third
Sandwell, David T.	Associate Professor	SIO	SIO
Santos, Adele N.	Professor/Dean	Architecture/SchArch	SchArch
Sarkar, Sutanu	Assistant Professor	AMES	Warren
Saville, Jonathan	Associate Professor	Theatre	Revelle
Saville, Julie	Associate Professor	History	Third
Savitch, Walter J.	Professor	CSE	Muir

Scanga, Italo	Professor	Visual Arts	Muir
Schane, Sanford A.	Professor	Linguistics	Fifth
Scheffler, Immo E.	Professor	Biology	Revelle
Schick, Steven E.	Associate Professor	Music	Muir
Schiller, Daniel T.	Associate Professor	Communication	Muir
Schiller, Herbert I.	Professor Emeritus	Communication	Third
Schmid-Schoenbein, Geert W.	Professor	AMES	SchMed
Schmidt, Robert J.	Assistant Professor	Biology	Warren
Schneider, Alan M.	Professor Emeritus	AMES	Warren
Schneider, Jerry A.	Professor	Pediatrics	SchMed
Schrauzer, Gerhard N.	Professor	Chemistry	Revelle
Schreibman, Laura E.	Professor	Psychology	Warren
Schroeder, Julian I.	Assistant Professor	Biology	Warren
Schuckit, Marc A.	Professor	Psychiatry	SchMed
Schudson, Michael S.	Professor	Sociology/Communication	Third
Schuller, Ivan K.	Professor	Physics	Revelle
Schultz, Sheldon	Professor	Physics	Third
Schwartz, Theodore	Professor	Anthropology	Muir
Sclater, John G.	Professor	SIO	SIO
Scull, Andrew	Professor	Sociology	Fifth
Sebald, Anthony V.	Associate Professor	ECE	Third
Segal, David S.	Professor	Psychiatry	SchMed
Seible, Frieder	Professor	AMES	Third
Sejnowski, Terrence J.	Professor	Biology	Muir
Selverston, Allen I.	Professor	Biology	Warren
Sereno, Martin I.	Assistant Professor	Cognitive Science	Warren
Seshadri, Kalyanasundaram	Professor	AMES	Third
Shadwick, Robert E.	Associate Professor	SIO	SIO
Shafir, Gershon	Associate Professor	Sociology	Fifth
Shaiken, Harley	Associate Professor	Communication	Revelle
Sham, Lu Jeu	Professor	Physics	Warren
Shank, Adele E.	Professor Emeritus	Theatre	Third
Shank, Theodore J.	Professor	Theatre	Revelle
Shapin, Steven	Professor	Sociology	Revelle
Sharpe, Michael J.	Professor	Mathematics	Muir
Shearer, Peter M.	Associate Professor	SIO	SIO
Shenk, Norman A.	Associate Professor	Mathematics	Revelle
Sher, Gila	Assistant Professor	Philosophy	Warren
Shevelow, Kathryn	Associate Professor	Literature	Muir
Shirk, Susan L.	Professor	Political Science/IRPS	Fifth/IRPS
Shor, George G., Jr.	Professor Emeritus	SIO	SIO
Shugart, Matthew F.	Assistant Professor	IRPS	IRPS
Shuler, Kurt E.	Professor Emeritus	Chemistry	Revelle
Shults, Clifford W.	Associate Professor	Neurosciences	SchMed
Siegel, Jay S.	Associate Professor	Chemistry	Muir
Silber, John J.	Professor Emeritus	Music	Fifth
Silva, Ernest R.	Associate Professor	Visual Arts	Warren
Simon, John D.	Professor	Chemistry	Muir
Singer, S. Jonathan	University Professor	Biology	Revelle/SchMed
Sinha, Amitabha	Assistant Professor	Chemistry	Muir
Skalak, Richard	Professor-in-Residence	AMES	SchMed
Small, Lance W.	Professor	Mathematics	Revelle
Smallwood, Dennis E.	Associate Professor	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	Third

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Smith, Susan L.	Assistant Professor	Visual Arts	Third
Snyder, Jon R.	Associate Professor	Literature	Fifth
Sobel, Joel	Professor	Economics	Revelle
Solis, Faustina	Professor Emeritus	Comm & Fam Med	Third
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	Third
Spector, Deborah H.	Professor	Biology	SchMed/Fifth
Spiess, Fred N.	Professor Emeritus	SIO	SIO
Spiro, Melford E.	Professor Emeritus	Anthropology	Muir
Spitzer, Nicholas C.	Professor	Biology	Muir
Spivack, Arthur J.	Assistant Professor	SIO	SIO
Spooner, Charles E.	Professor Emeritus	Neurosciences	SchMed
Squire, Larry R.	Professor-in-Residence	Psychiatry	SchMed
Stanton-Salazar, Ricardo D.	Assistant Professor	Sociology	Muir
Stark, Harold M.	Professor	Mathematics	Muir
Starr, Ross M	Professor	Economics	Warren
Steiger, Rand	Associate Professor	Music	Warren
Steinberg, Daniel	Professor	Medicine	SchMed
Steinmetz, Phel	Associate Professor	Visual Arts	Revelle
Stern, Herbert	Professor Emeritus	Biology	Third
Stevens, Jane	Assistant Professor	Music	Warren
Stewart, John L.	Professor Emeritus	Literature	Muir
Stiles, Joan	Associate Professor	Psychology	Muir
Stinchcombe, Maxwell B.	Associate Professor	Economics	Third
St. John, Mark F.	Assistant Professor	Cognitive Science	Third
Storms, Lowell H.	Professor-in-Residence	Psychiatry	SchMed
Stroll, Avrum	Professor Emeritus	Philosophy	Revelle
Strom, Kaare	Associate Professor	Political Science	Fifth
Strong, Tracy B.	Professor	Political Science	Fifth
Strum, Shirley C.	Professor	Anthropology	Revelle
Suarez-Orozco, Marcelo	Associate Professor	Anthropology	Third
Subramani, Suresh	Professor	Biology	Warren
Suess, Hans E.	Professor Emeritus	Chemistry	Revelle/SIO
Sueyoshi, Glenn T.	Assistant Professor	Economics	Revelle
Sugihara, George	Associate Professor	SIO	SIO
Suhl, Harry	Professor Emeritus	Physics	Revelle
Surko, Clifford M.	Professor	Physics	Third
Swain, Susan L.	Professor-in-Residence	Biology	Revelle
Swanson, Robert A.	Professor Emeritus	Physics	Revelle
Swartz, Marc J.	Professor	Anthropology	Muir
Swinney, David A.	Professor	Psychology	Fifth
Sworder, David D.	Professor	ECE	Revelle
Takash, Paule Cruz	Assistant Professor	Ethnic Studies	Third
Talbot, Jan B.	Associate Professor	AMES	Muir
Talke, Frank E.	Professor	AMES	Warren
Talley, Lynne D.	Professor	SIO	SIO
Tauxe, Lisa	Associate Professor	SIO	SIO
Tay, William Shu-sam	Professor	Literature	Fifth
Taylor, Palmer W.	Professor	Pharmacology	SchMed
Taylor, Susan S.	Professor	Chemistry	SchMed/Fifth
Teilhet-Fisk, Jehanne H.	Professor	Visual Arts	Muir
Terras, Audrey A.	Professor	Mathematics	Revelle
Terry, Robert D.	Professor	Neurosciences/Pathology	SchMed

Thal, Leon J.	Professor	Neurosciences	SchMed
Thiemens, Mark H.	Professor	Chemistry	Third
Thiess, Frank B.	Sr. Lecturer (SOE) Emeritus	Mathematics	Third
Thompson, William B.	Professor Emeritus	Physics	Revelle
Ticho, Harold K.	Professor Emeritus	Physics	Third
Tilley, T. Don	Professor	Chemistry	Third
Tohsaku, Yasu-Hiko	Associate Professor	IRPS	IRPS/Fifth
Tokuyasu, Kiyoteru	Professor-in-Res Emeritus	Biology	Revelle
Tomlinson, Barbara	Associate Professor	Literature	Muir
Trauner, Doris A.	Professor	Neurosciences/Pediatrics	SchMed
Traylor, Teddy G.	Professor Emeritus	Chemistry	Revelle
Trogler, William C.	Professor	Chemistry	Revelle
Troupe, Quincy	Professor	Literature	Third
Truant, Cynthia M.	Associate Professor	History	Fifth
Tschirgi, Robert D.	Professor Emeritus	Neurosciences	SchMed/Muir
Tsien, Roger K.	Professor	Pharmacology/Chemistry	SchMed/Revelle
Tu, Charles W.	Professor	ECE	Fifth
Tukey, Robert H.	Associate Professor-in-Res	Medicine/Pharmacology	SchMed
Turetzky, Bertram J.	Professor	Music	Muir
Turner, Christena	Assistant Professor	Sociology	Fifth
Tuzin, Donald F.	Professor	Anthropology	Revelle
Tyler, David R.	Acting Associate Professor	Physics	Muir
Ubbelomde, M. Susan	Associate Professor	Architecture	SchArch
Uht, Augustus K.	Assistant Professor	CSE	Revelle
Vacquier, Victor	Professor Emeritus	SIO	SIO
Vacquier, Victor D.	Professor	SIO	SIO
VanAtta, Charles W.	Professor	AMES/SIO	Revelle/SIO
Van Young, Eric	Professor	History	Fifth
Varki, Ajit P.	Professor	Medicine	SchMed
Varni, James W.	Professor-in-Residence	Psychiatry	SchMed
Varon, Silvio S.	Professor	Biology	SchMed
Vasquez, Olga	Assistant Professor	Communication	Third
Vecchio, Kenneth S.	Assistant Professor	AMES	Fifth
Vehrencamp, Sandra L.	Professor	Biology	Muir
Vendler, Zeno	Professor Emeritus	Philosophy	Muir
Verdicchio, Pasquale	Assistant Professor	Literature	Fifth
Vernon, Wayne	Professor	Physics	Revelle
Vianu, Victor D.	Associate Professor	CSE	Third
Viturbi, Andrew J.	Professor	ECE	Warren
Volcani, Benjamin E.	Professor Emeritus	SIO	SIO
Vold, Regitze R.	Professor	Chemistry	Revelle
Von Lates, Adrienne	Assistant Professor	Visual Arts	Muir
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	Third
Walk, Cynthia	Associate Professor	Literature	Fifth
Wallach, Nolan R.	Professor	Mathematics	Fifth
Walter, Gernot F.	Professor	Pathology	SchMed
Wang, Jean Yin Jen	Associate Professor	Biology	SchMed/Fifth
Ward, John F.	Professor	Radiology	SchMed
Wasserman, Stephen I.	Professor	Medicine	SchMed
Watson, Joseph W.	Professor/Vice Chancellor	Chemistry/Student Affairs	Third

UCSD FACULTY MEMBERS

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	Revelle
Webster, Nicholas J. G.	Assistant Professor-in-Res	Medicine	SchMed
Wei, Wuchang	Assistant Professor	SIO	SIO
Weinger, Matthew B.	Assistant Professor	Anesthesiology	SchMed
Weiss, Ray F.	Professor	SIO	SIO
Welchman, John C.	Assistant Professor	Visual Arts	Muir
Wenkert, Ernest	Professor	Chemistry	Revelle
Wenzl, Hans	Associate Professor	Mathematics	Third
Werner, Bradley T.	Assistant Professor	SIO	SIO
Wesling, Donald T.	Professor	Literature	Fifth
West, John B.	Professor	Medicine	SchMed
Westman, Robert S.	Professor	History	Muir
Wheeler, John C.	Professor	Chemistry	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-Res Emeritus	ECE	Muir
Wiederholt, Wigbert C.	Professor	Neurosciences	SchMed
Wiley, Clayton A.	Associate Professor	Pathology/Neurosciences	SchMed
Williams, Ben A.	Professor	Psychology	Muir
Williams, Forman A.	Professor	AMES	Third
Williams, Ruth J.	Professor	Mathematics	Warren
Williams, Sherley A.	Professor	Literature	Third
Williamson, S. Gill	Professor	CSE	Fifth
Wills, Christopher	Professor	Biology	Warren/SchMed
Wilson, Kent R.	Professor	Chemistry	Revelle
Winant, Clinton D.	Professor	SIO	SIO
Winker, James R.	Associate Professor	Theatre	Third
Winterer, Edward L.	Professor	SIO	SIO
Wiseman, Jacqueline P.	Professor Emeritus	Sociology	Warren
Wixted, John T.	Assistant Professor	Psychology	Revelle
Wolf, Jack K.	Professor	ECE	Fifth
Wolfe, Arthur M.	Professor	Physics	Warren
Woll, S. Heather	Assistant Professor	CSE	Fifth
Wong, David Y.	Professor/Provost	Physics/Warren	Warren
Wong-Staal, Flossie	Professor	Biology/Medicine	Revelle/SchMed
Woodhull, Winifred	Assistant Professor	Literature	Warren
Woodruff, David S.	Professor	Biology	Fifth
Woolard, Kathryn A.	Associate Professor	Sociology	Muir
Wright, Andrew	Professor Emeritus	Literature	Revelle
Wulbert, Daniel E.	Professor	Mathematics	Third
Xuong Nguyen-Huu	Professor	Biology/Chemistry/Physics	Revelle/SchMed
Yaffe, Michael P.	Associate Professor	Biology	Third
Yaksh, Tony L.	Professor	Anesthesiology	SchMed
Yalowitz, Steven	Assistant Professor	Philosophy	Fifth
Yanofsky, Martin F.	Assistant Professor	Biology	Warren
Yen, Samuel S.C.	Professor	Reproductive Medicine	SchMed
Yguerabide, Juan	Professor	Biology	Third
Yip, Wai-Lim	Professor	Literature	Muir
Yoneyama, Lisa	Assistant Professor	Literature	Fifth
York, Herbert F.	Professor Emeritus	Physics	Warren
Young, William R.	Professor	SIO	SIO

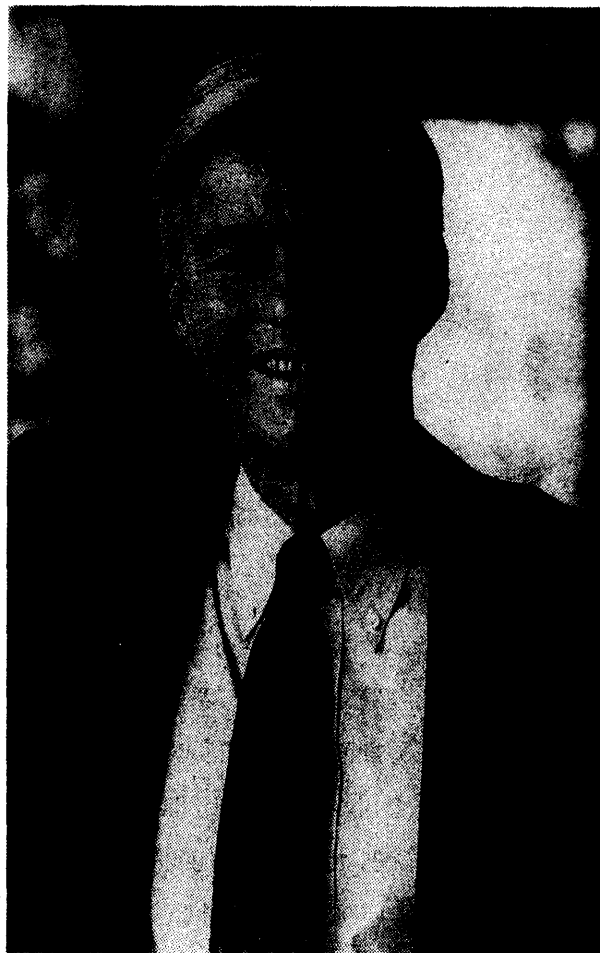
UCSD FACULTY MEMBERS

<p>.....</p> <p>Yu, Edward Yu, Paul K. L. Yuasa, Joji</p>	<p>Assistant Professor Associate Professor Professor</p>	<p>ECE ECE Music</p>	<p>Third Revelle Warren</p>
<p>Zamosc, Leon Zanetti, Maurizio Zhiri, Oumelbanine Zimm, Bruno H. Zipser, David Zisook, Sidney Zivin, Justin A. Zola-Morgan, Stuart M. Zuker, Charles Zweifach, Benjamin W.</p>	<p>Associate Professor Associate Professor-in-Res Assistant Professor Professor Emeritus Professor Professor Professor Associate Professor-in-Res Associate Professor Professor Emeritus</p>	<p>Sociology Medicine Literature Chemistry Cognitive Science Psychiatry Neurosciences Psychiatry Biology/Neurosciences AMES</p>	<p>Warren SchMed Fifth Revelle Fifth SchMed SchMed SchMed Revelle Warren/SchMed</p>





INTERVIEWS



UCSD is among the top universities in the country, a fact supported by its membership in the highly selective Association of American Universities (other California Universities in the AAU are UC Berkeley, UCLA, USC, Stanford, and Caltech). Central to UCSD's national prominence is the excellence of its faculty. By every measure, UCSD faculty rate among the very best; UCSD is among the top ten universities in the nation in the number of faculty who are members of the National Academy of Sciences; a substantial number of faculty are also elected to the American Academy of Arts and Sciences, the National Academy of Engineering, the Institute of Medicine, and the American Philosophical Society.

Another important measure of the quality of a university is the quality of its student body. Over 18,000 undergraduate and graduate students pursue degrees in a variety of academic programs at UCSD. UCSD is first among public universities in the percentage of undergraduates accepted into medical school and doctoral programs. UCSD is also exceptional in that it embodies the cluster college concept; each student and faculty member belongs to one of the five colleges with each college having its own general-education requirements. This college structure provides a stimulating environment of social and academic interaction rarely found at large research university campuses.

The distinguished faculty, the excellent academic programs, and high quality of the student body, together with the splendid physical setting of the campus, offer an incomparable university experience. The following interviews provide interesting insights by faculty, staff, and students at UCSD.

Richard C. Atkinson
Chancellor, UCSD

MARIA ELIZABETH ONG
ASSISTANT PROFESSOR OF MATHEMATICS



Maria Elizabeth (Beth) Ong joined the Department of Mathematics at UCSD in July 1992. She was born in Manila, Philippines and is one of nine children. She attended the University of Santo Tomas in Manila, where she graduated summa cum laude with a bachelor's degree in mathematics (with emphasis in actuarial science).

After working for three years as a programmer for the Philippine American Life Insurance Company, Ong came to the United States to pursue a doctoral degree. She attended the University of Washington in Seattle and, in 1989, earned her Ph.D. in applied mathematics, specializing in numerical analysis. Her thesis, "Hierarchical Basis Preconditioners for Second Order Elliptic Problems in Three Dimensions," was co-awarded the prestigious Householder Prize for the best dissertation in numerical analysis.

Subsequently, she went to UCLA, where she was a computational applied mathematics research assistant professor for three years. Since coming to UCSD, Ong's research has centered on numerical analysis and scientific computation.

Q. You joined the Department of Mathematics last July. How do you like UCSD?

A. It's a beautiful campus; I like the landscape and the ocean nearby. The atmosphere is quiet and relaxed, which I like. The people are friendly and supportive. The faculty members and graduate students whom I have met—most are in numerical analysis—excel in their fields.

Q. What led you to choose a career in mathematics?

A. The high school evaluation examination we took in high school showed that I was good in mathematics, chemistry, and physics. Many of my teachers encouraged me to major in mathematics with emphasis in actuarial science because it was in demand and paid well. So, academic interest and economic reasons played a big role in my career choice. I also considered medicine at the time, but two of my sisters who are in the medical field discouraged me.

Q. How did you become interested in computation?

A. After much encouragement from my sister in the U.S., I applied for graduate studies in computer science at five U.S. universities, and in applied mathematics at the University of Washington. Most of the five universities accepted me under the condition that I fulfill some undergraduate computer science requirements, and only the University of Washington accepted me unconditionally. It even offered me a research assistantship. Since I could not afford graduate school without financial support, the choice was clear.

Q. Does your research in computation enhance your class?

A. Very much so. One way to see the usefulness of mathematics, as well as to motivate its study, is to survey various engineering applications (e.g., airplane flight, climate modeling, human genome, composite materials) which are being researched in academia, national laboratories, and private industry. Students don't want to see just numbers and equations; they want to see where those numbers and equations get applied. In their everyday life, the applications they see are often limited to interest rates in their bank accounts, credit accounts, and loans. To better appreciate the more complex applications of mathematics, one has to pursue advanced studies in applied

I deal with my colleagues as a scientist, not as a woman.

mathematics and be exposed to more intricate and interesting problems.

Q. What are some of the challenges that you face in your profession and in your research?

A. If you are in the academic field, you are faced with two main challenges. One challenge is teaching. It takes a lot of ingenuity to get students interested in mathematics. I think most students find mathematics dry and irrelevant. Linking mathematics to what the students see in their everyday life captures their interest. For example, when I talk about a function and its graph, I talk about the function that describes the trajectory of a Patriot missile. When I talk about roundoff error, I discuss the error incurred in the computer that caused the erroneous prediction of the location of the scud missile that hit a barracks in Saudi Arabia. Such examples make mathematics seem more relevant. The other main challenge is research. It requires a tremendous amount of creativity, resourcefulness, hard work, and perseverance. It also may involve collaboration with other people. The amount of time spent on a project can be as little as days and as much as years.

Q. What are the best career possibilities that today's math. major can look forward to and what are the best educational routes toward them?

A. If you have an undergraduate degree in either applied or pure mathematics, your career opportunities would include mathematical research and programming. Many national laboratories and private companies that deal with mathematical applications hire math majors for their ability to

think logically, do scientific computing, and solve mathematical problems. You also can work for financial and insurance companies, where you will assess risks and investments, or for companies that perform statistical studies. Of course, you also can teach, but with an undergraduate degree, your teaching options are limited. With a doctoral degree, the opportunities are much greater. You can teach at universities and perform your own research in academia or at research institutions. You can work or consult for national laboratories and private companies on mathematical models and methods for a wide class of applications, including aerospace, signal and image processing, medicine, chemistry, biology, and oceanography.

Q. How do you feel women are treated in mathematics-related careers? Is it a difficult field for them to work in?

A. My experience, so far, has been wonderful. I have always been treated as a colleague. I think a lot has to do with the person herself. I deal with my colleagues as a scientist, not as a woman. Most of the successful people in my field have worked hard—regardless of gender. I think this country is extremely generous and gives every person a lot of opportunities. You just have to take advantage of them and work hard.

DAVID SANDWELL

ASSOCIATE PROFESSOR, SCRIPPS INSTITUTION OF OCEANOGRAPHY

Upon arriving in Tahiti, after twenty-three days at sea on a research ship, the first thing Associate Professor David Sandwell did was wax his board and check out the surf. Unlike his usual surfing spot at Black's, just a half mile up the beach from his offices and lab at UCSD's Scripps Institution of Oceanography, Tahiti sports an outside reef break. Surfing has been a part of Sandwell's life since as a teenager in the late 1960s he shaped boards in the basement of his West Hartford, Connecticut, home to ride the cold eastern seaboard winter waves. No doubt the sport has helped shape the scientist as well.

Sandwell first came to UCSD when he was a graduate student at UCLA, in an arrangement within the multicampus Institute of Geophysics and Planetary Physics that allowed him to spend most of his time at Scripps. After obtaining a Ph.D. in geophysics and space physics he became a scientist with the National Geodetic Survey. His interest, however, was academic research, particularly in the experimental use of earth-orbiting satellites to observe ocean features. In 1985, he accepted an appointment as a research scientist with the University of Texas at Austin and, in 1989, he joined the faculty



at Scripps. In addition to research and teaching within Scripps's Geological Research Division, Sandwell is an associate editor of two scientific journals and serves as an adviser to NASA and the National Science Foundation on marine geophysical initiatives. His expertise is in applying sophisticated remote sensing data collected by satellites and ships to mapping the seafloor and charting unexplored areas of the world's oceans. He is married and has three young children.

Although much of his work is done on a computer with data collected from space, Sandwell goes on oceanographic expeditions about every other year. Data from these and other cruises provide "ground truth," which allows scientists to confirm and refine what the satellites measure. In January 1993, he was chief scientist on a geophysical survey, mapping uncharted areas of the southern Pacific near Tahiti and Easter islands, where satellite data revealed evidence of unusual seafloor features.

Q. How did you become interested in science?

A. My father had a complete metal and wood shop in the basement, so in the winter my brother and I would spend much of our free time building such things as model planes, surfboards, minibikes, go-carts, and boats. All of this drove my mother crazy because we were always popping fuses or creating toxic fumes that would percolate up through the rest of the house. In school, I seemed to have a natural talent for math., and I became interested in physics because of a high school teacher, Mr. Hoyt. He was an eccentric man who, rather than strictly teach physics out of a textbook, used his own notes relating physics to such things as calculating the deceleration that occurs when a car hits a bridge piling.

In college I did well in physics and math., but I wasn't interested in many of the theoretical aspects of quantum mechanics and particle physics or attracted to the engineering side. I enjoyed and understood classical physics, that is, mechanics, electromagnetism, and optics. As a result, I found geophysics a good option. Scripps helped me realize I could apply this interest to the oceans.

Q. What does a marine geophysicist do?

A. A marine geophysicist uses the tools of physics, engineering, and statistics to investigate the geological processes that create and modify the ocean floor. My area of expertise is investigating

the ocean basins using data collected by satellites orbiting the earth fourteen times a day. When they are over the ocean they measure the height of the surface using a radar altimeter. The radar pulse reflects from a spot directly beneath the satellite and detects bumps and valleys caused by the gravitational attraction of massive features on the seafloor, such as large volcanoes. By compiling many satellite altimeter profiles across an ocean area, we can construct detailed maps of the ocean surface topography. Since the ocean surface topography mimics the topography of the ocean floor we can map out large uncharted areas in a very short period of time. In the Southern Hemisphere, there are still many areas of seafloor that are completely unknown so these satellite data are providing our first overview of these areas. Research ships with multibeam sonar instruments are required to chart and investigate the features in greater detail.

Q. What are the tools you use to conduct your studies?

A. Basically, we couldn't do any of this research without computers. The remote sensing systems contain many sophisticated computers all working in harmony to generate pulses, record return signals, derive physical quantities, and record this information on tape. In addition, for both satellite and shipboard instruments we need precise geodetic information to establish their locations and orientation. These data along with environmental corrections are merged with the sensor data to form data records that can be used by a geophysicist. Most of the initial data collection and processing is done by engineers and technicians.

Our synthesis and analysis of the data also relies extensively on computers since it is impossible to look at even a small fraction of the numbers. In this type of data analysis, the main limitation is disk space and disk access time rather than the speed of the computer, so the new workstations with large disk and tape drives are ideal. We probably spend most of our time, however, locating and developing software systems to analyze the data.

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Q. How are new technologies advancing marine geophysics?

A. The field of mapmaking is a good example where there have been major impacts in the past decade. The original method of making a topographic map of the seafloor was to gather all of the depth soundings for a particular area and write the numbers down on a map called a sounding sheet. When all of the numbers were compiled, contour lines were drawn by hand. An illustrator would redraft all of the contour lines and add the map labels. Finally the map was sent out to the print shop where it was photographed and printed. After printing it was impossible to make changes and improvements so the mapmaker used only tested methods; there was little room for

experimentation with analysis and display. Today the overall objectives are exactly the same and in most ocean areas there is still a severe lack of data. However, the mechanics of making a map have changed completely. Now one gathers the data by first searching the local data base for depth soundings and then searching remote data bases at other oceanographic institutions using the computer network. In the ideal situation, one can obtain data from another site without help from a person there. The numbers are gathered into computer files where erroneous figures are removed and navigation errors are corrected. This is all done through computer algorithms following rules about how to treat the data. The analyst must design the process but does not have time to look at individual cases. Finally, the data are made into a uniform grid of numbers using an interpolation or smoothing algorithm. At this point the numbers can be used for quantitative geophysical modeling or to make colorful displays and maps.

Q. Is Scripps a good place to do your research?

A. I really like doing research and teaching at Scripps. I have worked in the federal government and the main difference between Scripps and a government lab is that at the university, people seem to be more involved in what they are doing. Students are another important aspect of the research environment at Scripps because they provide a constant flux of new ideas. It is fun to come up with a hypothesis that needs to be tested and going about the collection and analyzation of data. In reality, a lot of time must be spent writing proposals to obtain funding to do the work. I enjoy working at sea as long as the instruments operate smoothly and the weather is good.

MARTA ESTER SANCHEZ
ASSOCIATE PROFESSOR OF LITERATURE



Marta Ester Sanchez, an associate professor in the Department of Literature at the University of California, San Diego, has the singular distinction of writing the first published book-length study about Chicana literature.

In her book, *Contemporary Chicana Poetry: Critical Approaches to an Emerging Literature* (University of California Press, 1985), Sanchez focuses on the poetry of Alma Villaneuva, Lorna Dee Cervantes, Lucha Corpi and Bernice Zamora, maintaining that the many tensions that beset the Chicana poet, including gender and ethnic dilemmas, have served as stimuli for the creation of their work, thereby giving expression to their personal and literary struggles.

Sanchez accepted a fellowship at the Irvine Humanities Research Center for the fall and winter quarters of the 1992-93 academic year, where she is researching material for a second book about the interrela-

tionships among Chicano, African American, and Puerto Rican narrative literatures with respect to race, ethnicity, and the reading audience. Among the writers she is studying are Sherley Anne Williams, a professor of literature and writing at UCSD, best known for her novel *Dessa Rose*, and her award-winning children's book, *Working Cotton*; Piri Thomas, author of *Down These Mean Streets*; and Artura Islas' work, *The Rain God*.

Sanchez received her Ph.D. in comparative literature from UCSD in 1977. As a youth in Los Angeles, she attended a private, parochial high school and Mount St. Mary's College, where she received a bachelor of arts degree in 1966. She received a master's degree from John Carroll University in Cleveland, Ohio, in 1968.

Q. What do you think is one of the more important factors to consider for a student who wants to go on to college?

A. Find a mentor early on, while in junior high or high school. That person can be a teacher you respect, a guidance counselor, or a religious leader in your life. One of my mentors was a teacher, Sister Mary Prose, who took an interest in me when I was a junior in high school. She encouraged me, and recognized something in me that I could not see in myself at the time. This was a critical point in my life. It was the turning point for me because I came from a family that didn't have a tradition of going to college. The biggest obstacle for many Chicano students, still, is the reality of not having seen their own parents go to college. The Chicano community is still principally working class and, therefore, not a group with a strong tradition in higher education. Many students find themselves dropping out of high school and entering service jobs or going to vocational schools.

One can't always get a clear understanding of the world just from our own world view. We have to experience another's.

Q. If it is difficult for minority students to find the information close to home, what do you suggest they do?

A. Be persistent in the exploration of possibilities, start early, and don't be intimidated. It's common for students, especially minority students, to find themselves on a non-college-bound educational track. They don't know what their options are, or even what kind of information is available to them. For many, the typical path is going to public high school, then a community college or trade school. I encourage students to investigate the state university systems, such as the UC and state college systems in California. Aim high.

Q. Apart from having a mentor, which seems to be a recurrent theme with people who have had successful academic experiences, what else do you recommend for students who are preparing for a college career?

A. Take the right courses, naturally, including math., science, and English. For the most part, read college catalogs to see what the entrance requirements are. It's important to take all the required courses in order to be sufficiently prepared. Solid information is vital. Without it, students can fail to get into a college-bound "track." Often their families are ill-prepared to guide them, because they themselves don't know the process. Get

information from financial advisers, counselors, university catalogs, and from people who have gone to the schools you are interested in. Take tours of the campuses and talk with representatives from the various college outreach programs. Also, READ!!! Make friends with books. Some books are hard reading. Not everything comes easily, so there are sacrifices to be made. Expect to make them. Stick with it. Education is about reading and discipline, but it shouldn't stop anyone from approaching it. Develop good vocabulary-building skills and study habits.

Q. If a student is thinking, "Well, that sounds all well and good, but I want to start making some money now," what would you tell him or her?

A. To gain anything, you have to take the risk of experiencing the unknown. It might be scary right now, but the long-range benefits far outweigh any short-term disadvantages. One can't always get a clear understanding of the world just from our own world view. We have to experience another's.

Q. In what way do you mean that?

A. Well, for instance, we expect immigrants and migrants to accommodate to American values. But it's important to try to see things through their eyes, as well. Literature is a powerful tool that can teach us about who others are, and conversely who we are in their eyes. The process can be discomfoting, but challenge is part of the educational experience.

RENE CRUZ

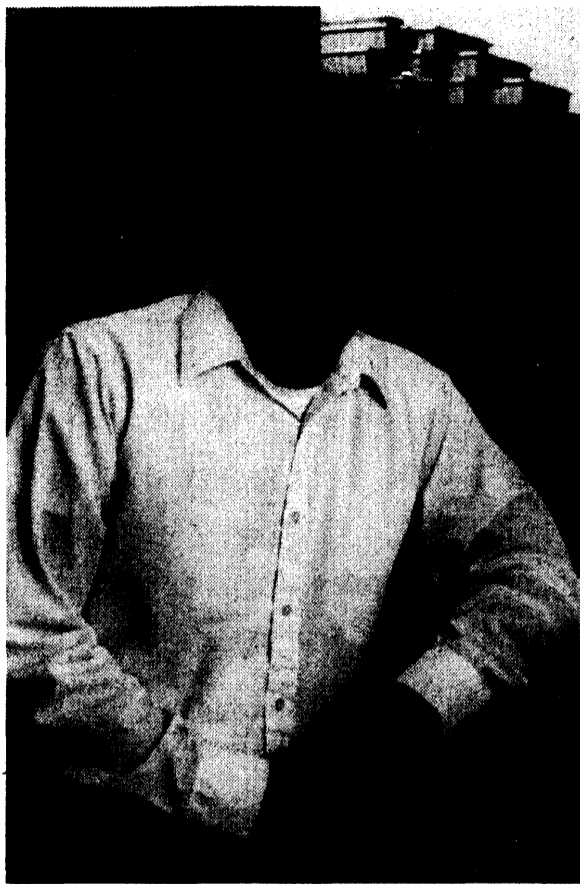
ASSISTANT PROFESSOR OF ELECTRICAL AND COMPUTER ENGINEERING

Rene Cruz, a second generation electrical engineer, grew up around the University of Illinois in Urbana, a large research university where his father was a professor. Today, the thirty-three-year-old Cruz apparently has also been attracted by a similar life and career as an assistant professor of electrical and computer engineering at UCSD.

Cruz, who joined the faculty here in 1987, completed his master's degree at M.I.T. in electrical engineering. Subsequently, he worked at Stanford Telecommunications as a communications analyst, and then enrolled at the University of Illinois in Urbana where he earned his Ph.D., again in electrical engineering.

During his tenure at UCSD, Cruz has been focusing his research interests on finding better ways to predict and ease the flow of electronic data across the nation's vastly expanding communications highways.

Last year, his efforts were rewarded when he was named a Presidential Young Investigator by the National Science Foundation, an award bestowed on researchers who have "the ability and potential for contributing to the future vitality of the nation's scientific and engineering effort."



Q. I assume that your father, an electrical engineer, played an important role in your career choice?

A. Yes, in being a role model, in helping me to see what a professor does. But I also attribute a lot to my mother. She provided a stable environment where I could focus my energies on my studies. I gained a lot of confidence from both of them, at one time or another.

Q. UCSD is providing your first teaching experience, after a brief career in private industry. Why did you switch from private industry to academia?

A. I don't think there was a conscious decision that I was going into academics. I think when the choice came upon graduation, I was leaning toward the academic side. Perhaps there was some parental influence there. My experience with industry was beneficial, but I felt I wasn't contributing as much as I could.

Q. What brought you to UCSD?

A. My wife is a native Californian, and she expressed an interest in finding something on the West Coast. And San Diego was right at the top of my list.

Q. Is UCSD strong in your area of interest?

A. There's a strong group here in the communications systems area. Before I came here, I asked my Ph.D. adviser at Illinois and other colleagues there about UCSD. They all recommended it highly.

Q. What type of preparation would a student need to have for studying electrical and computer engineering?

A. Mathematics is certainly a subject that comes up; it's used a lot in electrical engineering. But just as important as the symbolic manipulations of mathematics is an intuitive understanding of the concepts. Physics plays into that well.

Q. What types of opportunities do you see in the field of electrical engineering?

A. It's always hard to forecast what will go on in the country economically. However, we are moving toward a high-tech society that relies on electrical systems. So the opportunities seem to be growing. It's a field that is changing so rapidly, that it's hard

I think my own philosophy for teaching undergraduate students in electrical engineering is to teach fundamental concepts that can be used to further new technologies.

to put your finger on it at any point in time. I think my own philosophy for teaching undergraduate students in electrical engineering is to teach fundamental concepts that can be used to further new technologies. A lot of students here expect to learn specific technologies which they can apply immediately upon graduation. However, the technology is evolving so rapidly that if you educate the students in a particular technology, it might be obsolete before they graduate.

Q. What is your approach toward teaching?

A. I try to lay things out in very simple terms, and I know the students are capable of understanding the material. I certainly haven't found a concept that I understand that, given enough time, I can't convey to the students. One thing I do mention in my classes is that what they are learning in ten weeks is usually something that has taken mankind several years, or even several hundreds of years, to evolve. It's difficult to see how a student could not gain confidence from the progress he or she makes in this short time.

Q. Turning to your research, what impact did being named a Presidential Young Investigator have for you?

A. It gave me more confidence. It partially removes doubt about the worth of my research. It's nice to be recognized in that manner. In some ways, it has meant that I could spend more time teaching, since I feel confident that my research is going well and therefore I have more time to put into teaching.

Q. Could you summarize some of the areas of your research that are going well?

A. One area I have been working on for some time is flow control in communications networks. You can describe flow control as the science of how to decide when to let traffic, or information, into a network and how to control its flow through the network so it can be used most effectively. The example I always refer to is the transportation network where one form of flow control involves the regulated entrance ramps going onto highways. These ramps attempt to smooth traffic and control the maximum rate at which it flows onto the highway. In a lot of ways, this is analogous to flow control mechanisms inside a data network.

Q. Which do you enjoy more, teaching or research, or are they both about the same?

A. Which one I enjoy more is not constant. I do think, strangely enough, that my feeling towards both goes hand in hand. When my research is going well, I feel more motivated to teach a class even if it's completely unrelated to my research. I think the reverse is also true. When I am explaining concepts relevant to my research, it helps me explain those better to myself.

Q. Do you have any interests outside of your work?

A. I sometimes play the guitar. I had formal training on the trumpet and piano. I don't play those instruments anymore, though. The way I was taught music was to just translate the musical notes into a sound, the mechanics. Over time, I've forgotten how to read music, but I find the way I play the guitar now more enjoyable. I like to improvise and play along with the radio, and wish I had more time to do that.

TANYA LUHRMANN

ASSOCIATE PROFESSOR OF ANTHROPOLOGY

*T*anya Luhrmann is an associate professor of anthropology at UCSD. She came to the university in 1989, after several years at Cambridge University, where she researched and produced a ground-breaking study on contemporary British witchcraft and magic.

In conducting her research, which resulted in Persuasions of the Witch's Craft: Witchcraft and Ritual Magic in Contemporary England (Harvard University Press, 1989), Luhrmann immersed herself in a mystical world of secret meetings, tarot cards, witchcraft rituals, and magic robes.

A prize-winning scholar, Luhrmann received her B.A. summa cum laude in folklore and mythology from Harvard University. She earned her Ph.D. in social anthropology from Cambridge University in 1986. Her most recent book on the belief systems of the Parsi community in ancient India, The Good Parsi, is expected to be published next year.



Q. After eight years at Cambridge University, where you earned your master's and doctoral degrees, what brought you to California, and specifically to UCSD?

A. I met several anthropologists from the department here at a conference. They invited me to come teach for a term at UCSD. When I came out here, I realized the department was full of very smart people, and I figured I would be a better anthropologist for coming to this department.

Q. After living and working in England for so long, and before that the East Coast, moving to Southern California must have been quite a shock. How have you adjusted to Southern California and UCSD?

A. It's very different here than the East Coast, and England in some respects. The weather, of course, is very different, as is the social environment of the city in some ways. But the intellectual world, the world of the university, is actually very similar to Cambridge and Harvard. So that didn't require much adjusting. The weather and other things were more difficult for me to adjust to. I'd say the most difficult thing to adjust to has been being far away from the network of friends that I had on the East Coast and in England.

Q. Your 1989 book, Persuasions of the Witch's Craft: Witchcraft and Ritual Magic in Modern England, received a great deal of praise. Are you still studying witchcraft and magic? What are you currently working on?

A. I've just completed a project on India about a group of people called the Parsi Zoroastrians. They are followers of the ancient Pre-Islamic, Persian religion, and they came to India around the tenth century A.D. They became pioneers of industry in India, and the most British-identified community in India. I was initially interested in their theology, which grew out of my interest in witchcraft, and in the way that people's ideas help to shape their experience in the world in which they live.

I'm now working on psychiatry, which on the surface seems much more similar to witchcraft. The central question I explored in my research on

witchcraft was: how do apparently rational people hold apparently irrational beliefs? Psychiatry grapples with people who hold apparently irrational beliefs, and has a set of theories about how to deal with them.

Q. When did you become interested in anthropology and in alternative belief systems?

A. As an undergraduate, I was very intrigued with philosophy and also, although quite a bit earlier, with animal behavior. When I was about ten, I wanted to be a naturalist, just to observe and describe the ways that animals lived and communicated and behaved in groups. Then I became interested in philosophy. When I was still in college, I realized that I was less interested in figuring out the inner logic of arguments than I was in looking at people's irrationality or looking at the ways in which people's non-rationality governs their behavior. I became fascinated by myths and stories, and fascinated by the fact that people seemed to rely so much upon mythology in constructing their lives towards particular goals and ends.

So, I actually majored in mythology, but I decided I wanted to become a professional anthropologist. I didn't want to become a scholar of mythology so much as I wanted to look at the ways in which stories and images actually functioned in the day-to-day lives of human beings.

Q. Over the past couple of years, there seems to have been a real surge of interest in alternative forms of belief, in everything from the occult to astrology. As an anthropologist, how do you explain this?

A. I don't know quite what to make of it except I think that religions give people sets of powerful stories to make sense of their lives. I think people use these stories to model their sense of what it is to live a life. In the absence of established religions, people turn to alternatives like neopaganism in order to regain a rich storehouse of narrative.

Q. What kind of career opportunities do you think exist for today's anthropology graduate?

A. I think the opportunities are far more numerous than they're often thought to be. The most obvious application for an anthropology degree is to go my route, to get a doctorate and then to teach. But, actually, anthropology is generally useful for any kind of international work, whether you're working with refugees, or doing international business. If you're going to do a lot of work with the Japanese, for example, it's helpful to think about the national culture and the ways in which different cultures affect the ways in which people interact. You can also use anthropology as sort of an introduction to any kind of cross-cultural work, to translating, to interpreting, to working with art from other cultures.

Anthropology teaches you "people" skills. It's about the ways in which people learn how to interact with other people through their cultural experience. It teaches you about implicit expectations about people, about implicit communicative messages that you present to other people, and all the ways in which you communicate and interpret which are often somewhat hidden from your view. It's useful.

Q. What classes have you taught since arriving here, and what do you like about teaching?

A. The main courses I have taught have been Anthropology 106, which is the middle part of the required sequence for majors. I've taught a number of graduate courses. I've also taught a course called "Witchcraft, Shamanism, and Psychiatry" which was essentially a course about narrative, the ways in which people use stories to make sense of their suffering, in particular, and the ways in which their stories can go wild and create great damage, and also be used to cure and reduce some aspects of their suffering. And, I taught a course on Gandhi and how to understand Gandhi's enormous power at the time of the Indian independence movement, and what role culture played in carving out that powerful role for him.

Teaching is fun because it enables you to get up and talk to a group of people about your ideas. It's fun to engage people in a debate or engage them with a set of ideas and push them to look at themselves in a slightly different way. That's what I really enjoy: helping people shift their perspective a little bit.

Q. What kind of an impact do you think the study of anthropology can make on contemporary society?

A. I think it makes people more sensitive. It doesn't necessarily make them less judgmental, but it gives them more sophistication in judging. It poses hard questions. It helps you figure out what kind of expectations individuals from diverse backgrounds carry around with them, so it can help you judge their actions more effectively, and it can help you think more effectively about the nature of groups and the culture of group responses.

CECIL LYTLE

PROVOST OF THURGOOD MARSHALL COLLEGE

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ecil Lytle is the Provost of Thurgood Marshall College, formerly Third College, as well as a professor of music at UCSD. Established in 1970, the college was founded on the principles embodied in the civil rights movement—justice, equality, and social responsibility. Over the years, there have been numerous efforts to give Third College a proper name that suitably reflects its educational mission and social philosophy. Now, with the college's renaming for the late Supreme Court Justice Thurgood Marshall, it appears that the former Third College now has a name which reflects its spirit and its unique character.



Q. UCSD's Third College has enjoyed a very colorful and sometimes tumultuous history with the name Third. Does changing the name now imply some sort of turning point in the college's evolution?

A. Our new name, Thurgood Marshall College, is not so much a turning point, as it is a point of arrival. This name change has happened quite quickly and was hastened by the attention devoted to Thurgood Marshall following his passing in January 1993. So, 1993 is our transition year from Third College to Thurgood Marshall College. Those seniors who graduated in June 1993 proudly graduated from Third College. Students starting their college education a few months later are the charter class of Thurgood Marshall College at UCSD. We know that there will be some humorous slips of the tongue and confusing moments as all of us become accustomed to the change. But change is what we've always been about.

Q. What are you hoping to communicate to the campus community with this new name?

A. I feel that our appropriation of a more meaningful name helps us better communicate the vision that brought Third College into existence twenty-three years ago. The philosophic and intellectual outlook of Third College was set by the charter faculty, staff, and students in the late 1960s who wanted to establish an undergraduate college at UCSD that embodied the best and most challenging aspirations of the civil rights movement.

Q. So, your thinking is that the name Thurgood Marshall will best reflect these principles for the college?

A. Yes. Throughout that era, Thurgood Marshall worked quietly—and almost single-handedly—to advance the causes of ethnic groups, women, due process, and many other individual rights that Americans now take for granted. You know, while other cities burned, the city of San Diego and the UC system expressed the turbulent optimism of that period by creating a college that not only “emphasizes” cultural diversity, but demonstrates on a daily basis that inclusion is not the enemy of academic excellence. I think it is important also to recognize that, although Thurgood Marshall was a lawyer and jurist, his crowning achievement was in breaking down access barriers to education.

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Q. What message are you hoping to communicate to potential students about Thurgood Marshall College and its unique role at UCSD?

A. The demographic profile of the students in Thurgood Marshall College looks just like that of the other UCSD colleges. I would not want entering students to think that by selecting this college, they must become lawyers or judges. Indeed, about 33 percent of our students major in the sciences and engineering, another 40 percent or so are concentrated in the social sciences, and the remainder choose fields of study in the humanities and the arts. Personally, I would be delighted if they all felt the need to go out into the world and work for justice. Our approach, however, is to stress the notion that, regardless of a student's major, the life of Thurgood Marshall calls each of us to be better Americans. I would hope that the experience of attending a college that bears his name will make a budding physician more sensitive to his or her patients, a future lawyer more responsive to protecting individual rights, a prospective teacher more determined to make education a tool for personal and social enlightenment. Having Thurgood Marshall as an icon helps to remind all of us to "do the right thing" with our lives.

Q. So, you don't expect to attract a certain type of student necessarily?

A. As I said, I do not expect any change in our general student profile. Given our curriculum and academic programs, I think young people will continue to respond favorably when they are challenged both intellectually and personally. Since its inception, this college has meant community and has maintained the feeling of a small college within the context of a modern research university. Our three-hand logo symbolizes many things: cooperative learning between students, faculty and

staff; the interconnection of high academic achievement and social commitment; and a place where cultural diversity is more than a vapid mantra, but a way of life. With this philosophical outlook, we feel that our students develop both as scholars and citizens.

Q. Have there been any other changes or new additions to the college's academic programs, along with the new name?

A. This is what I mean by point of arrival. By comparison with other prestigious universities, UCSD is very young. In the twenty-three years since Third College opened its doors, students, faculty, and staff have initiated many important academic programs, including the Department of Communication, the Teacher Education Program, and Third World Studies. More recently, Professor Willie Brown has started an exciting course for students entitled *Methods of Inquiry* that encourages students to think about how to integrate the volumes of information they receive during college years. The Price Public Affairs Forum has allowed us to bring to campus distinguished speakers. Last fall, for instance, Derrick Bell and Glenn Loury met on campus with local high school students for a two-week debate on the issue "Race and Justice in America"; in a few months members of President Clinton's economic and health reform teams will be here to interact with our students on the president's economic and health care reform packages.

We continue the course Partners at Learning (PAL), where students receive academic credit for training and placement in elementary schools as tutors. When I visit a local elementary school and see one of our engineering students sitting in a corner listening to an eight-year-old read a book, or

witness one of our history majors introducing algebra in Spanish to a cluster of immigrant children, there is for me a reaffirmation of the continuation of Thurgood Marshall's work.

Although only two years old, the PAL Program is what this college has always been about. Marshall became famous for his 1954 U.S. Supreme Court victory in *Brown v. the Board of Education*, but he often said that *Baker v. Carr* (the voting case that established the principle of one person-one vote) was more important because its impact reached beyond our shores. In that same spirit, our PAL tutors feel that they, too, are empowered to have an impact far beyond the traditional college experience. I think Thurgood Marshall would be as proud of our students as I am. He would also be pleased with the planned activities of the new Marshall Institute.

Q. What kind of role will this new institute play at UCSD?

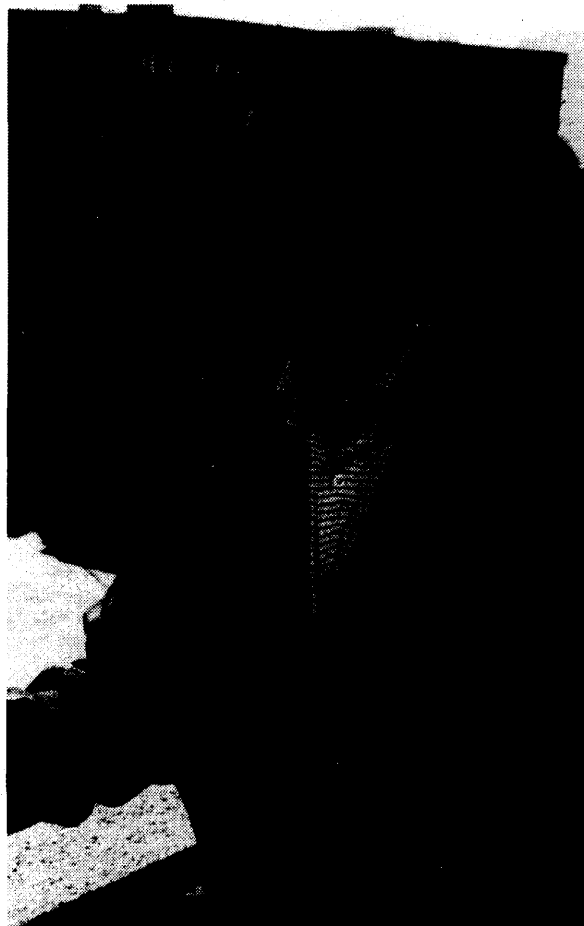
A. Although the concept of the Thurgood Marshall Institute is still evolving, it is already clear that the institute will have three main objectives. First, undergraduate students will join with political science professor Peter Irons and other faculty to conduct and publish research on the issues of justice and equality; second, the Marshall Institute, in conjunction with UCSD Extension, will train junior and senior high school teachers in the teaching of the U.S. Constitution; and finally, the institute will host annual conferences on topics related to the U.S. Constitution and individual rights. In addition to the topical interests of the institute, we want to establish and affirm the best educational aspects of the UCSD college system. Therefore, undergraduate research at the Marshall Institute will be a powerful complement to instruction at UCSD.

GEERT SCHMID-SCHOENBEIN

PROFESSOR OF APPLIED MECHANICS AND ENGINEERING SCIENCES

Geert Schmid-Schoenbein was born and raised in a small town in southern Germany. As a young boy, his fondness for horseback riding began to consume a great deal of his time. His father, noting that his studies would eventually suffer, sent him to boarding school in the Black Forest. Schmid-Schoenbein went on to complete his undergraduate work in physics at the University of Giessen.

Schmid-Schoenbein came to UCSD as a graduate student in 1971. After earning his master's degree and Ph.D. in bioengineering, he accepted a position at Columbia University where he had the opportunity to pursue his research interests in microcirculation. He returned to UCSD in 1979 to accept a faculty appointment in AMES and work with his colleagues and mentors, Drs. Yuan-Cheng Fung and Benjamin W. Zweifach.



a student that it would have such an impact on the rest of my life.

Q. What events along the way helped to shape your career?

A. I was fortunate to have the opportunity to study physics, biology, chemistry, and mathematics with teachers who taught me to love learning. To learn cut-and-dried mathematics is not very much fun, particularly if you cannot see the applications for it, but the personal touch of good teachers, and the enthusiasm they radiated, helped me to develop a devotion to my profession.

Q. What direction has your research taken?

A. We are interested in how materials, such as ions, gases, proteins and lipids, get from the bloodstream into the tissue and into the cells and how they are metabolized and come back out into the bloodstream. Why is it that under certain circumstances a part of the circulation fails? We are learning that in many diseases the failure of the small blood vessels and capillaries is not necessarily related to what happens in the large blood vessels. This occurs in cases where suddenly local areas in the periphery of your circulation are no longer functioning normally. This can occur in different organs, such as during myocardial infarction in the heart or in stroke in the brain.

We are interested as bioengineers to find out what goes on in an organ, and to develop models in which we hope to simulate it. We have no

Q. What brought you to UCSD?

A. What attracted me to UCSD is that I had some great teachers. By chance, I had the opportunity to meet Dr. Zweifach at a meeting in Munich and learned that UCSD was one of the few universities in the United States that had a program in bioengineering. I didn't stay because of the sunshine or the equipment or the buildings. I stayed because there were some great teachers to work with.

Q. How did you decide to major in bioengineering?

A. Before I knew what the significance of the field really was, I was drawn into bioengineering by going to the lectures of good teachers. I was attracted by the idea that you could do something in engineering that hasn't been done before, namely to try to apply it to biology and to work on problems in life science. I had no idea when I was

My ultimate dream today is that one day we may actually be able to write down a mathematical theory for myocardial infarction or stroke which is quantitative and predictive, that will tell what happens in an organ that is going to fail.

mathematical models to test at the moment. We have to know a lot about the tissue and physical properties of the tissue and cells. I think that bioengineers are in a position to start to develop models which can be tested and written down in the form of equations.

My ultimate dream today is that one day we may actually be able to write down a mathematical theory for myocardial infarction or stroke which is quantitative and predictive, that will tell what happens in an organ that is going to fail.

Q. How can you obtain this information?

A. The information we need has to come from testing the whole circulation. We can't understand it from tissue culture. I can give you an example. Why is it that individuals, such as juvenile diabetics, become blind, and their capillary network in the retina has local regions which occlude?

We do have to use animals—a real retina, a real circulation, and a real diabetic to work with. In animals, we can study this in detail and establish very important mechanisms which, then in turn, we can test in humans.

We have been able to show that, in fact, one of the blood cells in the body is actually responsible for the occlusion of those capillaries. We are now in the phase of asking why these cells are doing it and are they doing it in humans?

Q. Do you have concerns about using animals?

A. My attitude is that we learn as much as we can from cells and tissue cultures. We need to use animals very sparingly and they need to be treated in such a way that there is no unnecessary pain. The animals need to be treated in the way you expect to be treated when you have to go into surgery.

Of course, the use of animals is highly regulated, and one has to make every effort to ensure that animals are used only for information which does not already exist. We are very busily going about trying to develop mathematical models so we then won't need to use animals.

Q. What are the job opportunities for bioengineering graduates?

A. I see long-term opportunities for bioengineers because of the need for quantitative techniques in medicine. Companies that hire biomedical engineers are companies that make instruments for hospitals—surgical, monitoring, and imaging. The up-and-coming biotechnology industry needs biomedical engineers to participate in the development of drugs and other products.

Management opportunities are open in health care facilities. For example, the Veteran's Administra-

tion Medical Center has programs designed to train biomedical engineering students to serve as heads of bioengineering departments.

Q. What is your advice to young people?

A. Specifically, in engineering you do need to take a few courses in mathematics, physics, biology, and chemistry. Find a good math teacher!

Develop a love for learning. Don't take so many courses. Learn something that is of long duration and won't become obsolete. Take a few courses that are not directly applied and do well in those. Because in the end, it is only your ability to work in a specific area that will really count.

Q. What else would you tell them?

A. You should read history, it's very important. Read biographies of famous scientists. Read or see films and see these individuals—come close to them, almost touch them, and then see if they inspire you. Is there something these people have said or that they radiate that attracts you? It's the personal touch that's important.

MARIA SAVOIA, M.D.

ASSOCIATE DEAN FOR CURRICULUM AND STUDENT AFFAIRS, SCHOOL OF MEDICINE



The daughter of physicians, Maria Savoia began her first year of medical school at Harvard in 1972. The class was addressed "gentlemen" and instructed to wear shirts and ties.

As a new physician in 1976, she came to UCSD Medical Center for her internship, residency and chief residency in medicine, and a fellowship in infectious diseases. She joined the faculty at the School of Medicine in 1984 as assistant chief of medical service at the San Diego Veterans Administration Medical Center.

During her career, she developed an interest in students, medical education, and the concept of lifelong learning. She was appointed associate dean for curriculum and student affairs in 1990. In the seventeen years since she was a medical student, the learning environment for medical students and the practice of medicine have changed quite a bit.

Q. What's different for women medical students today?

A. There are more women students today. Women were very few in my mother's graduating class at Columbia in 1936. Harvard only began accepting women in 1945, and the number of women remained low and relatively constant for a number of years. That has changed now. UCSD School of Medicine's class of 1996 is 48 percent women.

There are also more role models for women medical students—there weren't many before. Half of being a success is having the confidence to succeed, and good role models show women they can succeed. I think women are more visible and more accepted in medicine now.

Some things have changed; others have not. Advancement and salary have remained issues for women faculty. So, there is still room for improvement.

Q. What made you choose UCSD Medical Center for your residency?

A. We already were a two-career family—I was married before I went to Harvard Medical School (to UCSD physician Robert Steiner, M.D.). We looked at UCSD when my husband, Bob, was doing an internship, and I almost came to UCSD then. Later we were looking for something that would be good for both of us and we both liked San Diego, so we came out here.

We thought we would come to look at the West Coast, see what it was like, and go back home in a few years. The West Coast is great and UCSD turned out to be a really wonderful place to work. We may never leave!

Q. What did you like about UCSD?

A. I felt there was a great deal of emphasis on teaching here. People were really open and inquisitive, and thought creatively. The atmosphere at UCSD was very conducive to learning. I enjoy being in an environment where learning is going on.

Q. Why have you stayed in an academic setting?

A. I've always liked to teach and I've always liked learning. One of the main reasons I've stayed in academics is that I like the interaction between students and faculty. Physicians can have a lot of

Physicians can have a lot of effect on patients, but if you have an effect on the patients' doctors, your effect is magnified. Training good doctors is extremely important to providing good patient care.

effect on patients, but if you have an effect on the patients' doctors, your effect is magnified. Training good doctors is extremely important to providing good patient care.

One of the things that interested me in taking my current position was the effect the associate dean could have on curriculum. The faculty really is in charge of the curriculum and there are faculty committees that deal very effectively with curricular issues, but the committees do have turnover, and it is hard to make curricular changes without continuity. So I see the role of associate dean for curriculum as helping to provide some of that continuity and as facilitating curricular change.

Q. What has changed in medical education?

A. Medical education at UCSD has always been good, emphasizing both basic science and clinical programs. There is a good balance of responsibility and supervision. Students have enough responsibility to learn how to make decisions and know what they're doing, and at the same time they have supervision so they are not left on their own.

But the way we teach has not changed much, while the patient base has. More medical care is delivered in the outpatient setting today than ten years ago, but medical education is still focusing on the inpatient setting. There is a national push for an increased focus on primary care, and curricula also need to reflect this to provide physicians who can meet the needs of their future patients.

We need to go back to the roots of medicine: building good doctor-patient relationships. UCSD recently has begun a program to institute the use of standardized patients (actors who play the role of a real patient) in training our students. And there is more of an emphasis on problem solving and direct patient-care skills.

Q. What are the challenges facing medical students today?

A. We live in exciting times. New technology has increased our ability to help patients. Medical research is opening new frontiers. Approaches like gene therapy are increasing our ability to intervene to treat patients at a basic level—treating real causes, not just symptoms.

New techniques also bring drawbacks. We must help teach our students how to make the medical system work for the individual patient, and the positive impact that preventive medicine can have on the patient and the medical system.

Q. If you could make sure that all UCSD School of Medicine graduates learned just two things, what would they be?

A. I would want them to love learning. If they are excited about the science of medicine, intellectually putting all the pieces together to figure things out, and if they are excited about the art of medicine, and interacting with patients, they'll learn everything else.

The other thing I'd like students to learn is what it means to be a doctor. I would like them to treat patients with compassion and respect, and to be people with integrity who deserve respect themselves. I'd like our students to be physicians who are first and foremost dedicated to the welfare of their patients.

MAE BROWN

DIRECTOR OF ACADEMIC ADVISING, THIRD COLLEGE



Mae Brown has spent a substantial part of her administrative and professional career at UCSD, advancing from a clerk-typist job in the Office of Admissions to her present position as director of academic advising for some 3,000 Third College students. Along the way, she returned to college as a re-entry student to complete her undergraduate degree, then earned a master's degree in guidance and counseling from San Diego State University. She currently is a doctoral candidate in the joint Ph.D. program between San Diego State University and Claremont Graduate School. Her area of research involves the study of higher education administration, educational policy, and the impact of race and gender on leadership style.

Brown began her career in academic advising at Warren College in 1978, and within a short period was appointed head of academic advising at Third College. She feels that a key to being successful at UCSD—or within any large, complex organization—involves “preparation, tenacity, a desire and commitment to aspire to excellence, and the wise use of available resources.” This, she says, is a message she shares daily with the undergraduates with whom she interacts.

In addition to her university responsibilities, Brown contributes to the community by conducting early academic preparation workshops for students and parents, and also is a local faculty member for the National Issues Forum, which trains individuals in the community to become moderators.

Q. How would you describe your role in academic advising?

A. I frequently wear several hats and attempt to keep them all in place at the same time. For example, my position brings me into contact with students, faculty, staff, parents, and other administrators on a daily basis. I serve as staff assistant to the provost and the Third College Faculty Curriculum Committee, providing input on curricular issues and the implementation of academic policy; I represent the provost and Third College on the campus and in the community, and I provide direction and oversight of the academic advising unit. Not the least of my functions is working with students, from the point of admission to the date of graduation. My personal motto is that students are our most valuable resource, so having a “student-centered” unit and staff is of primary importance to me. Yesterday, for instance, I received a call from a faculty member expressing

concern about a student who was distressed about a grade she had received. Of course, I asked that the student see me. This is one of the wonderful benefits of the small cluster college system, where the colleges serve as the students’ “home base.” At any rate, this student had come from a high school where she was at the top of her class, and had now received her first failing grade. We talked about the nature of the university, the expectations of the faculty, the adjustment period, the availability of support services, and the fact that she could really do well at UCSD, but that she had to reassess her priorities, study techniques, and time management skills. This ongoing attempt to help the student’s academic adjustment to the university is one of the academic adviser’s roles. In general, academic advisers provide curricular advice, assist students with clarification and goal setting, develop and implement a variety of educational programs, and act as referral agents.

Q. What advice would you give students about “making it” at UCSD?

A. First, be wise consumers. Become knowledgeable about all available resources and take the initiative to use those resources in a timely and consistent fashion. Second, develop strong ties with the faculty and teaching assistants in the academic departments. Also, regard your college as “home base.” The provost and his or her staff are

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My personal motto is that students are our most valuable resource, so having a "student-centered" unit and staff is of primary importance to me.

"student-centered" professionals and are available to assist you in becoming acclimated to your new environment. Don't take the quarter system lightly. The rapid pace can be quite intimidating, but it also provides an opportunity to examine your time-management skills. Also, it's important to develop a passion and thirst for knowledge, and to sharpen your critical thinking and analytical skills. And lastly, become involved in your college, campuswide, or community activities. The opportunity to broaden your academic and intellectual sphere through public service and leadership can be personally rewarding.

Q. What advice would you give a student in selecting a major?

A. I would encourage students to examine their strengths and weaknesses, their likes and dislikes, take a course or courses in the area of their interest, speak with advisers about the nature of the major, speak with peers, parents, those involved in the field, and participate in programs and activities designed to assist students in this decision-making process. For example, the annual "Undecided Majors Faire" sponsored by the five undergraduate colleges and academic departments is an excellent resource.

Q. What do you advise in regard to educational planning these days—a stress on science, humanities, or arts?

A. My personal advising style is to help students examine all options in light of their interests, strengths, academic and career goals. I believe that students should be encouraged to pursue any field of study that they enjoy, as long as that enables them to be their personal best. I also encourage

students to stretch intellectually. Given the strength of the UCSD curriculum, students are provided a wonderful opportunity to grow and develop intellectually.

Q. Can you see any difference in the students of today as compared to those of five or ten years ago?

A. Yes, I think that today's students appear to have more of a humanistic bent. The Third College Partners at Learning program, as well as the Volunteer Connection, seem to be quite popular. I see more of a willingness to give something back to the community, whether working in a soup kitchen or junior high school classroom.

Q. How would you rate UCSD?

A. From a student's perspective, it has to be one of the best "buys" in public higher education. The campus provides the opportunities of a major research university, while at the same time offering the personal touch of a small liberal arts and sciences institution. The cluster college system makes this concept a reality. UCSD is ideal for the serious-minded student. From the staff viewpoint, it's an extremely rewarding place to work. There is an array of opportunities available which allows us to grow personally and intellectually.

Q. What kind of impact do you hope to have on students?

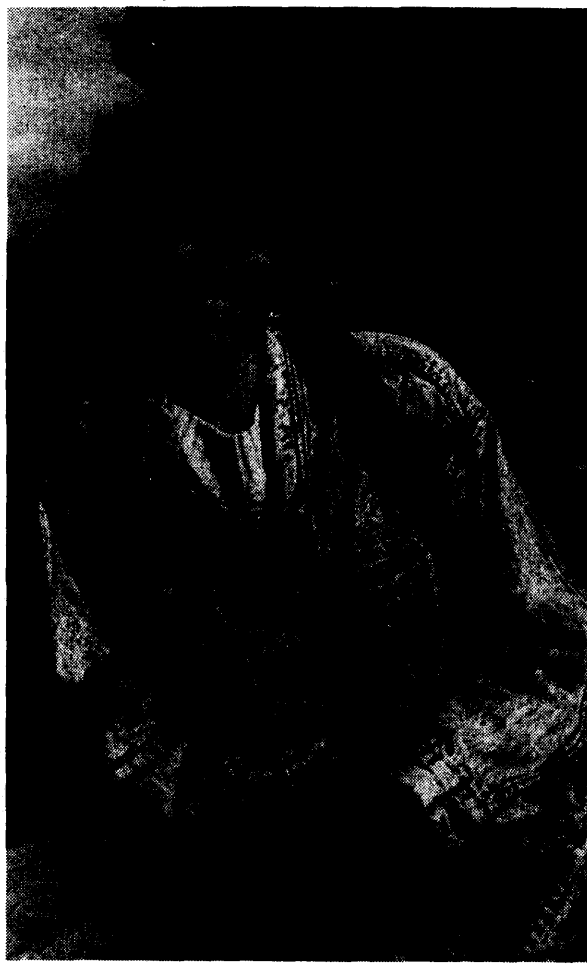
A. I hope that they will see me as a caring, student-centered professional, someone who can serve as a role model and example. Yet it also is important that they see all of us, whether faculty or staff, as fallible human beings. That realization can serve to inspire and motivate students to be the best that they can be, regardless of life's temporary hindrances.

KERRY BENSON
WARREN COLLEGE JUNIOR

*F*or Kerry Benson, the road to UCSD has had many twists and turns. Born and raised in Phoenix, Arizona, Kerry started her college career at Bakersfield Community College. Later she moved to San Diego to attend San Diego State University, but then finances took her back to Bakersfield. Finally, she moved back to San Diego, enrolled at Mesa College, and then transferred to UCSD.

"I had studied very hard when I was at community college and came in with about a 3.7 GPA," said Kerry. "I thought that would get me in and it did." Her hard work paid off. Now Kerry, twenty-five, is pursuing a degree in psychology, while also working as a clerk in her college's advising office.

One of Kerry's favorite ways to cut loose is country and western dancing. She also makes time for nurturing herself through her church and prayer.



Q. Why did you choose to follow the transfer route in coming to UCSD?

A: I've always known that it wasn't going to be feasible for me to spend four years at a university or at a state college. I would need to transfer from a community college, which was great for financial reasons. I've been to two community colleges and they offer courses of nearly the same caliber as the university. You can do it for so much less [money] and still get your general-education requirements done. For me, it didn't make much financial sense to spend four years at the university, because my family couldn't afford it and I couldn't afford it.

Q. Generally, transfer students live off campus and commute. Why did you decide to live on campus?

A. I wanted to get a sense of really going to college and being a part of the university, not just

attending classes. It's also convenient. You can walk to classes without worrying about finding a parking space every morning.

Also, International House, where I live, provides a place to meet people from different parts of the world, many of whom speak different languages. I House is a really good way to learn about people because there is more diversity there than anywhere else on campus. My roommates are from New Zealand, Australia, and the United States, and I have met people from all over the world — from Italy, Africa, England, and Russia.

Q. The curriculum at Warren attempts to link a student's academics with his or her career goals. Is that true for you?

A. Yes. I'm in "Ethics and Society" this quarter, and already we're emphasizing aspects of reasoning and thinking so we won't take for granted what we've always thought of as the right or wrong thing to do. And possibly that will allow us to make better informed decisions.

A lot of the time people meander through life having been told that something was right or wrong, but they never really questioned it or logically thought "Why am I doing this?" This class encourages you to think about why you are doing what you are doing, and to consider the consequences. We examine different ways to

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make decisions, but not necessarily whether they're good or bad. It simply gets you to think about what you're doing.

I like the diversity of Warren's GE requirements—the formal skills, the ethics course, the two programs of concentration. It's a very well-rounded approach, which I think is important for anybody who is planning to go out and work.

Q. You work part-time in the Warren Academic Advising Office. From your vantage point, do students often turn to advisers and other staff for assistance?

A. Oh yes. Definitely. I've gone to several drop-in hours, plus working in the office I get to hear from people with problems every day. The advising staff is very accommodating to students and I received a lot of support and information from them.

I don't think the university's staff should be overlooked as an excellent source of information and a connection to what is happening on campus. They see students constantly. They don't spend time on research; instead, they have hands-on

experience in dealing with students who are attending courses, having problems, and making decisions. They can offer a lot of help.

Q. Any other advice?

A. Students should learn to keep their eyes and ears open and not to be afraid to ask questions, to speak out, and to talk to people. You have to be aggressive. You can't just wait for things to happen. You have to go out and get them, and it's not a bad thing to work for what you want. That's what I think is important to stress.

Q. You are involved in your church. How do your religious beliefs support you in life?

A. I wasn't involved with church activities as a younger student, but the older I get the more involved I get in personal growth. Church is a good place for that to happen. People go because they want a sense of belonging to something that isn't threatening, rather something that is caring.

It's very motivating. School is a big challenge, especially as a transfer student and as an older student. You have to have something in life that makes you feel important and positive, because school can get kind of difficult. That's what church offers for me. It makes me remember that there is life beyond school. It keeps my perspective about my life and about what I'm doing and where I'm going and enables me to keep a good sense of

humor and feel light about things and not be so serious and tense and worried. Believe me, it's a lot of those things.

Q. How would you, as someone who has experienced three other college campuses, describe the student body here?

A. Students at UCSD seem a lot more responsible academically than I've seen at any other campus. I think because it takes a certain amount of determination to get here. You have to really want to be here. Therefore, I think most people take more advantage of what's going on here.

Q. When did you realize you had made the right decision in coming to UCSD?

A. Coming to the university is scary. It's new, it's big, and there are a lot of people. Classes are hard. You worry about money. But when you stop and think, "What am I doing here?" you know that when you get your degree it's something that you'll have for the rest of your life, and it will say UCSD on it. That's a ticket you can carry around with you for the rest of your life. You can say that you spent a good deal of your time, energy, and money doing something productive.

A degree from UCSD is a really valuable degree. There are tons of reminders that I did the right thing. Knowing that you're going to graduate from this university itself says, "That's what it's all about!"

ORREN WEBBER
MUIR COLLEGE SENIOR

Classmates at the O'Farrell School of Creative and Performing Arts were surprised to learn Orren Webber was planning to attend UCSD. They assumed their theatrically talented friend had changed direction to study biology. Not so! Orren, twenty-two, discovered UCSD's arts programs and will soon graduate with a media degree.

Orren learned the ropes of college life quickly, first through Summer Bridge and then on his own as co-founder of his college's cultural society and as director/producer of the Muir Musical Ensemble. "I was never a take-charge kind-of guy, but here I grew a lot on the self-awareness/self-confidence scale," he said.

Often accused of "doing too much at one time," Orren is a go-getter with direction. He is producing a second musical for his college (Sondheim's *Into the Woods*) and a film for the Undergraduate Arts Festival. After graduating, Orren hopes to pursue a career in the film industry.



Q. You attended O'Farrell School of Creative and Performing Arts here in San Diego. Describe your high school and how it prepared you for college.

A. First of all, it's not "Fame" at all. We didn't dance in the hallways and that sort of thing. My school was grades four through twelve, with about 1,200 students total. My graduating class was 108. You just about knew everybody and everybody knew you. We got to be a tight-knit family. A lot of times we called our teachers by their first names because we spent so much time together. She wasn't just my teacher, Ms. Bihar was my buddy.

O'Farrell prepares you to be a role model. Once you're at the high school level you get more involved with productions, and the younger students start to look at you as sort of an idol. In

that atmosphere you learn to act as a role model — don't ditch school all the time because you don't want to set a bad example for the younger students.

Q. How did you decide on the visual arts/media major?

A. I didn't until after Summer Bridge (a residential program for entering SAA and EOP freshmen). I came to UCSD as a communication major with no idea of what I wanted to do. One of the counselors at Summer Bridge told me about the media major, that it's more of a hands-on film and photography major. I looked into it and I decided to change my major before school even started.

Through film and video I was able to bring in everything that I had worked on in high school. In high school it was mostly theatre — music and the performing arts. It helped a lot to use my theatre knowledge, as far as staging, blocking, and my visual sense.

Q. Describe your transition coming from such an intimate high school environment to a large university.

A. It wasn't that bad at all. I think Summer Bridge helped me out a lot. During Bridge they ground it into your head: "You're going to have classes with

In a small college atmosphere the best people to know are the staff, like your deans, your provost, and your academic advisers. In a small college system they can give you more attention.

300 people. That's the way it will be." It wasn't traumatic at all, especially once I finished my GE classes. The media major is only 200 strong, so our classes are very small—twenty-five people at the most, and even that is big. The only thing I had to deal with was the lecture classes, but that wasn't bad because I was prepared for it.

Q. Everyone is concerned about being in a classroom with 300 or more students. How did you deal with your large classes?

A. The first thing I did was seek out all the child geniuses in class. Then I became really good friends with those people. You sit in the lecture and ask a lot of questions. After lecture, if you don't understand something, you go to those people and talk to them about it.

In the beginning, I had a hard time with my writing assignments. I'm not a good analytical writer, so I started going to OASIS tutorial service to work on it. The OASIS staff helped a lot. However, I'm still more on the creative side of writing, rather than the

analytical. I found a good friend who was a literature major, a creative writer. She was great at diversifying the papers through her creative skills, while not forgetting what you're analyzing.

So, I found a friend to help me. What got me through college were my friends. Friends have always been important to me—the most important. They help tremendously.

Q. What are the advantages of the five-college system?

A. In a small college atmosphere the best people to know are the staff, like your deans, your provost, and your academic advisers. In a small college system they can give you more attention. UCSD's five-college system is set up so that you don't have to deal with 14,000 students. Instead, you're dealing with maybe 1,500 students or 2,000 students. I got to know the Muir staff in my first quarter because I was in the academic advising office a lot.

Q. How does that make you feel?

A. You feel really important. If you're talking to a new freshman, you say, "Let me introduce you to the provost, the man in charge of the college." It makes you feel important, while at the same time you don't think about it because they're just other people to you. Also, it's a quick way to get letters of recommendation. An employer won't generally know how the college system is set up, so if I get a letter of recommendation from the dean and the provost they'll think: "Wow! You must have been doing something right."

Q. Muir College has a long-standing commitment to humane goals and purposes. In what ways has that commitment transferred to you?

A. I'm very environmentally conscious now. I wasn't when I came to college, but now that's one of the most important things to me. "Recycle, recycle" is what they say at Muir. I remember one time I got caught throwing a can into the trash. Now we have recycling bins in all the dorms. When I go to buy something I check to see if it's biodegradable, and I only ask for paper bags because they're the lesser of two evils.

In addition, I've done so much community service here, and a lot of Muir students do that sort of thing. They get involved with the freeway clean-up committee, work with children, and so on. I think everybody at Muir has some sort of commitment to the community, not only the college community but the outside community as well.

Q. Any words of advice for other students?

A. The biggest thing I stress with people is involvement. Future employers look to see how good your social and leadership skills are. Even if you're only joining the Star Trek Club. Any type of involvement at college is beneficial.

I think college is not just picking up book knowledge. It's also developing social skills. As part of your education it's important that you at least do a couple of things with your college. There are so many things out there; you could even start your own club. Get involved. Big emphasis, in big letters: GET INVOLVED. That's my thing.

AIDA BULLEN
THIRD COLLEGE FRESHMAN

*A*ida Bullen, eighteen, brings the perspectives of three countries to UCSD — Mexico, Panama, and the United States. Aida's family spent many summers in her mother's native Mexico, but most of her childhood was spent in her father's homeland of Panama. Now her family lives in the suburban community of Bonita Vista, just a few miles north of the Mexican border.

Although undecided about her major, Aida is looking into the humanities and ethnic studies (her first interest was biology, UCSD's most popular major). She describes the pace here as "extremely hard" and "very intense," though she's managed to stay on top of her studies while also being very active at her college. "It's a good way to learn that time is very precious," she said with a smile.



Q. Was it a difficult decision for you to leave home?

A. Actually, my parents were the ones who said, "Why don't you live on campus your first year, so you can learn more while you're there?" My parents believe a lot in education, because they've been in school and know what's useful — for example, living on campus rather than staying at home and commuting. With the amount of homework that I have it would be hard for me to participate in after-school activities and also do my academic work, plus drive back and forth to school.

Q. You and nearly 86 percent of our freshmen chose to live on campus. What is it like living here?

A. It's great. I wouldn't have it any other way. Compared to my friends who are commuters, I know the campus a lot better. Living on campus

gives you an opportunity to meet other students, so you have more friends and more resources. It also makes it easier to attend activities, because attending the university is not only going to classes. It's also participating in extracurricular activities.

I just started playing water polo and it's great. It's a good way to meet people. Extracurricular activities are always great for that reason, and a sport in particular. Personally, it helps me release my frustrations and stress. Water polo is fun because we work out *and* we have a good time.

Q. Describe your transition from living at home to moving in with three people you didn't know.

A. It was very hard for me, but I think the experience has helped me. I've matured and I have learned to accept other people the way they are. It was hard for me because I expected everyone to be like me, but you grow up. You have to appreciate everyone and their views.

I was expecting people to be just like me — in the same way I think, the same way I clean, the same way I arrange my hats. I ended up rooming with people who arrange things differently. I was expecting others who would be close to what I am.

Then again, it would be kind of boring if we did the same thing the same way. It adds a little spice to our life to argue a little bit and to learn to do things differently.

It took me a whole quarter to become comfortable. Every day I would say, "Okay, maybe I'm being too sensible and too straight with my points of view." My classes helped because they dealt with different cultures and peoples, so I applied what I was learning and tried to be more open minded.

Q. What tips can you share with a new freshman?

A. First of all, be energetic. Look at things in a positive way. Have a very positive frame of mind, and don't expect anything at all. Don't expect to get all A's, and don't expect a clone of yourself as a roommate. And use all the resources on campus. Take advantage of people, because they're all willing to help you. Be nice and enjoy.

Q. How would you describe the academic pace here?

A. Extremely, extremely hard. Intense, very intense. The quarter system makes it very hard, especially when you come from a high school with semesters. Now you only have ten weeks. In addition, the class work is very hard and you also have time constraints, so that makes it doubly hard.

It keeps you on your toes, makes you become responsible, and helps you to learn how to manage your time. It's a good way to learn that time is very precious.

Q. "Dimensions of Culture" (DOC) is one of the general-education requirements at Third. What are you learning about yourself and other cultures by taking this class?

A. It's a great class. You are exposed to many different ideas that we learn to appreciate. If you're open-minded, you can learn a lot more about your own culture by looking at others. I discovered a lot of things that I didn't know about myself. Some of the topics we covered were very controversial . . . I think all were controversial . . . then again, we need to talk about those things.

We talked about ethnicity, race, sexual orientation. They were very broad subjects: How culture relates to our views of ethnicity and race and sex. Since I come from an interracial background and a very open-minded home, I think my views were molded. They didn't change radically, but they did change a little.

Q. Was there ever a time in class or when you were doing a reading or writing assignment when something just hit you and you said to yourself, "Wow, I didn't realize that?"

A. Yes, many times and I felt kind of scared. That's why I liked it so much. We were encouraged to participate and share what we felt. Many times we realized that it's not just ourselves, but that there are several other people who think the same way. Other times we came up with ways in which we could relate our different kinds of thinking. It was really interesting.

Q. What else about the Third curriculum do you find attractive or unique?

A. Third College promotes leadership. I like that aspect a lot. They promote free thinking through classes like DOC and through activities or clubs, such as TASC (Third Activities Student Committee) and ACT (Active Community at Third). Students at Third College are given an opportunity to become leaders, to be themselves, and to grow individually.

Q. Having spent time in Mexico, Panama, and now here, which culture do you tend to identify with most of all.

A. I'm Pana-Mexican. My heart is big enough for all three, for all countries. I don't have a complex about any nationality or my ethnicity. It's a pretty big world. [In the future,] I think I'll go where my heart tells me to go.

I was ten when we moved back to Mexico from Panama. We lived in Tijuana and I had a big culture clash. Mexico and Panama are two totally different countries. It's like comparing Mexico to China, or something like that. Panama and the United States have a lot more in common than Mexico and Panama, but I even had a culture clash when we moved here, but not as severe as I did in Mexico.

Q. Do you think that you may look at things a little differently because of your varied background?

A. Yes. We all look at things according to our own experience. So, if I come from a different experience and different background, I will see things differently.

Q. And how do you share that with people you live with, those you come into contact with?

A. Just by being myself, by everyone being themselves. You're sharing already. I talk with my roommates, and just talking conveys ideas. My three roommates and I are all from different backgrounds, so we know a little more about other cultures because we sit down and talk.

MARK PASKOWITZ
FIFTH COLLEGE SENIOR

Though he's pursuing a double major in economics and applied mechanics, Mark Paskowitz's true love, academically speaking, is Russia. It all started from an overheard conversation in high school, where a counselor pushed the idea of an "international" education.

Mark, twenty-one, has taken every Russian literature course UCSD offers. He also spent one semester studying in St. Petersburg, Russia. As an honors student, Mark channeled his interests into a scholarly research paper on the similarities between the Czarist and communist governments of Russia. He was also selected as a Regents and Revelle Scholar, which provided a substantial scholarship, graduate student library privileges, and priority class registration.

When not studying, Mark is a great advocate for relaxing. He also enjoys playing rugby and "kicking back" with his friends.



Q. Fifth College had just been established when you entered as a freshman, yet it was your first choice. What attracted you to this new college?

A. At first it was just an overheard remark from my high school counselor. She had read about this new college at UCSD. She felt a student could get an international outlook, study something like Russian or Chinese, and then have a lot of opportunities in the future.

I thought that was interesting so I started looking into Fifth and I liked it a lot. I always figured I would go into engineering, but I wanted to keep my education broad-based. It seemed like Fifth would give me the opportunity to develop more than an engineering focus.

Q. How did you get hooked on Russia?

A. That also started from that same overheard conversation. I had taken French in high school

and was pretty tired of it. I really didn't want to take Spanish because everybody was always telling me that you have to learn Spanish if you live in Southern California. So, that was my little rebellion against that. Russian just seemed neat.

I loved my language class. Rebecca Wells (lecturer in literature) was such a great teacher. She got a lot of enthusiasm running through the whole class. Hers was the first class I walked into as a freshman. It was Russian 1A. She just walked in and started speaking Russian. It was a little scary at first, but her style was great. She made us comfortable and learned everyone's name. She made a difficult language easy.

Then, a seminar I took with Professor Tim McDaniel (professor of sociology) really got me into the current situation. I always tried to keep up-to-date on what is going on in the world, but his seminar really gave me an idea of the complexity — the amazingness — of Russian history. There is so much that has gone on in that country throughout the years. It's huge. It's grand. The more I studied it, the more I liked it.

Q. At one point, you traveled to Russia as a student in the Education Abroad Program. Tell us about that experience.

A. We left on August 29, 1991. We were scheduled to leave a few days earlier, but we were

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postponed because of the coup. That was really a shock. I was on the early train to L.A. and I saw somebody's paper out of the corner of my eye. It said, "Gorbachev Ousted."

Fortunately, that didn't last very long and our departure was delayed only a couple of days. We wound up getting there at the end of August and we stayed through the middle of December. We studied at the Alexander Herzen Russian State Pedagogical University in St. Petersburg, or in Leningrad for the first month and afterwards St. Petersburg. We took a couple of trips to Pushkin, which is like a suburb. We went to Riga, Kiev, and Moscow. We saw a lot and made some really good friends. We had a great time.

Looking back, it was probably the best time to be there because it was right after the coup. Even though there was some uncertainty, a lot of things loosened up — the Communist Party was out and a lot of barriers against reform were tossed out the window by Yeltsin. For the people, life was very uncertain but what was happening provided a big release of tension.

Q. How do you feel Russia will figure into your future?

A. I hope I'll have the chance to return. I'm thinking about getting a job that would take me to Russia, because I want to go into aerospace engineering. I think there is a future for civilian development in space, and the Soviet space program is very strong — one of the strongest in the world. I've been reading that a few American companies are starting joint ventures with Russian companies, so I'm going to write them some letters and say, "I've got an engineering education. I speak Russian. I've been there and know something about the country. Can you use this combination of backgrounds?"

Q. Students at Fifth College are required to take a six-quarter course called "The Making of the Modern World." How has this survey course changed the way you view the world?

A. Well, it exposed me to a lot. MMW is very ambitious. In two years you study the history of everything — 5,000 years of world history. You even go back two million years studying the evolution of man. It provides a big, broad survey that exposed me to a lot of things I wouldn't otherwise have known much about. It gives you a huge background to draw upon.

Q. In addition to taking your studies very seriously, you also have a passion for sports — namely, rugby. What's your attraction to this sport in particular?

A. Rugby, of course, has this reputation of being a crazy, violent sport and although, in general, I'm not a crazy, violent kind-of guy, I do like tough sports. I don't think I could get into tennis. It has been a really good sport and I've met a lot of guys through it. There are a lot of rugby clubs out there whose idea of a practice is to put a keg on the sidelines, scrimmage, and have a drink whenever you get thirsty. But our practices are very serious and we're a very competitive team. According to one national rugby paper, we ranked fourth in Southern California.

In general, it's a very social sport. Last year the team went to the Bahamas and this year we're going to Jamaica. Mostly it was to take a four- or five-day weekend and get closer as a team. We have things like the rookie initiation, which is a way of bonding. The team is really tight.

Q. How do you cope with life's pressures?

A. Maybe it's an attitude that I've cultivated that if something isn't working out, I'm not going to worry about it. It will work out, so I just keep faith. It goes back to oriental philosophy: things happen as they happen. Don't invest your energy in trying to change something, when you should roll with the punches.

JESSICA LEUNG
REVELLE COLLEGE SENIOR

*J*essica Leung, twenty-two, broke a family tradition when she came to UCSD. Her parents, sister, and twin brothers all attended UC Berkeley. "I wanted to break off on my own," said Jessica. "I didn't want that element of living up to my siblings; it really wasn't my style."

Her style was more suited to carving out her own niche at UCSD. She has been a resident assistant, chairperson for the Revelle Programming Board, and a tutor to a local elementary school. She also enjoys playing intramural sports, such as volleyball, softball, flag football, and floor hockey.

Jessica changed her major several times before settling on communication. As a soon-to-be working professional, she would like to address the disparity of Asian roles in America's mainstream media. "I want to get involved in a position where I could possibly promote more Asian roles, and to be a part of the change that needs to take place." She credits her mentor, Vicente Rafael (associate professor of communication), for fostering her interest in the media.



Q. You've lived on campus your entire college career. Tell us more.

A. This is my fifth year on campus. I'd encourage everybody to live on campus at least one year, because you'll be living around people who are going through the same transition and becoming independent away from home. I think living on campus is a definite advantage because you have social support. It gives you insight into different kinds of people, different cultures, and the many variations we have as people.

It also gives you academic support and it gives you encouragement. I don't think people realize it at the time, but if you look back you'll see it's a definite advantage to live around other students.

Q. As a resident assistant (RA), what advice do you have for making the transition from living at home to living on campus?

A. Getting familiar with the campus is always a good way to feel comfortable. New students should read up on the apartments, visit the school, or speak with other residents. Walk into a dorm and say you're thinking about coming. I think it kind of puts you at ease if you can have someone answer your questions beforehand, rather than just coming in blind.

Also, think out your own goals. Incoming students should really think about what they want to do, about possible paths they want to pursue. I don't think I did that. I just came in ready to go to college. I think it would be good to set a goal as soon as possible, because then your whole college career just comes together. I think as soon as you set your goal, things feel more purposeful, more directed, and you feel more motivated.

Q. Does that hold true from your own experience?

A. Yes, definitely. I was undeclared for a year and a half. People were getting worried about me, and I was worried about myself. When I went into political science I was interested in it, but I knew I didn't have the drive. I saw a lot of people who really had a passion for it, but I knew I didn't.

I want to get involved in a position where I could possibly promote more Asian roles, and to be a part of the change that needs to take place.

Then I switched to cognitive science. At the time, it was a fairly new major and I was hearing a lot of great things about it. I enjoyed certain aspects of it, but then I realized that I wasn't computer literate to the point of being a programmer.

It was fall quarter of my fourth year when I started thinking that I didn't want to major in cognitive science anymore. I thought, "What am I thinking! I'm graduating in the spring." That's when I started thinking about what I really wanted to pursue, what I really wanted to accomplish in my life.

Over the years I've come to realize that I want to work with film or broadcasting, so I looked into the communication major and talked to a lot of academic advisers. The big thing that's come into my life over the last year is the disparity of Asian roles in the mainstream media — American media — and how lacking it is and the effects it has on our society. I want to get involved in a position where I could possibly promote more Asian roles, and to be a part of the change that needs to take place.

I talked to my parents because I knew it was going to take me another year. They were very supportive, and my father actually came around and said, "Why didn't you figure this out before?" He knew the other majors weren't fitting me well and that I should have gone for communication in the beginning.

That was a very good change because I was much happier and I really enjoyed my classes. Like I said earlier, I had a goal and I felt like I had a purpose. I had a drive and a motivation that pushed me and made me enjoy school more.

Q. What kind of interaction have you had with faculty?

A. Professor Vicente Rafael (associate professor of communication) made a big difference in my goals. I took his class on "Introduction to Communication and Culture," which deals with racial issues and diversity. I also took a seminar with him on Asian-Americans in literature and film. He spoke about Asian roles — the history, the prejudice, the discrimination, and the need for stereotypes to be reversed or broken down and for the truth to be told.

I spoke with him a lot outside the class about those issues. I told him I would like to pursue further education, possibly graduate school in communication, and he gave me a lot of pointers and tips. He's been a good influence in my career in the communication major.

Q. Having this type of interaction seemed to help you focus on your own goals.

A. I think that's a key. The professors here are great resources because they have so much experience. They know what routes to follow and what graduate schools are looking for. This quarter I have a class with Herb Schiller (professor emeritus of communication), who's widely known in the communications field. It's really great to listen to him. He and Rafael are the type of professors that really make the difference in a college education. Certain professors can really spark the interest, really get you thinking. Those are the professors people need to seek out. Definitely take advantage of them because they can make a big difference.



COURSES, CURRICULA, AND PROGRAMS OF INSTRUCTION

▼ 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 firms, business organizations, and numerous other fields. Students can also work with the internship office to set up their own placements.

Although most placements are in San Diego County, the AIP provides internships in Washington, D.C. and Sacramento with congressional and government offices, consumer interest groups, and media organizations. UC-sponsored 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 Washington, D.C., internship. 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.

▼ Afro-AMERICAN LITERATURE

See Literature.

▼ ANTHROPOLOGY

OFFICE: 8029 Humanities and Social Sciences Building, Muir College

Professors

F. G. Bailey, Ph.D.

Roy G. D'Andrade, Ph.D., *Chair*

David K. Jordan, 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.

Associate Professors

Guillermo Algaze, Ph.D.

Tanya M. Luhrmann, Ph.D.

Fitz John P. Poole, Ph.D.

Marcelo M. Suárez-Orozco, Ph.D.

Assistant Professors

Suzanne A. Brenner, Ph.D.

James Holston, Ph.D.

Thomas E. Levy, Ph.D.

James Moore, Ph.D.

Associated Faculty

Edwin L. Hutchins, Ph.D., *Associate Professor, Cognitive Science*

Martha Lampland, Ph.D., *Assistant Professor, Sociology*

Paula F. Levin, Ph.D., *Lecturer, Teacher Education Program*

Robert A. Nemiroff, M.D., *Clinical Professor of Psychiatry and Director of Resident Training*

Lawrence A. Palinkas, Ph.D., *Associate Professor, Community and Family Medicine*

Lola Romanucci-Ross, Ph.D., *Professor, Community and Family Medicine, UCSD School of Medicine*

Christena Turner, Ph.D., *Assistant Professor, Sociology*

Kathryn A. Woolard, Ph.D., *Associate Professor, Sociology*

Anthropology is a humanistic social science dedicated to understanding the worldwide diversity of social institutions and cultural traditions. Because there is increasing awareness of the importance of sociocultural factors in domestic and international relations, a bachelor's degree in anthropology has become accepted as a valuable preparation for careers in law, medicine, education, business, government, and various areas of

public service. Anthropology majors can qualify for a California teaching credential from UCSD through the Teacher Education Program. The department offers a full range of courses in cultural, social, psychological and biological anthropology, as well as archaeology. Courses include offerings which focus on specific societies or regions of the world as well as more topically 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 in 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 anticipate majoring in anthropology are particularly advised to take ANLD 22, which is the prerequisite for most upper-division cultural and psychological courses offered by the department.

Students who intend to major or minor in biological anthropology should take ANLD 10, 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 either general 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 department. 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, Muir, Third, Warren, or Fifth 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), one directed group study course (198), and a combination of one Internship Seminar (ANBI 187A,C and 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 is recommended as one way of fulfilling 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 cultural anthropology.
4. Five elective courses, three of which should be in archaeology, and the remaining two can be either from offerings in archaeology or in related disciplines. 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 anthropology department office.
3. Four four-unit courses in the Department of Biology. Courses which are applicable are 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.

(OPTIONAL) DEPARTMENTAL SENIOR THESIS PROGRAM

The senior thesis is prepared during three successive quarters of ANPR 196, Thesis Research (counted as part of the student's twelve required courses). 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 sole responsibility for the grades the student receives in the three quarters. The reading committee advises the faculty on the merit of the thesis for departmental honors. Students are invited into this program by approval of the anthropology faculty. Under normal circumstances eligibility for the program requires that the student (1) complete eight upper-division anthropology courses by the end of the junior year, three of which must be the "core" sequence, and (2) achieve grade-point averages of at least 3.6 (overall) and 3.6 (anthropology) by the end of the junior year. These requirements may be waived by vote of the

department faculty. Students who wish to be considered for invitation to the Senior Thesis Program should notify the department's undergraduate adviser by the second week of the spring quarter prior to advancement to senior standing.

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 in-ternship experience in (1) physical 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.

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

1. Specific Courses:

280A-B-C: Core Seminars (each 4 units)

281A-B: Introductory Seminar (each 1 unit)

283A: Fieldwork Seminar (4 units)

2. By university requirement at least thirty-six quarter-units are required for the master's degree. Students must take four, letter-grade elective anthropology courses from at least three different faculty members. Required specific courses may not be counted as electives.

3. The Master's Thesis

In the winter quarter of the second year, a master's thesis committee is appointed. The thesis is written in the winter quarter and submitted to the committee at the beginning of the spring quarter. Completion of the specific and elective courses, unanimous approval of the master's thesis by the student's committee, and acceptance by the university archivist at the end of the spring quarter represent the final steps in the completion of all requirements for the master of arts degree.

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.

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 planning fieldwork in a non-English-speaking area is required to 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.

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 pre-field 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. Fieldwork proposals do not normally exceed twenty double-spaced typed pages, plus abstracts.

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. An abstract of the student's dissertation must be in the hands of all faculty members ten days before the dissertation hearing. 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. 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.

Any decision to waive a requirement for either the master's degree or the Ph.D. must be made by the full faculty.

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.

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.

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.

THE MELANESIAN STUDIES RESOURCE CENTER AND ARCHIVE

These facilities embody the substantial interests in the Pacific Basin that are represented on the UCSD campus and the special prominence of the UCSD Department of Anthropology in the study of cultures and societies of Oceania and especially of Melanesia. In cooperation with the UCSD libraries, the Melanesian Studies Resource Center and Archive has two major projects. First, there is an ongoing effort to sustain a library collection of monographs, dissertations,

government documents, and journals on Melanesia that make UCSD the premier center for such materials in the United States. Second, there is an endeavor to collect the extremely valuable unpublished literature on Melanesia, to catalog such materials systematically, to produce topical bibliographies on these holdings, and to provide microfiche copies of archival papers to interested scholars and to the academic institutions of Melanesia. This innovative archival project is intended to be a model for establishing special collections on the traditional life of tribal peoples as dramatic social change overtakes them. In the near future, anthropological research on tribal peoples will take place largely in archives of this kind. These complementary collections will support a variety of research and teaching activities and are already attracting students of Melanesia to this campus. The Melanesian Studies Resource Center and Archive are directed by members of the Department of Anthropology faculty, in collaboration with the Central University Library.

Courses

NOTE: For specific course offerings, check the *Schedule of Classes* issued fall 1993, winter 1994, and spring 1994.

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)
After the end of the last glaciation some 12,000 years ago, some societies were forever changed with the emergence in short order of early agricultural villages and states. This course examines archaeological data for this transformation across the world.

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. (Prerequisite for most upper-division cultural and psychological anthropology courses.)

ANLD 23. Cultural Anthropology: Society (4)
A cross-cultural perspective on the means by which human activities are socially organized and coordinated. Topics include legitimacy, conflict, and strategizing.

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 196. Thesis Research (4)

Independent preparation of a senior thesis under the supervision of a faculty member. Students begin the three-quarter sequence in fall quarter. *Prerequisites: students will be admitted by invitation of the department. Department approval required.*

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 101. Human Social Behavior: The Evidence from Animals (4)

An overview of theories of animal social behavior with attention to new developments in primate behavior. Evaluation of current popular books on human behavior. *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.) 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 special extinctions on the biosphere and human welfare. *Prerequisites: ANLD 10 or consent of instructor and 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. *Prerequisites: ANLD 42. BIEB 164 recommended. Upper-division standing.*

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. The Issues of Consciousness in Animals and Humans (4)

Using a comparative perspective, the evidence from animal behavior raises interesting questions about what consciousness is, the uniqueness of human consciousness, and the characteristics that are a part of the animal-human continuum.

Course draws from various university faculty. *Prerequisites: ANLD 10 or introductory course in evolution/animal behavior or consent of instructor. Upper-division standing.*

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 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 (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. *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. *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 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

ANTHROPOLOGY

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 Hobsbawm, B. Anderson, Foucault, Said, Rogin, de Tocqueville, Jencks, A. Hirschman. *Prerequisite: major in anthropology or consent of instructor.*

ANGN 111. Anthropology of Folklore (4)

Review of Finnish-historical-geographical, classical functionalist, structuralist, and psychological approaches. Examined in context of analyzing specific folk narratives (myth, legend, and folktale), beliefs, proverbs, riddles, humor, and verbal duelling. Also folkloric issues surrounding ethnicity, power, gender, and world view. *Prerequisite: upper-division standing.*

ANGN 114. Family, Childhood, and Society (4)

A comparative and analytic study of the relationships between family structure and childhood experience and their effects on social and cultural systems. *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 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 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 129. Female, Male, and Gender: The Cultural Shape and Social Force of Sexual Difference (4)

Course explores how sexual differences are culturally constructed and how such gender constructs become socially significant in various domains of community life and psychologically significant in the formation of personal identity. Both anthropological and feminist studies are examined. *Prerequisite: upper-division standing.*

ANGN 133. 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 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 143. Education and Culture (4)

Introduction to anthropological study of education. Includes ethnography of schooling, social interaction in educational settings, language and education, ethnicity and education, psychocultural study of learning, culture and achievement, culture and cognition, and cross-cultural research in education. *Prerequisite: upper-division standing.*

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. *Prerequisites: upper-division standing.*

ANGN 164. The Psychoanalytic Study of Folklore (4)

This is an introductory course to the psychoanalytic study of folklore. It examines folklore materials, including myths, folktales, legends, games, humor, etc., in light of the Freudian contribution to the study of culture. *Prerequisite: ANGN 111.*

ANGN 165. Approaching the Sacred (4)

Course examines religion from an anthropological perspective, introducing the student first to examples of religious practice

and then to theories about the origin and function of religion. Readings include Freud, Weber, Durkheim, Frazer, and James and novels by Bernanos and Lagerkvist. *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 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). *Prerequisite: 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 100. Power and Resistance (4)

Course examines how power is constructed and contested. It studies cases of open resistance, such as social movements, and also those in which people subvert institutions, beliefs, and consumer images by appropriating them. Examples from Latin America and the United States. *Prerequisite: upper-division standing.*

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 102. Latin American Societies and Culture (4)

Anthropological overview of Latin American cultural ecology, history, ethnicity, economic and social organization, personality, gender, ethos and world view, symbolism, migration, the culture of terror, and current developments in the anthropology of the region. *Prerequisite: upper-division standing.*

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)

This course critically examines theories of modern and post-modern 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 125. Contemporary Central America (4)

Focus on anthropological contributions to the understanding of contemporary Central America—considers ecological influences, historical continuities and change, economic systems, personality, ethos, ethnicity, migration, the three R's (religion, reform, and revolution), culture of terror, and current developments in Central American anthropology. *Prerequisite: upper-division standing.*

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 145. Topics in Latin American Societies and Cultures (4)

Review of current social science research in Latin American studies. Themes will vary from year to year: class, gender, ethnicity, religion, etc. *Prerequisite: upper-division standing.*

ANRG 152. Gandhi: The Man and His Society (4)

This course uses Gandhi as a focus in exploring Indian culture, British colonialism, and moral commitment. Students will read Gandhi's writings and the work that deeply influenced Gandhi—Tolstoy, Ruskin, Thoreau, the *Bhagavad Gita*—in the effort to answer the question: what was Gandhi's "truth"? *Prerequisite: upper-division standing.*

ANRG 162. Peoples of the Near East (4)

An introduction to the social and political traditions of the tribal and peasant peoples of the Near 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 166. Family and Society in the Near East (4)

An introduction to the historical and sociological study of societies with Islamic traditions and a discussion of the social and political problems associated with such societies. *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 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.*

ANRG 189. Zionism (4)

This seminar examines the ideological and social bases of the Zionist idea and the role of the Zionist movement in the Jewish settlement of Palestine, the formation of the state of Israel, and Arab-Jewish relations. *Prerequisite: upper-division standing.*

ANTHROPOLOGY: GRADUATE

ANRG 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.*

ANRG 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.*

ANRG 203. Classics in African Ethnographies (4)

Classics in African ethnography are the core here with emphasis on both their descriptive and their 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.*

ANRG 210. Social Conflict and Democracy in Brazil (4)

This course examines the processes and dilemmas of democratization in urban Brazil. It develops a cross-class analysis of four historically related issues, focusing on both social practice and political institutions: social inequality, violence, legal pluralism, and new social movements. *Prerequisite: graduate standing or consent of instructor.*

ANRG 217. Current Theoretical Issues in Anthropology (4)

Discussion and evaluation of theoretical and methodological issues based on selected papers in the current anthropological and related literature. *Prerequisite: completion of first-year graduate program in anthropology.*

ANRG 218. Cognitive Anthropology (4)

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethno-science, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

ANRG 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.*

ANRG 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.)*

ANRG 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.*

ANRG 227. Contemporary Social Theory (4)

Course considers development of social theory since WWII, focusing on basic suppositions about the constitution of modern society and logic of social explanation. Evaluates importance of developing new social theory in anthropology and examines third-world challenges to Eurocentric theory. *Prerequisite: graduate standing.*

ANRG 229. Projective Techniques in Cross-Cultural Perspective: The T.A.T. in Fieldwork Studies (4)

A graduate-level introduction to the use of the Thematic Apperception Test in cross-cultural perspective. The course will cover methodological and theoretical issues in the use of projectives in the field. *Prerequisite: graduate standing.*

ANRG 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 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 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. Complementarity, it also examines how sociocultural theory has been appropriated in historical studies. *Prerequisite: graduate standing.*

ANGR 240. Morality and the Moral Order (4)

This course will examine anthropological, psychological, philosophical, and theological texts as the means to interpret the use of moral concepts within the ethnographic context. Authors and issues considered will include Durkheim, Weber, Freud, suffering, theodicy, and gender differences. *Prerequisite: graduate student in anthropology or consent of instructor.*

ANGR 244. Culture and Psychopathology (4)

The possible role of culture in forms of psychopathology described for other cultures as well as our own will be set against trends in bioneurological research of recent decades. Lines of theory and research bridging the two will be explored. *Prerequisite: course in psychological anthropology, such as ANPR 107 or ANGR 280C, or consent of instructor.*

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. *Prerequisite: 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 253. History of Anthropology (4)

A synoptic treatment of the intellectual currents affecting anthropology during its premodern period, between approximately 1880 and 1940. Coverage will include developments in American, British, and Continental traditions of the discipline. *Prerequisite: graduate standing.*

ANGR 256. Psychological Methods in Field Research (4)

Research dealing with the relation of cultures and psychology requires measures or methods of appraisal of psychological variables. We will survey ways in which such variables have been or might be implemented, anticipating needs and means of data analysis. *Prerequisite: second-year anthropology students.*

ANGR 258. Selected Topics in Psychoanalytic Theory (4)

A critical analysis of the psychoanalytic approach to selected topics in anthropology, such as religion, totemism, gender, so-

cial character, and symbolism. The topic for each seminar will be posted in advance. *Prerequisite: graduate standing.*

ANGR 261. Bibliographic Resources in Anthropology (0-1)

This course will acquaint students with a wide range of bibliographic sources useful in anthropological research. *Prerequisite: open to graduate students in anthropology and selected undergraduates.* (S/U and P/NP grades only.)

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. *Prerequisites: graduate standing in anthropology and consent of instructor.*

ANGR 275. Latin American Societies and Cultures: Reading the Classical Ethnographies (4)

A graduate-level introduction to the key ethnographies of Latin America. *Prerequisite: graduate standing.*

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 283B. Psychological Field Methods (4)

An introduction to a wide range of techniques including interview, observation, and testing leading to psychological inferences about groups and individuals in cross-cultural context. *Prerequisite: graduate standing in anthropology.*

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, Division of.

APPLIED OCEAN SCIENCE

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

ASSOCIATED FACULTY

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- Carl H. Gibson, Ph.D., AMES; SIO
- Robert T. Guza, Ph.D., SIO; CCS
- William S. Hodgkiss, 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
- Charles W. Van Atta, Ph.D., AMES; SIO
- Clinton D. Winant, Ph.D., SIO; CCS

Professors Emeritus

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 Fred N. Spiess, Ph.D., *SIO; MPL*
 Kenneth M. Watson, Ph.D., *SIO; MPL*

Associate Professor

John A. Hildebrand, Ph.D., *SIO; GRD; MPL*

Assistant Professors

James M. Ricles, Ph.D., *AMES*
 Bradley T. Werner, Ph.D., *SIO; CCS*

Lecturers

Fred H. Fisher, Ph.D., *ECE; MPL*
 Jules S. Jaffe, Ph.D., *SIO; MPL*
 Dick Seymour, Ph.D., *SIO; FOR*
 Spahr C. Webb, Ph.D., *SIO; MPL*

Associated Research Staff

Christian P. de Moustier, Ph.D., *SIO; MPL*
 Toyooki Nogami, Ph.D., *SIO; MRD*

Associated Research Groups

Marine Physical Laboratory, *MPL*
 Institute of Geophysics and Planetary Physics,
IGPP
 Center for Coastal Studies, *CCS*
 Climate Research Division, *CRD*
 Marine Archaeological Program, *MAP*
 Marine Research Division, *MRD*
 Foundation for Ocean Research, *FOR*
 Southwest Fisheries Center/NOAA, *SFC*
 Geological Research Division, *GRD*

THE GRADUATE PROGRAM

Applied Ocean Science (AOS) is an inter-departmental 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)**

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 spe-

cialization. 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.

**ARCHITECTURE,
SCHOOL OF**

ADMINISTRATIVE OFFICE: Building 409,
University Center

FACULTY

Founding faculty for the School of Architecture are listed below. Information about new faculty is available at the school's administrative office.

Professors

William Curtis, Ph.D.
 Craig Hodgetts, M.Arch.
 Adèle Naudé Santos, M.C.P., M.Arch. U.D., *Dean*

Associate Professors

Dana Cuff, Ph.D.
 Susan Ubbelohde, M.Arch.

Adjunct Professors

Edward Allen, M.Arch.
 Rob W. Quigley, B.Arch.

GENERAL

In 1988 the Board of Regents of the University of California established the School of Architecture at the San Diego campus. Adèle Naudé Santos, noted architect and educator, was appointed founding dean and her goal is to create a school and curriculum that will become a new model for architectural education. The school is intended to be experimental. Its search for the best teaching and learning format will be an evolving process in which the students will be fully engaged. Classes will be small, with a rich ratio of faculty to students.

The School of Architecture at UCSD is research based and inquiry in the fullest sense is at the center, not the periphery, of the school's activities. Having the research component at the very center of the school provides a unique impetus to the curriculum that is not found in other architecture schools. The ongoing research, and the students' participation in it, will provide continual examination of the curriculum and help to keep it focussed on current and emerging issues.

The school's teaching programs include broad preprofessional undergraduate education and professional training at the master's level. The school began admitting students to the master's program in the fall of 1992, and the other programs will be introduced later.

THE UNDERGRADUATE PROGRAM

The School of Architecture will offer an array of courses to provide an introduction to the field of architecture, to satisfy general-education requirements, and to complete a program leading to a bachelor of arts degree in architecture.

The B.A. degree program will be open to students in all UCSD undergraduate colleges. The major will be appropriate for undergraduates interested in a challenging program that uses art, engineering, history, and social science in the study of the design of our physical environment. It will constitute excellent preprofessional training for students interested in careers in architecture, urban planning, and related fields. Because the program will lead to a nonprofessional, unaccredited degree, it will emphasize the artistic, humanistic, and scientific foundations of the field. At the same time, it will provide sufficient grounding in the technical aspects of the field to enable a student to enter a professional graduate program.

At this time, the school offers three lower-division and three upper-division courses. In addition, the architecture faculty are developing more general courses to form the specific program for the bachelor's degree. Please contact the school for current information about the undergraduate program.

THE GRADUATE PROGRAM

The UCSD School of Architecture intends to offer three master's programs: master of architecture I, master of architecture II, and master of science. As indicated above, the school is research based and this will be apparent in the curriculum and the ongoing research into the design of new prototypes and processes at multiple scales. Problem sets explored in the studio will not be simply exercises, but part of larger research endeavors where critical issues of our era will be explored in depth.

When existing schools of architecture are examined, it is clear that there is no school quite like the one being developed at UCSD: a graduate professional school of architectural studies with a strong research base, focussing on global issues, combining theory and practice. The UCSD campus provides the opportunity for inno-

vative development in professional training without the weight of traditional modes designed for other purposes and conceptions.

The final array of course offerings and program descriptions are currently in preparation. The program descriptions below may be useful to prospective students generally exploring architecture schools, but current and complete information should be sought from the School of Architecture for full consideration of the programs.

MASTER OF ARCHITECTURE I

The M.Arch. I is a first professional degree program, for students already holding a B.A. or B.S. degree. Although the program has some unique philosophical and structural features, it includes course work in the traditional categories of architectural training. The program of study requires ten quarters of course work in residence plus one summer design-build practicum. Students will progress through studios, lectures, and seminars dealing with increasingly complex issues. The first five quarters are highly structured, with the five-quarter sequence, Architectural Design: Theories and Principles, a uniquely integrated studio/seminar course, at the core. Beginning in the sixth quarter, students participate in research projects, electives, and more traditional design studios. The master of architecture I degree will be awarded upon successful completion of the studio and course work, including a final research project in design.

MASTER OF ARCHITECTURE II

The M.Arch. II is a second postprofessional degree program aimed at students already holding a professional degree in architecture. The purpose of the course of study will be to extend the students' knowledge beyond the traditional boundaries of architecture. The course content will be research oriented, and studios will focus on topics related to the ongoing research agendas in the school. Four quarters of study is required for the M.Arch. II degree. The Design Studio constitutes half of the required units and one of the studios will be involved directly with the school's research center. In the fourth quarter a research paper on a topic of choice dealing with urban futures will be required as the culmination of the course of study.

MASTER OF SCIENCE IN ARCHITECTURE

The master of science in architecture program is a non-studio-based degree intended for students already holding a professional degree in architecture, or an architectural license, who

wish to advance their understanding of or expertise in some particular aspect of the field. The program of study for the M.S. requires three quarters of course work in which students will choose an area of specialization and work with a faculty adviser to shape a program of seminars and lecture courses. A thesis resulting from independent research on a topic of choice within the area of specialization is required for graduation.

Courses

LOWER DIVISION

10. Modern Architecture since 1900 (4)

This course will concentrate on architecture and urbanism in this century, emphasizing the notion of modern tradition. Examples will be drawn from Latin America, Asia, etc., as well as Western Europe and the United States. Close analysis of individual architects and buildings will be complemented by a study of general scenes to do with industrialization, new building types, cultural and political change.

11. Urban History (4)

An exploration of developments in urban history using a topical approach. Among the issues to be analyzed are the street, urban imagery, the skyline, maintenance of urban forms, districts, scenographic effects, urban edges, social conditions, landscaping, the impact of technology, and experiential choreography.

12. The Place of Architecture, the Architecture of Place (4)

This course provides a historical survey of architecture and urbanism in the United States from about 1000 A.D. to the present. Its preeminent subject will be architecture, but architecture considered in relation to urban context. The course interprets the concept "urban" broadly, to include settlement, village, town, city, suburbia, megalopolis, and utopia. We will, therefore, study buildings as they contribute to the formation of community identity and as they express cultural values—whether communal or personal—as well as geographic, economic, material, and social conditions.

UPPER DIVISION

101. The City Street (4)

This course will explore the interdisciplinary nature of the street and investigate the move from the relatively stable physical form of the street throughout European history until a series of technological advances in the nineteenth century overthrew all previous limitations on the form—and therefore the essential character—of the street. Students will examine the consequences of these new techniques in the architecture of the modern street, and their incorporation in both conservative and radical schemes for restructuring the city.

102. The Form of Design: Image, Creation, and Practice (4)

Our physical surroundings are shaped by design, from light-bulbs 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 exploration.

103. 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.

GRADUATE

220. Architecture Practice (3)

This seminar investigates the architect in society: theoretical, historical and contemporary perspectives upon the architect's fundamental tasks. Getting work, moving it ahead, working with clients, establishing practice, project organization, as well as ethical issues of practice and critical evaluation of the profession's evolution aid in understanding contemporary dilemmas. *Prerequisite: consent of instructor.*

221. Urban Futures (4)

Trends affecting form of our built environment, presented by core faculty and visitors. Trends include information technology, demographics, and environmental concerns. Students will research a chosen topic and present a research paper as culmination of the M.Arch. II program. *Prerequisite: consent of instructor.*

225. Politics, Ideology, and Design (2)

Design conception and execution are intricately entwined with political and cultural contexts. This course considers the role of ideological premises in an architectural project's evolution. The growing significance of community activism, regulations, and environmental protection will be examined as they affect the shape of the built environment. *Prerequisite: consent of instructor.*

226. Learning from the Third World (2)

Affordable housing strategies have been developed and tested in developing countries over the last few decades. This course will examine the process by which housing is created and the resultant housing environments. Using examples primarily from Africa and South America, students will evaluate the extent to which the various approaches are adaptable to our local housing needs. *Prerequisite: consent of instructor.*

227. Transformations of Modernism (2)

This seminar will begin with a series of case studies and reflections on the methods, aims, and conventions of architectural criticism. It will allow the opportunity to reflect upon recent developments while also constructing frameworks for evaluation. Extremely close readings of individual works may be combined with a species of cultural criticism. Throughout, considerable emphasis will be placed upon the way that myths, meanings, and ideas are structured in architectural form. *Prerequisite: consent of instructor.*

228. Experience and the City: Mapping the Subjective (2)

This seminar will provide both a theoretical overview and an opportunity to explore the subjective dimensions of the urban experience. Lectures and discussions, drawing on a broad range of historical and contemporary sources, including fiction, poetry, journalism, film, photographs, and other urban representations will propose a methodology of urban experience. Using these techniques, students will then carry out their own investigations, focusing on contemporary American cities. *Prerequisite: consent of instructor.*

229. Computer Imaging (2)

An examination and practicum in computer imaging for architects. The course will explore the graphic manipulation possi-

bilities presented by output from 3-D software packages when used as input for image manipulation packages. Advanced software and hardware capabilities for input and output processes in representation of architectural documents will be introduced and explored, including texture, rendering, animation, and photomontage. *Prerequisite: consent of instructor.*

401. Architectural Design: Theories and Principles 1 (12)

The fundamental principles and primary elements employed in architectural design are introduced. Particular emphasis is placed on social and ecological issues. History, theories of architecture will deal with universal questions and general principles and the basic elements of visual language. The impact of technology on design in its various aspects will be introduced conceptually. *Prerequisite: consent of instructor.*

402. Architectural Design: Theories and Principles 2 (12)

Design problems will increase in programmatic and contextual complexity. The sociocultural and behavioral aspects of architectural design will be underlined. History and theory of architecture will emphasize the expression and articulation of ideas. Technology will focus on building construction and simple materials and methods. Introduction of simple computer imaging. *Prerequisite: consent of instructor.*

403. Architectural Design: Theories and Principles 3 (12)

Design problems will be assigned of greater spatial and technological complexity. Development of a design methodology stressed. Issues of structure as a determinant and effect of the building's microclimate on design. The analysis of an architectural significant individual building will train students to do visual, experimental, and conceptual analysis. *Prerequisite: consent of instructor.*

406. Design-Build Practicum (6)

Students design and participate in building a small project. Most often, the project is to be built in another country to understand site-specific issues: culture, environment, indigenous building materials, codes, etc. *Prerequisite: consent of instructor.*

425. Technological Strategies (2)

The cost of housing is inextricably tied to technology. The creation of affordable housing will need new technological strategies. New materials and methods of construction as well as traditional ways of building will be examined, related to cost. Students will design simple house prototypes using a variety of technologies to test the constraints of the systems on design. *Prerequisite: consent of instructor.*

460. Research Proposal (2)

In preparation for Research Projects in Design, students will select topic, undertake basic research, analysis and programming, and prepare design brief for final project. Required for M.Arch. I students at the end of their third year. *Prerequisite: consent of instructor.*

461. Research Project in Design (9)

Individually selected research project undertaken by each student as a culmination of M.Arch. I program, demonstrating the breadth of knowledge gained during three-year program. Students emphasize particular area of interest or expertise. *Prerequisite: consent of instructor.*

462. Research Center Project (6)

Students will be actively engaged in ongoing work of the Architecture Research Center. Research agendas, varying year to year, include housing, energy, water conservation/reclamation/desalination. M.Arch. I students may be invited to participate in Research Center instead of Design Studio for one quarter in third year. One quarter of study in Research Center is required of all M.Arch. II students. *Prerequisite: consent of instructor.*

480. Design Studio (6)

Within design studio setting, students research and analyze environmental problems, and present three-dimensional solutions. Problems posed by faculty aim to challenge conventional thinking about architecture and urban design. Students choose from at least two design studio topics per quarter. *Prerequisite: consent of instructor.*

BIOCHEMISTRY

There is no department of biochemistry at UCSD. There is an undergraduate major in biochemistry and cell biology offered by the Department of Biology and an undergraduate major in chemistry/biochemistry offered by the Department of Chemistry; these majors are described in the biology and chemistry sections of this catalog.

Both the Department of Biology and the Department of Chemistry offer graduate programs with specialization in biochemistry. Those programs are described in the biology and chemistry sections of this catalog.

BIOLOGY

STUDENT AFFAIRS OFFICE

1128 Sciences Building
(619) 534-2786 (undergraduate)
(619) 534-3835 (graduate)

FINANCIAL AND ADMINISTRATIVE OFFICES

2130 Bonner Hall, Revelle College

Professors

Darwin K. Berg, Ph.D.
Jack W. Bradbury, Ph.D.
Stuart Brody, Ph.D.
Ted J. Case, Ph.D., *Chair*
Maarten J. Chrispeels, Ph.D.
Russell F. Doolittle, Ph.D.
Richard W. Dutton, Ph.D.
Richard A. Firtel, Ph.D.
Morris E. Friedkin, Ph.D., *Emeritus*
E. Peter Geiduschek, Ph.D.
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.
Donald R. Helinski, Ph.D.
John J. Holland, Ph.D., *Emeritus*
William B. Kristan, Jr., Ph.D.
Michael Levine, Ph.D.

Dan L. Lindsley, Ph.D., *Emeritus*
 William F. Loomis, Jr., Ph.D.
 William D. McElroy, Ph.D., *Emeritus*
 Stanley E. Mills, Ph.D., *Emeritus*
 Maurice Montal, M.D., Ph.D.
 John W. Newport, Ph.D.
 Xuong Nguyen-Huu, Ph.D.
 Paul A. Price, Ph.D.
 Milton H. Saier, Ph.D.
 Paul D. Saltman, Ph.D.
 Immo Scheffler, Ph.D.
 Terrence J. Sejnowski, Ph.D.
 Allen I. Selverston, Ph.D.
 S. Jonathan Singer, Ph.D.
 Douglas W. Smith, Ph.D.
 Deborah H. Spector, Ph.D.
 Nicholas C. Spitzer, Ph.D.
 Herbert Stern, Ph.D., *Emeritus*
 Susan L. Swain, Ph.D., *in-residence*
 Suresh Subramani, Ph.D.
 Kiyoteru Tokuyasu, Ph.D., *Emeritus*
 Silvio S. Varon, M.D.
 Sandra L. Vehrencamp, Ph.D.
 Christopher J. Wills, Ph.D.
 David S. Woodruff, Ph.D.
 Juan Yguerabide, Ph.D.

Associate Professors

Willie C. Brown, Ph.D.
 Douglass J. Forbes, Ph.D.
 P.A.G. Fortes, M.D., Ph.D.
 James T. Kadonaga, Ph.D.
 Muriel N. Nesbitt, Ph.D.
 Ramon Piñon, Ph.D.
 James W. Posakony, Ph.D.
 Trevor D. Price, Ph.D.
 Percy J. Russell, Ph.D., *Emeritus*
 Jean Y. J. Wang, Ph.D.
 Michael P. Yaffe, Ph.D.
 Charles G. Zuker, Ph.D.

Assistant Professors

Ethan Bier, Ph.D.
 Nigel M. Crawford, Ph.D.
 Christine E. Holt, Ph.D.
 Joshua R. Kohn, Ph.D.
 Vivek Malhotra, Ph.D.
 Cornelis Murre, Ph.D.
 Robert J. Schmidt, Ph.D.
 Julian I. Schroeder, Ph.D.
 Martin F. Yanofsky, Ph.D.

Adjunct Professors

Suzanne Bourgeois, Ph.D.
 Melvin Cohn, Ph.D.
 Walter Eckhart, Ph.D.
 Glen Evans, Ph.D.
 Ronald M. Evans, Ph.D.
 Daniel Goodman, Ph.D.
 Meredith Gould, Ph.D.

Martin Haas, Ph.D.
 Yasuo Hotta, Ph.D., *Research Biologist—
Emeritus*
 Frank M. Huennekens, Ph.D.
 Anthony R. Hunter, Ph.D.
 Norman R. Klinman, Ph.D.
 Christopher J. Lamb, Ph.D.
 Simon LeVay, Ph.D.
 Oliver A. Ryder, Ph.D.
 Bartholomew M. Sefton, Ph.D.
 Jonathan Sprent, 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 about the different levels of biological organization—biochemical, cellular, physiological, and ecological. The research and the teaching of the department emphasize the fundamentally important processes that occur at each of these levels. On such a solid foundation, 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 Sciences Building, administers the undergraduate biology program for all five colleges. For complete details regarding policies and procedures pertaining to the biology programs, please contact the Biology Student Affairs Office.

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. The six biology majors are not impacted, but classroom availability may sometimes limit initial enrollment. The Department of Biology and the UCSD administration are making every effort to meet student needs for all required courses. For this reason, it is recommended that students take as many available required courses as possible when the courses are offered.

To officially declare one of the six biology majors, submit a completed Change of Major form and a copy of your latest UCSD transcript to the Department of Biology's Student Affairs Office (1128 Sciences Building).

**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 Opportunities 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 Biology 195, 196, or 199.**

STUDENTS WITH TRANSFER CREDIT

Courses (including prerequisites) from other institutions must be reviewed by the Department of Biology before they will be applied toward any major requirement. Upper-division transfer work (with the exception of organic chemistry) also requires a General Petition in order to be considered for satisfaction of a major requirement. Contact the Student Affairs Office (1128 Sciences Building) 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 so 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 biology department chair, they are forwarded to your college's academic advising office for additional signatures. Your copy can be obtained from that office. For details concerning petitions, please contact the Student Affairs Office (1128 Sciences Building).

EAP COURSES (EDUCATION ABROAD PROGRAM)

It is very important that students who plan to participate in the Education Abroad Program or the Tropical Biology Program in Costa Rica contact an adviser in the Biology Student Affairs Office in order to obtain pertinent information and referral to a faculty adviser to discuss the proposed program of study. For most study abroad 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 Sciences Building.

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.

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 2.5. Students may select for their instructor any professor at UCSD, but the BISP 199 application must be submitted for department approval to the Department of Biology. The deadline to apply for BISP 199 is the eighth week of the quarter prior to the quarter 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 when their 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 appropriateness to 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 2A, B, C

Chemistry 6A, B, C, (or 7A, B) **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 four-unit 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 four-unit upper-division courses 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 recom-

mended 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, endocrinology, reproduction, marine biology, or ethology. 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 2A, B, C
Chemistry 6A, B, C, (or 7A, B) **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 sub-cellular 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 four-unit upper-division courses 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 four 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 2A, B, C
Chemistry 6A, B, C, (or 7A, B) **and** one lab
Physics 1A, B, C or 2A, B, C **and** one lab
(Mathematics 2A, B, C and Physics 2A, B, C are recommended)

UPPER-DIVISION REQUIREMENTS

1. Organic Chemistry (Chemistry 140A-B)

2. One chemistry laboratory: Organic Chemistry (Chemistry 143A) or Physical Chemistry (Chemistry 105A)

3. Structural Biochemistry (BIBC 100)

4. Metabolic Biochemistry (BIBC 102)

5. Biochemical Techniques (BIBC 103)

6. Physical Biochemistry (BIBC 110)

7. Molecular Biology (BIMM 100)

8. Cell Biology (BICD 110)

9. Genetics (BICD 100)

10. One four-unit 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.

11. Four additional four-unit upper-division courses 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 2A, B, C
Chemistry 6A, B, C (or 7A, B) **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 four-unit upper-division courses 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 require-

ment. (Subsequent quarters if 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 2A, B, C
Chemistry 6A, B, C, (or 7A, B) **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 I (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. Animal Virology (BIMM 114)
11. Medical Microbiology (BIMM 124)
12. Three additional four-unit upper-division courses 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 animals in relation to each other and to their environments. Research careers in ecology, behavior, and evolution can range from tropical community ecology studies through work on animal communication signals to the design and maintenance of ecological preserves. 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, 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. 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. (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 2A, 2B, and 2C are

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strongly recommended, but Mathematics 1A, 1B, and 1C are acceptable.

Chemistry: Chemistry 6A, 6B, and 6C OR Chemistry 7A and 7B. 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 and behavior and should be taken no later than the beginning of the 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 four-unit 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, 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 during some years. For that reason it is recommended that students take as many required courses as possible *when the courses are offered*.
5. Four additional four-unit upper-division courses 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; Math. 111A-B-C, 180A-B-C, and 181A-B-C; Anthropology 101, 110, 113, and 161; and Earth Sciences 101. 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 is the field course 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 completed during each of the final three academic quarters of the student's senior year. One of these quarters of BISP 196 may be taken in the summer preceding the senior year.) 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 Department of Biology Special Studies application form (may be obtained in the biology department's Student Affairs Office, 1128 Sciences Building). The form should contain the research proposal.
3. The application form should then be submitted to the biology department's Student Affairs Office. The deadline for submitting this form is the end of the eighth week of the fourth quarter prior to graduation.
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 given a department stamp for enrollment in 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 of 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 plus an oral presentation in the middle of the quarter to a group of students plus some faculty, 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 depart-

* (In the context of this program, "senior year" refers to the final three quarters of undergraduate enrollment, and "junior year" refers to the three quarters prior to the "senior year." The minimum residency requirement for enrollment in the program is six contiguous academic quarters as an ENROLLED UCSD student prior to the receipt of the B.S. degree.)

ment for admission to the program. (Contact the Department of Biology's Student Affairs Office.)

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 or higher 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 (BIGR 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 letter grade only. The student must confirm that the selected faculty adviser will not be on 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 1994	November 1993
Winter 1995	January 1994
Spring 1995	August 1994

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, BIGR 271, for each, and every, quarter of participation in the B.S./M.S. program. During the eighth week of the quarter in which BIGR 271 will be taken, the student needs to pick up an Add/Drop card at Biology Student Affairs Office (1128 Sciences Bldg.). At that time, the student's GPA will be verified and the appropriate course code assigned.

Research work (BIGR 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 (BIGR 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 (BIGR 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 [BIGR 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 (BIGR 271) during each of the three quarters of the subsequent graduate year.

c. Completion of four units of teaching (BIGR 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. (BIGR 271 or 297 **MAY NOT** be used to satisfy this requirement. BIGR 297 is intended for doctoral students **only** and B.S./M.S. students may not enroll in this course.)

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). Students are to select the committee during the first quarter of the graduate year and are to submit the appropriate paperwork to the biology graduate coordinator, during that quarter. The student must arrange a meeting of his or her committee to discuss the proposed research during this first graduate quarter.

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 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, population biology 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 graduate committee 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, molecular biology, cell biology, virology, and immunology. The only other general course requirement for the Ph.D. is a minimum of sixteen units of BGR 500 (Apprentice Teaching in Biology). Graduate students are required to participate in undergraduate teaching under the supervision of the responsible faculty member 50 percent of the time for one quarter in each year of graduate study following the first year. 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 Bulletin of the Graduate Division of San Diego State University. 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 Services Office (1128 Sciences Building, (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 1993-94 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 wait-list 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 prokaryotic and eukaryotic organisms, and to the elements of molecular biology. Three hours of lecture and one hour of recitation. *Prerequisites: two quarters of general chemistry; the 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.* (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.) (F,S)

BILD 12. Neurobiology and Behavior (4)

An introduction to the organization and functions of the nervous system; topics include molecular, cellular, developmental, systems, and behavioral neurobiology. Three hours of lecture and one hour of discussion. This course is designed for non-biology students and does not satisfy a lower-division requirement for any biology major. *Prerequisite: BILD 1, 2, 3, 10, 24, 26, 30, 32, or any equivalent.* (W)

BILD 14. Introduction to Plant Biology (4)

An introduction to plant biology and agricultural crop production. Topics include plants as our major food source, plant growth and development, the soil ecosystem, pest and pathogens, evolution of crop plants, plant breeding, plant genetic engineering, and other trends in 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.* (W)

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.* (Not offered in 1993-94.)

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.* (F)

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 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.* (S)

BILD 90. Undergraduate Seminar (1)

This seminar will be restricted to lower-division undergraduate students (freshmen and sophomores). The course will introduce current biological topics. The topics will vary with instructors and for each quarter. Examples of topics which may be discussed are: wildlife conservation, signalling within and be-

tween cells, mapping the human genome, etc. **This course will not satisfy any requirement for the biology major, biology minor, or college general-education.** (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 will be emphasized. Plants to be studied include a variety of fruit trees, bushes, and vegetables. Emphasis will be on propagation and culture conditions. Each student will choose a principal project and area of study. One hour lecture and fourteen hours 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 polysaccharides; 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,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 (4)

A laboratory-lecture course in the application of biochemical methods to biological problems. Two hours of lecture per week during first five weeks only (ten hours altogether during the quarter) and ten hours of laboratory. *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 would be 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, sedimentation, 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.* (W)

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 will learn the FORTRAN computer language and will run their programs at the Computer Center. There will be 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. 1A, B, C or*

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equivalent. (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.* (W)

BIBC 120. Nutrition (4)

Emphasis is on the biochemical aspects of nutrition. The known functions of vitamins, minerals, fats, carbohydrates, and protein will be 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.* (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 will be 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 1993-94.)

■ 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 will require 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 1993-94.) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be 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.* (W,S)

BICD 111. Cell Biology Laboratory (4)

A laboratory course in the application of cellular techniques to biological problems. Ten hours of laboratory. *Prerequisite: con-*

sent 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 would be 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 will be 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 (4)

Techniques in plant cell and tissue culture, plant transformation, genetic selection and screening of mutants, host pathogen interactions, gene regulation, organelle isolation, membrane transport. Ten hours of laboratory. *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 from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

BICD 130. Embryos, Genes, and Development (4)

Explores the developmental biology of animals at the tissue, cellular, and molecular levels. Basic processes of embryogenesis in a variety of invertebrate and vertebrate organisms are considered. Cellular and molecular mechanisms that underlie cell fate determination and cell differentiation are examined in detail. More advanced topics such as pattern formation and sex determination are discussed. This course is open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: BIMM 100, BICD 100.* (W)

BICD 131. Embryology Laboratory (4)

Descriptive and experimental embryology of marine organisms and of vertebrates. One and one-half hours of lecture and eight hours of laboratory. *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 would be the student's responsibility to officially drop the course at the Registrar's Office.

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 140. Immunology (4)

This course will cover 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.* (W)

BICD 142. Topics in Immunology (4)

This course will cover selected topics in molecular and cellular immunology at a more advanced level, and is a sequel to Im-

munology (BICD 140). *Prerequisites: BICD 140 and upper-division standing.* (S)

BICD 150. Endocrinology (4)

Topics will be 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.* (W)

■ ECOLOGY, BEHAVIOR, AND EVOLUTION

BIEB 100. Biometry (4)

This course will provide an introduction to the use of statistics in biological problems. Topics to be covered will include parametric statistics (t-tests, correlation, regression, ANOVA), non-parametric statistics, and experimental design. Students will be introduced to statistical software on the Macintosh computer. Three hours of lecture and two hours of section. *Prerequisite: BILD 3.* (F)

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 (4)

A laboratory course to familiarize students with ecological problem solving and methods. Some sections will use the Macintosh computer lab; others will be outdoors. One hour of lecture and eight hours of lab. *Prerequisites: BIEB 100 and 120 (may be taken concurrently).* (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.* (F)

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 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 will be 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.* (Not offered in 1993-94.)

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.* (Not offered in 1993-94.)

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.* (W)

BIEB 165. Sociobiology Laboratory (4)

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 lab. *Prerequisites: BIEB 100 and BIEB 164. (BIEB 164 may be taken concurrently.)* (W)

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.* (S)

BIEB 167. Animal Communication Laboratory (4)

Laboratory exercises will introduce students to quantitative methods of visual, auditory, and olfactory signal analysis and to lab and field studies of animal signalling. One hour of lecture and eight hours of lab. *Prerequisites: BIEB 100 and BIEB 166. (BIEB 166 may be taken concurrently.)* (Not offered in 1993-94.)

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. *Prerequisite: BILD 3.* (S)

BIEB 179. Conservation Biology Laboratory (4)

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.) (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 prokaryotes, but with discussion of eukaryotes. 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.) (FS)

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 would be 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 would be 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 will emphasize 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 will explore problems in the regulation of gene activity in eucaryotic cells approached at the molecular level. The course will include 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 will be 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 prokaryotic 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 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 instructors.* (W) Attendance at the first lecture/lab is required.

Nonattendance will result in the student's being dropped from the course roster. It would be the student's responsibility to officially drop the course at the Registrar's Office.

BIMM 122. Microbial Genetics (4)

Organization and function of prokaryotic genetic systems including sex factors, transduction, transformation, phage genetics, transposons, genetic engineering. Three hours of lecture. *Prerequisites: BIMM 100, BICD 100, and consent of instructors.* (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 will be 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.* (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 1 (4)**

Lecture course covering nervous, endocrine, muscular, cardiovascular, and excretory systems. Course emphasizes the control of systems and their interactions. Three hours of lecture and one hour of discussion. This course will be restricted to upper-division students. *Prerequisites: BILD 1, 2 and BIBC 100 or 102.* (W)

BIPN 102. Mammalian Physiology 2 (4)

Lecture course covering respiratory, reproductive, and gastrointestinal systems. Emphasis is placed on interactions of organ systems for the regulation of body functions. Three hours of lecture and one hour of section per week. This course will be restricted to upper-division students. *Prerequisite: BIPN 100 or consent of instructor.* (S)

BIPN 105. Animal Physiology Lab (4)

Experiments will be 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.) One hour of lecture and nine hours of laboratory. (W) Attendance at the first lecture/lab is required. Non-attendance will result in the student's being dropped from the course roster. It would be 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 or Chem. 7A-B.* (W)

BIPN 140. Cellular Neurobiology (4)

This course will cover the biophysics of the resting and active membranes of nerve cells. It will cover 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)

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BIPN 142. Systems Neurobiology (4)

This course will cover 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 (4)

Current electrophysiological techniques used to study nervous systems will be taught through exercises and individual projects. One hour of lecture and ten hours of laboratory. *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 would be the student's responsibility to officially drop the course at the Registrar's Office.

■ **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 will be assigned one class section and will meet one time per week with the section. A student will also be required to attend the lecture in the course and to meet at least one time per week with the instructor of the course. 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. No requests to be a teaching assistant will be accepted after that date.* (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. No BISP 199 application forms will be accepted after that date.* (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.**

BIGR 200. Seminar in Biology (1)

Invited speakers from the U.S. and abroad, who are leaders in various aspects of biological research, will describe their current research. *Prerequisite: graduate standing.* (S/U grades only.) (F,W,S)

BIGR 201. Seminar in Genetics (1)

Different restricted aspects of genetics will be discussed in detail each quarter; students will participate in the presentation of material, student presentations being prepared in consultation with the responsible faculty member. *Prerequisite: consent of instructor.* (S/U grades permitted.) (F,W,S)

BIGR 202. Seminar in Developmental Biology (1)

Seminars presented by graduate students to explore topics in specialized areas of developmental biology and to provide opportunities for students to gain experience in the organization, critical evaluation, and oral presentation of information from the literature. *Prerequisite: consent of instructor.* (S/U grades permitted.) (Quarter offered is variable, and course is not offered every year.)

BIGR 203. Seminar in Immunology (1)

The course involves weekly seminars given by faculty, post-doctoral research fellows, and advanced graduate students concerning current research in immunology and immunochemistry. One hour of lecture. *Prerequisite: consent of instructor.* (S/U grades only.) (F,W,S)

BIGR 204. Topics in Community and Population Ecology (3)

Each quarter this course will treat a different topic on the theoretical or conceptual side of community and population ecology. Students will read materials in depth, will attend weekly discussions, and will explore theories and models with statistical, analytical, and algorithmic tools of the trade. Open to qualified undergraduates with consent of instructor. (S/U grades only.) (Quarter offered is variable, and course is not offered every year.)

BIGR 205. Seminar in Microbial Physiology (1)

Weekly seminars and discussions led by faculty, postdoctoral fellows, and graduate students concerning recent research in the areas of structure and function of microbial cell surfaces and morphogenesis in microorganisms. *Prerequisite: consent of instructor.* (S/U grades permitted.) (S)

BIGR 206. Topics in Biophysics and Physical Biochemistry (4)

(Same as Physics 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.* (S/U grades permitted.) (W)

BIGR 207. Seminar Topics in Molecular Biology (1)

Weekly presentation of recent research and developments in molecular biology by faculty, research fellows, graduate students, and visitors. *Prerequisite: graduate standing.* (S/U grades only.) (F,W,S)

BIGR 208. Genetics Journal Club (1)

Presentation in historical perspective of current papers of their own choice from the literature of genetics (broadly interpreted) by the participants; presentation of at least one paper required. *Prerequisites: graduate standing and admission to doctoral research or consent of instructor.* (S/U grades only.) (F,W,S)

BIGR 209. Seminar in Cell Biology (1)

Students and faculty with an interest in cell biology will meet one hour each week to present and discuss current topics in the field. Each student will be responsible for a half-hour pre-

sentation. Open only to biology graduate students. (S/U grades only.) (F,W,S)

BIGR 211. Special Topics in Genetics (3)

Provides in-depth coverage of broad topics in the area of genetics. Topics covered in recent years include chromosome behavior, chromosome organization, developmental genetics, and human genetics. Designed for graduate students but open to qualified undergraduates. *Prerequisite: BICD 100.* (S/U grades only.) (Quarter variable and not offered every year.)

BIGR 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.) This course will not be offered this year.

BIGR 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)

BIGR 214. Workshop in Behavioral Ecology (3)

Hands-on experience in the analysis, modelling, and testing of hypotheses 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. Open to qualified undergraduates and graduate students with consent of instructors. (S/U grades only.) (F)

BIGR 221A. Advanced Genetics (3)

Provides a broad, advanced-level coverage of molecular and formal aspects of genetics for first-year graduate students. Topics covered include bacterial genetics, recombination in prokaryotes and eucaryotes, mammalian somatic-cell genetics, developmental genetics, sex determination, dosage compensation, immunogenetics, etc. Eight hours of lecture-discussion. *Prerequisites: BIBC 102, BICD 100, and BIMM 100 or the equivalent.* (Letter grades only.) (F)

BIGR 221B. Advanced Cell Biology (4)

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; structure and function of integral membrane proteins involved in transport, ion pumps, voltage and ligand controlled ion gates, transmembrane signaling; receptor mediated endocytosis; protein synthesis and protein targeting; the role of RER and Golgi apparatus; the biosynthesis of mitochondria, lysosomes, and other intracellular organelles in animal and plant cells; the cytoskeleton and the role of its components in cell structure, motility, cell-cell interactions, and mitosis; the control of cell division (the cell cycle). Ten hours of lecture and one hour discussion of recent papers complementing the lectures. *Prerequisites: BIBC 102, BICD 100, 110, AND BIMM 100 or the equivalent.* (Letter grades only.) (F)

BIGR 222. Advanced Molecular Biology (6)

Provides a broad, advanced-level coverage of modern molecular biology for first-year graduate students. Topics include prokaryotic and eucaryotic 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.) (W)

BIGR 223A. Protein Biochemistry (1)

Topics include general aspects of protein structure and evolution and the relationship between the structure and function of selected proteins. Three hours of lecture. (Letter grades only.) (W)

BIGR 223B. Advanced Animal Virology (3)

The course follows BIGR 223A, Protein Biochemistry, beginning the third week. The course will consist 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 will include lectures and discussion of selected papers. (Letter grades only.) (S)

BIGR 223C. Advanced Immunology (3)

The course will be devoted to immunology and will be 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. (Letter grades only.) (S)

BIGR 223D. Advanced Topics in Plant Biology (3)

This course will cover 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 will include lectures and discussion of selected papers. *Prerequisites: BIGR 221A, 221B, and 222.* (Letter grades only.) (S)

BIGR 223E. Advanced Neurobiology (3)

Graduate course, presuming advanced knowledge of cell and molecular biology, which covers modern molecular, cellular, developmental, and physiological aspects of neurobiology. *Prerequisites: BIGR 221A, 221B, and 222.* (Letter grades only.) (S)

BIGR 231. Techniques in Electron Microscopy (3)

Theoretical aspects of electron microscopy and practical training in basic techniques, including photography. Two hours of lecture and four to six hours of laboratory. Students may be interviewed by instructor before registering in this course. Open to undergraduates with consent of instructor. *Prerequisite: consent of instructor.* (S/U grades only.) (Quarter offered is variable, and course is not offered every year.)

BIGR 232. Human Retrovirology (3)

This course will consist of both lectures and journal reviews on replication, genetic regulation and pathogenesis of HIV and HTLV, and on recent developments of vaccine and therapy against AIDS. *Prerequisite: BICD 100 or the equivalent.* (S/U grades permitted.) (S) Open to upper-division students with consent of instructor.

BIGR 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 permitted.) (Quarter offered is variable, and course is not offered every year.)

BIGR 234. Developmental Neurobiology (3)

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 neuroglia interactions. Extrinsic controls of survival, growth and maturation of neural cells. Neuritis

growth and synapse formation. Potential for plasticity and regeneration in the nervous system. (S/U grades permitted.)

BIGR 235. Biology and Biochemistry of Cancer Cells (2)

This course will cover 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 will meet two hours per week for lecture and discussion. It will be at an advanced graduate level but will be open to a limited number of seniors (with permission of instructor) on a P/NP basis. (S/U grades only.) (Quarter offered is variable, and course is not offered every year.)

BIGR 236. 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. (S/U grades permitted.) This course is cross-listed with Medicine 225. (S)

BIGR 240. Cellular Neurobiology (2)

Students read classic and modern papers that form the basis of the undergraduate lectures (BIOP 140), 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)

BIGR 241. Neurobiology Seminar (3)

Presentation of current research by local and visiting neurobiologists. (S/U grades only.) (F,W,S)

BIGR 242. Systems Neurobiology (2)

Students read classic and modern papers that form the basis of the undergraduate lectures (BIOP 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)

BIGR 244. Molecular/Developmental Neurobiology (2)

Students read classic and modern papers that form the basis of the undergraduate lectures (BIOP 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)

BIGR 246. Systems Neurophysiology (3)

Ways in which neurons are assembled into circuits to achieve perception and patterned movement. (S/U grades only.) (S)

BIGR 248. Anatomical and Physiological Methods in Neurobiology (3)

Survey of contemporary anatomical and physiological methods and how to apply them in answering basic questions in neurobiology. *Prerequisites: open to graduate students and seniors with consent of instructors.* (S/U grades only.) (S)

BIGR 250. Topics in Developmental Neurobiology (3)

Weekly presentations of recent papers and journal articles on the development of the nervous system by faculty and students. (S/U grades only.) (S)

BIGR 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 will include viral persistence, latency, and approaches to viral chemotherapy. Three hours of lecture. *Prerequisite: biochemistry.* (Not open to undergraduates.) (S/U grades only.) (F)

BIGR 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)

BIGR 253. Immunology (3)

Graduate students will explore topics in specialized areas of immunochemistry and cellular immunology, antigenic and molecular structure of immunoglobulin molecules; antigen-antibody 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.) (F)

BIGR 254. Cell and Membrane Physiology (3)

This course is a survey covering current subjects in membrane biology relevant to medicine. Subjects to be included: 1) membrane isolation, composition, and structure; 2) consequences of membrane fluidity (mode of action of anesthetics, intercellular communication, exo- 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.) (F)

BIGR 255. Clinical Correlates (2)

Clinical correlates will stress the close ties between clinical medicine and basic science and the two-way interactions among practicing doctors and research scientists. Most sessions will 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, BIGR 251, 252, 253, and 254 to be taken simultaneously.* (S/U grades only.) (F)

BIGR 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 BIGR 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 BIGR 271 will be completed. No BIGR 271 application forms will be accepted after that date.

BIGR 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)

BIGR 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.* (F,W,S)

BIGR 299. Thesis Research in Biology (1-12)

(F,W,S)

BIGR 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)

BIOMEDICAL SCIENCES

OFFICE: 5008 Basic Science Building, School of Medicine

Professors

- Roland C. Blantz, M.D., *Medicine*
 Colin M. Bloor, M.D., *Pathology*
 Robert A. Brace, Ph.D., *Reproductive Medicine*
 Joan Heller Brown, Ph.D., *Pharmacology*
 Marvin R. Brown, M.D., *Medicine*
 Webster K. Cavenee, Ph.D., *Medicine*
 Kenneth R. Chien, M.D., Ph.D., *Medicine*
 Shu Chien, M.D., Ph.D., *AMES and Medicine*
 James W. Covell, M.D., *Medicine and Bioengineering*
 Edward Dennis, Ph.D., *Chemistry*
 Wolfgang H. Dillmann, M.D., *Medicine*
 Vincent E. Dionne, Ph.D., *Pharmacology*
 Mark H. Ellisman, Ph.D., *Neurosciences*
 Scott Emr, Ph.D., *Medicine*
 Gregory F. Erickson, Ph.D., *Reproductive Medicine*
 Ronald M. Evans, Ph.D., *Adjunct/Biology*
 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*
 Philip Groves, Ph.D., *Psychiatry*
 A. F. Hofmann, M.D., Ph.D., *Medicine*
 Stephen B. Howell, M.D., *Medicine*
 Paul A. Insel, M.D., *Pharmacology*
 Martin F. Kagnoff, M.D., *Medicine*
 Michael Karin, Ph.D., *Pharmacology*
 Ronald Kuczenski, Ph.D., *Psychiatry*
 Hyam L. Leffert, M.D., *Pharmacology*
 Daniel T. O'Connor, M.D., *Medicine*
 Jerrold M. Olefsky, M.D., *Medicine*
 George Palade, Ph.D., *Medicine*
 Morton P. Printz, Ph.D., *Pharmacology*
 Douglas D. Richman, M.D., *Medicine/Pathology*
 M. Geof Rosenfeld, M.D., *Medicine*
 Geert Schmid-Schoenbein, Ph.D., *AMES and Medicine*
 Jerry A. Schneider, M.D., *Pediatrics*
 David S. Segal, Ph.D., *Psychiatry*
 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*
 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*
 Stephen I. Wasserman, M.D., *Medicine*
 John B. West, M.D., Ph.D., *Medicine*

Flossie Wong-Staal, Ph.D., *Medicine and Biology*
 Tony L. Yaksh, Ph.D., *Anesthesiology and Pharmacology*

Associate Professors

- Kim E. Barrett, Ph.D., *Medicine*
 Michael Bevilacqua, M.D., Ph.D., *Pathology*
 Laurence L. Brunton, Ph.D., *Medicine/Pharmacology*
 Thomas E. Carew, Ph.D., *Adjunct/Medicine*
 Pojen Chen, Ph.D., *Medicine*
 Mario Chojkier, M.D., *Medicine*
 John C. Khoo, Ph.D., *Adjunct/Medicine*
 Thomas J. Kipps, M.D., Ph.D., *Medicine*
 Richard Lieber, Ph.D., *Surgery*
 Carol MacLeod, Ph.D., *Medicine*
 Odile Mathieu-Costello, Ph.D., *Medicine*
 Stephen J. Pandol, M.D., *Medicine*
 Sampath Parthasarathy, Ph.D., *Adjunct/Medicine*
 Frank L. Powell, Ph.D., *Medicine*
 Robert H. Tukey, Ph.D., *Medicine and Pharmacology*
 Virgil L. Woods, Jr., M.D., *Medicine*
 Maurizio Zanetti, M.D., *Medicine*

Assistant Professors

- Xiang-Dong Fu, Ph.D., *Medicine*
 Jerold J. M. Chun, M.D., Ph.D., *Pharmacology*
 Christopher Glass, M.D., Ph.D., *Medicine*
 Carolyn J. Kelly, M.D., *Medicine-Nephrology*
 Diana L. Marquardt, M.D., *Medicine*
 Judy Meinkoth, Ph.D., *Medicine*
 Harvey Motulsky, Ph.D., *Pharmacology*
 Alexis Traynor-Kaplan, Ph.D., *Adjunct/Medicine*
 Nicholas J. G. Webster, Ph.D., *Medicine*

THE GRADUATE PROGRAM

The graduate program offered by the Group in Biomedical Sciences is designed to lead to the Ph.D. degree through a combination of didactic study, laboratory rotations, and thesis research in basic biomedical sciences. Research experiences are wide and varied, permitting students the options of selecting molecular, cellular, or organ system 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 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 cellular 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 selected by the middle of the second 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, and the AMES Bioengineering Group. 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 a definition of neurotransmitter and hormone action. 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 three specialized centers of research at the university focusing on myocardial ischemia, hypertension, and atherosclerosis. Other faculty are directors of training grants for programs in pulmonary physiology, cardiovascular physiology, cellular and molecular pharmacology, hypertension, metabolic diseases, and molecular 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 problem in an area unrelated to his or her major interest. The second part, the major proposition examination, deals with the dissertation problem and should be completed 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. Same prerequisites 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.* (F,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. Seminar in Cardiovascular Physiology (1)

This seminar surveys cardiovascular physiology with the emphasis on structure, mechanics, and energetics of cardiac muscle. An introduction to the theoretical basis of the fundamental approach to research problems in cardiovascular physiology is provided. *Prerequisites: BMS 206 and 206L and consent of instructor.* (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, biochem., molec. biol., biomedical sciences or consent of instructor.* (Not offered in 1993-94.) (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. *Prerequisites: consent of instructor.* (F,W,S)

233. Human Retrovirology (3)

This course will consist of both lectures and journal reviews on replication, genetic regulation and pathogenesis of HIV and HTLV, and on recent development of vaccine and therapy against AIDS. *Prerequisite: Biology 106 or equivalent.*

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)

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. Introduction to Cardiovascular Physiology (3)

Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs, and microcirculation. Included will be the physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart, descriptions of special vascular beds including their biological and hemodynamic importance. Integration of separate components through nervous and humoral controls will be analyzed. (W)

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. *Prerequisite: completion of minor position 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. Graduate Seminar (1)

For first-year graduate students. Each week a different faculty member will discuss his or her research in the broad areas of physiology, pharmacology, or molecular biology. For advanced graduate students: discussion of current research and pertinent literature on a rotating basis. *Prerequisite: consent of instructor.* (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—1060-113 Urey Hall Addition

Graduate Student Affairs—1060-121 Urey Hall Addition

Undergraduate Student Affairs—1060-115 Urey Hall Addition

Chair's Office—1060-113 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.

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 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.

- 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 or 7A-B; and Chemistry 6BL-CL. (3) BILD 1.* (4) Mathematics 2DA-EA-F, or 2DH-EH-FH.

- b. Upper-division:
 (1) Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153. (2) Chemistry 131, 140A-B, 143A. (3) BIBC 100, BIBC 103, BIMM 100, BICC 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. 131	BIMM 100
BICD 100		BICC 110

*The Department of Biology is renumbering 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 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-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, or 7A-B; and Chemistry 6BL-CL. (3) BILD 1.* (4) Mathematics 2DA-EA-F, or 2DH-EH-FH.

- b. Upper-division:
 (1) Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153. (2) Chemistry 126 or 131, 140A-B, 143A. (3) BIBC 100, BIMM 100, BICC 110, BICD 100.* (4) Mathematics 110. (5) Restricted elective: one biology course (BICD 130, BICD 134, or BIMM 112).*

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. 126 or 131	Phys. 153
BICD 100	Restr. Elec.	BICC 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. Students interested in working toward a graduate degree in an area of biophysics receive their degrees from the department of their thesis supervisor.

*The Department of Biology is renumbering all biology courses effective fall quarter 1993. See "Biology" for conversion of old course numbers to new course numbers.

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 graduate students during registration week for the purpose of enabling the faculty to give them better guidance in their graduate work. Performance on this test has no bearing on the students' status in graduate school.

REQUIREMENTS FOR THE PH.D.

Students are required to pass a written examination, advanced graduate courses, an oral topic examination, a qualifying examination, and a final defense of the thesis as described below.

1. Departmental Written Examination

Biophysics students are required to take a written 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 take six courses 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 five of the six 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 one-half-hour talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour 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.

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 C.Phil. degree.

5. Teaching Requirement

All students are expected to participate in the physics undergraduate teaching program. After

passing the departmental examinations and course requirements and before completing a dissertation, students are required to take a total of no fewer than two units of Physics 500 (Physics Instruction). Each unit corresponds to approximately five hours per week for one quarter in laboratory sections, recitation sections, or problem sessions. (This requirement may be waived in special cases by the vice chair, education.)

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, Biochemistry, Chemistry, and Physics.

CHEMISTRY

Chair's Office: 2040 Urey Hall Addition
(619) 534-3575

Undergraduate Student Affairs: 4000 York Hall
(619) 534-4856

Graduate Student Affairs: 2060 Urey Hall Addition
(619) 534-6871
Revelle College

Professors

William S. Allison, Ph.D.
James R. Arnold, Ph.D., *Professor Emeritus*
Marjorie C. Caserio, Ph.D., *Vice Chancellor, Academic Affairs*
Leigh B. Clark, Ph.D.
Edward A. Dennis, Ph.D.
Daniel J. Donoghue, Ph.D.
Russell F. Doolittle, Ph.D.
Robert C. Fahey, Ph.D.

CHEMISTRY

Murray Goodman, Ph.D.
Elvin Harper, Ph.D.
David N. Hendrickson, Ph.D.
Martin D. Kamen, Ph.D., *Professor Emeritus*
David R. Kearns, Ph.D., *Professor Emeritus*
Joseph Kraut, Ph.D.
Jack Kyte, Ph.D.
Katja Lindenberg, Ph.D., *Chair*
Douglas Magde, Ph.D.
Kurt Marti, Ph.D.
Trevor C. McMorris, Ph.D.
Stanley L. Miller, Ph.D.
Xuong Nguyen-Huu, Ph.D.
K.C. Nicolaou, Ph.D.
Hans Oesterreicher, Ph.D.
Charles L. Perrin, Ph.D.
Gerhard N. Schrauzer, Ph.D.
Kurt E. Shuler, Ph.D., *Professor Emeritus*
John D. Simon, Ph.D.
Hans E. Suess, Ph.D., *Professor Emeritus*
Susan Taylor, Ph.D.
Mark Thiemens, Ph.D.
T. Don Tilley, Ph.D.
Teddy G. Traylor, Ph.D., *Professor Emeritus*
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.
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*
Joseph O'Connor, Ph.D.
Jay Siegel, Ph.D.

Assistant Professors

Robert E. Continetti, Ph.D.
John E. Crowell, Ph.D.
Daniel F. Harvey, Ph.D.
Elizabeth A. Komives, Ph.D.
Andrew C. Kummel, Ph.D.
David A. Roise, Ph.D.
Michael J. Sailor, Ph.D.
Amitabha Sinha, Ph.D.

Adjunct Professor

Leslie E. Orgel, Ph.D.

INTRODUCTION

The UCSD Department of Chemistry 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, em-

brace diverse applications of those principles at the frontiers of knowledge.

The department is organized into two divisions: the Division of Biochemistry and the Division of Chemistry.

Degrees offered include:

Division of Biochemistry

B.A. Chemistry/Biochemistry
B.S. Chemistry/Biochemistry
M.S. Chemistry
Ph.D. Chemistry

Division of Chemistry

B.A. Chemistry
B.A. Chemistry/Environmental Science
B.S. Chemistry
B.S. Chemistry/Chemical Physics
B.S. Chemistry/Earth Sciences
B.S. Chemistry/Chemical Education
M.S. Chemistry
Ph.D. Chemistry

(The department normally does not accept students who desire a terminal M.S. degree.)

CHEMISTRY-PREMEDICAL MAJORS

Either a chemistry/biochemistry major or a chemistry major with appropriate choice of electives provides a strong background for students intending to pursue careers in the medical sciences. Premedical students are encouraged to complete the three-quarter 141 organic sequence in their sophomore year. Most medical schools require a full year of organic chemistry. Biology 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. The Chemistry 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 FOR BOTH DIVISIONS

The following courses must be taken for a letter grade:

1. General Chemistry (Chem. 6A-B-C or Chem. 7A-B) including laboratory (Chem. 6BL-CL) or equivalent.
2. Phys. 2A-B-D (Phys. 1A-B-C is also acceptable). Phys. 2C is also required for the B.S. 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. 2DA (differential equations), either Math. 2A-2DA or Math. 1A, 1B, 1C, 2C (two units), 2DA.
4. Chemical physics has additional lower-division requirements. See below.
5. Recommended, but not currently required: Math. 2E 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 from both divisions.

The suggested programs following each of the major descriptions are only examples.

DIVISION OF BIOCHEMISTRY CHEMISTRY/BIOCHEMISTRY MAJOR

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.

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 (normally Chem. 141A-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-B, 105A, either 112A or 112B and one additional lab).
6. Two elective courses from the following list: Chem. 112B, 113, 116, 117, 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 or from the following list of courses offered by the Department of Biology: Biol. 108, 111, 113, 114, 131, 141, 143, 151, 153, 156. Other electives may be arranged by petition.
8. For the B.S. degree two additional chemistry electives are required. Chem. 199 may be used for one of these electives for the B.S. but not for the B.A. Chem. 195 may not be used for these electives.

SUGGESTED PROGRAM FOR CHEMISTRY/BIOCHEMISTRY B.S. MAJOR:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
	Chem. 6BL	Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
SOPHOMORE YEAR		
Chem. 141A	Chem. 141B	Chem. 141C
	Chem. 143AM	Chem. 143B
Biol. 1*		
Math. 2D	Phys. 2B	Phys. 2C***
Phys. 2A		Phys. 2CL
JUNIOR YEAR		
Chem. 114A	Chem. 114B	Chem. 114C
Chem. 126	Chem. 127	Chem. 105A
Phys. 2D	Chem. 112A**	Elective***
SENIOR YEAR		
Chem. 120A	Elective Lab	Elective***
Elective	Elective	Elective

*Recommended, but not required.

**or 112B in the spring.

***Not required for the B.A.

DIVISION OF CHEMISTRY CHEMISTRY MAJOR

The upper-division requirements for the chemistry major are:

1. One year of physical chemistry (131, 132, 133). The 126, 127, 128 sequence, although of comparable difficulty, is not intended for chemistry majors.
2. One year of organic chemistry (141A-B-C).
3. Two quarters of inorganic chemistry (120A, 120B).
4. One quarter of biochemistry (Chem. 114A).
5. Five laboratory courses (Chem. 143A-B, 105A and two of the following: Chem. 106, 112A, 123, 143C, or 105B).
6. Three additional four-unit upper-division or graduate courses in chemistry or related areas. At least two of these courses must be other than 195 or 199.
7. For B.S. degree two additional chemistry electives are required.

SUGGESTED PROGRAM FOR CHEMISTRY B.S. MAJOR:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
	Chem. 6BL	Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
SOPHOMORE YEAR		
Chem. 141A	Chem. 141B	Chem. 141C
	Chem. 143AM	Chem. 143B
Math. 2D	Phys. 2B	Phys. 2C*
Phys. 2A		Phys. 2CL
JUNIOR YEAR		
Chem. 131	Chem. 132	Chem. 133
Chem. 120A	Chem. 120B	Elective Lab
Chem. 114A	Phys. 2D	
SENIOR YEAR		
	Elective Lab	Elective
Chem. 105A	Elective	Elective
Elective	Elective*	Elective*

*Not required for the B.A.

CHEMISTRY/CHEMICAL PHYSICS MAJOR

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 chemistry/chemical physics major is designed as a preparation for graduate work. It requires completion of Phys. 2A-2D, Chem. 7A-7B or Chem. 6A-6C, and the Math. 2 sequence through 2F by the end of the sophomore year, along with the lower-division labs Chem. 6BL, 6CL, and Physics 2CL or equivalent. The upper-division requirements are the same as for the chemistry B.S. major, except: Chem. 141C is not

required. Chem. 114A is not required, but can substitute for Chem. 120B. The five upper-division chemistry labs are: Chem. 105A, 106, 143A, 143C and one of 112A, 123, or 143B. Math. 110, and Phys. 110A, 110B or 100A, 100B, and Chem. 133 or 135 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 CHEMISTRY/CHEMICAL PHYSICS B.S. MAJOR:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
	Phys. 2A	Phys. 2B
	Chem. 6BL	Phys. 2CL
Math. 2A	Math. 2B	Math. 2C
SOPHOMORE YEAR		
Chem. 141A	Chem. 141B	Chem. 143A
Math. 2D	Math. 2E	Math. 2F
Phys. 2C	Phys. 2D	
Chem. 6CL		
JUNIOR YEAR		
Chem. 131	Chem. 132	Chem. 133
	Chem. 105A	Chem. 143C
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. 110B	
or Phys. 100A	or Phys. 100B	
Elective Lab	Chem. 106	Elective

*Chem. 114A (fall quarter) may be substituted.

CHEMISTRY/EARTH SCIENCES MAJOR

A chemistry major with specialization in earth sciences is also available for undergraduates. See "Earth Sciences" for description of this program, which may be arranged by consultation with advisers in the Department of Chemistry and Scripps Institution of Oceanography.

The required upper-division chemistry courses are: Chem. 141A, 141B; Chem. 131, 132, 133; Chem. 120A; Chem. 114A or Chem. 120B. The five upper-division labs are: 105A, 106, 143A, ES 162L and one of 105B, 123, 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, 272. 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 pro-

CHEMISTRY

professional geologic work with their undergraduate degrees. Students are encouraged to take at least one quarter of Chem. 199. The courses should be taken in the order given in the suggested program.

SUGGESTED PROGRAM FOR CHEMISTRY/EARTH SCIENCES B.S. MAJOR:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B Chem. 6BL	Chem. 6C Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
SOPHOMORE YEAR		
Chem. 141A Math. 2D	Chem. 141B Phys. 2A	Chem. 143A Phys. 2B Phys. 2CL
JUNIOR YEAR		
E.S. 101 Chem. 131	E.S. 102 Chem. 132 Phys. 2D	E.S. 103 Chem. 133 E.S. 120
SENIOR YEAR		
Chem. 105A Chem. 120A Elective	Chem. 120B* E.S. 162 E.S. 162L Chem. 106	Elective Elective Lab

*Chem. 114A (fall quarter) may be substituted.

CHEMISTRY/CHEMICAL EDUCATION MAJOR

This chemistry program offers an excellent preparation for teaching physical science in secondary schools, including chemistry, physics, earth science, biology, and mathematics. The chemistry/chemical education program is expected to have American Chemical Society accreditation.

The chemistry/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 CHEMISTRY/CHEMICAL EDUCATION MAJOR

The following courses must be taken for a letter grade:

1. General Chemistry (Chem. 6A-B-C or Chem. 7A-B) including laboratory (Chem. 6BL-CL) or equivalent.
2. Physics 2A-B-C (2D can substitute for 2C). Two units of physics laboratory. Physics 2CL is recommended. (Physics 2BL and 2DL are acceptable.) Physics 2CL is accessible without Physics 2C.
3. Math. 2A-B-C.
4. Biol. 1.
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 (normally 141A-B-C).
3. One quarter of inorganic chemistry (Chem. 120A).
4. One quarter of biochemistry (Chem. 114A).
5. Five laboratory courses (Chem. 143AM, 143B, 105A, and two of 112A, 112B, 105B, 106, or 123).
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 171A-B-C.

SUGGESTED PROGRAM FOR CHEMISTRY/CHEMICAL EDUCATION B.S. MAJOR:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B Chem. 6BL	Chem. 6C Chem. 6CL
Math. 2A	Math. 2B	Math. 2C
SOPHOMORE YEAR		
Chem. 141A Chem. 143AM Phys. 2A	Chem. 141B Chem. 143B Phys. 2B	Chem. 141C Biol. 1 Phys. 2C Phys. 2CL
JUNIOR YEAR		
Chem. 126 Chem. 114A Earth Sci. 101	Chem. 127 Elective Lab Earth Sci. 102	Chem. 195
SENIOR YEAR		
Chem. 120A Chem. Elective TEP 171A	Chem. 105A Chem. 199 or 196 TEP 171B	Elective Lab TEP 171C

CHEMISTRY/ENVIRONMENTAL SCIENCE MAJOR

The environmental science 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 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 or Chem. 7A-B) including laboratory (Chem. 6BL-CL) or equivalent.
2. Physics 2A-B-C (Phys. 1A-B-C is also acceptable).
3. Math. 2A-B-C.
4. Econ. 2A-B.

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. 143A, 106).
6. Two quarters of environmental chemistry (Chem. 149A-B).
7. Atmospheric chemistry (Chem. 173).
8. Two quarters of political science (Poli. Sci. 160AA, 160AB).
9. Four elective courses chosen from the following list: ES 101, ES 102, ES 103, Econ. 2C, Econ. 131, Biol. 1, Biol. 2, Biol. 3, Biol. 162, Biol. 169, AMES 119A, AMES 119B, AMES 119C, Chem. 105A, Chem. 105B, Chem. 112A, Chem. 112B, Chem. 114B, Chem. 114C, Chem. 120B, Chem. 123, Chem. 143B, Chem. 143C, Chem. 199.

SUGGESTED PROGRAM FOR CHEMISTRY/ENVIRONMENTAL SCIENCE B.A. MAJOR

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A Math. 2A	Chem. 6B Math. 2B	Chem. 6C Math. 2C Chem. 6BL
SOPHOMORE YEAR		
Chem. 140A Chem. 149A Chem. 6CL	Chem. 140B Chem. 149B Phys. 2A	Chem. 140C or Elect. Chem. 173 Chem. 143A Phys. 2B
JUNIOR YEAR		
Chem. 126 Econ. 2A Phys. 2C	Chem. 127 Econ. 2B Elect.	Elect.
SENIOR YEAR		
Chem. 114A Poli. Sci. 160AA Chem. 120A or Elect.	Chem. 106 Poli. Sci. 160AB	Elect.

HONORS PROGRAM

The Department of Chemistry offers an Honors Program to those students who have demonstrated excellence in any of the six majors. Students are eligible for admission to the program when they have:

1. Completed ninety units of courses, including twenty-two units of chemistry courses.
2. Achieved a GPA of 3.2 overall and 3.4 in chemistry courses.
3. Submitted an honors thesis research proposal to the faculty committee in charge and obtained approval for that thesis topic.

Successful completion of the Honors Program requires:

1. Maintenance of a GPA of 3.2 overall and 3.4 in chemistry.
2. Registration for a minimum of eight units of chemistry 199, distributed over at least two quarters. These units must be in addition to the ordinary major requirements. However, 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. Acceptance of a written honors thesis report by a committee of not fewer than three faculty.
4. Presentation of an oral report on the thesis research, preferably at a public undergraduate research conference on this campus or at a chemistry conference off-campus, or, lacking that opportunity, at a seminar involving the honors students and three faculty.

Students who are interested in the Honors Program should contact Debbie O'Hagan, 4000 York Hall, and are invited to do so at any time, even well before completing ninety units.

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, or environmental chemistry or biochemistry. Courses required by a student's major may not be applied toward a minor. 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.

OFFICE CONTACT

The departmental Student Affairs Office is located in 4000 York Hall. Majors and prospective majors are encouraged to contact this office.

THE GRADUATE PROGRAM

The department accepts students for study toward the Ph.D. in either the Division of Chemistry or the Division of Biochemistry. The doctoral program is designed to encourage initiative on the part of the student and to develop habits of independent study. Students with normal preparation start research early.

There are some small differences between the Divisions of Chemistry and Biochemistry. Such details, along with comprehensive descriptions of research activities in both divisions, can be found in the Department of Chemistry's graduate brochure.

Students whose native language is not English must submit TOEFL scores. A student must demonstrate a mastery of English adequate to permit him or her to satisfy the teaching requirement. A foreign student must remedy any deficiency by the end of the first year of residency. 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 order that they may participate effectively in this program, entering graduate students will be required to have a mastery of the subjects usually presented in an undergraduate chemistry curriculum. So that students may be properly advised, their mastery of these undergraduate subjects will be tested by written examination on their arrival. Deficiencies in undergraduate prepa-

ration must be remedied during the first year of graduate study.

In the first year the student will usually take at least six of the graduate courses listed below, plus Chem. 250, which is required. The student may also take upper-division undergraduate courses. Depending on the student's special interests, he or she may take courses in other departments. Students enrolled in the Ph.D. program are expected to select a research adviser during their first year. In the second year the student will usually carry a lighter load of formal courses, but will continue to participate in seminars and informal study groups.

In the winter quarter of the second year, there is an oral departmental exam covering an area of current research interest. This exam, along with the course work, will usually qualify the student for receipt of the M.S. degree. The oral qualifying exam covering the student's Ph.D. thesis project is taken before the end of the third year. Successfully passing the oral qualifying examination advances the student to candidacy for the Ph.D. The candidate then devotes most of his or her time to thesis research and study. A final examination is conducted by the student's doctoral committee upon completion of the dissertation. The examination is oral and deals with the dissertation and its relation to the general field of study.

All graduate students are required to participate in the graduate teaching program as a part of their educational experience. Course credit is obtained for this teaching by registration in Chem. 500.

The interdisciplinary tradition is strong on the San Diego campus. The chemistry faculty has close ties with the Departments of Applied Mechanics and Engineering Sciences, Biology and Physics, as well as with the Scripps Institution of Oceanography and the School of Medicine. Facilities are thus available to the graduate student for study or collaboration in a wide variety of interdisciplinary fields.

DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced 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.

JOINT DOCTORAL PROGRAM WITH SAN DIEGO STATE UNIVERSITY

The Department of Chemistry at UCSD cooperates with the Department of Chemistry in the Division of the Physical Sciences, San Diego

State University, in offering a joint program of graduate study leading to the Ph.D. degree in chemistry.

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University. Requirements for the Ph.D. are the same as those above except that only one quarter of teaching is required during the first year of residence at UCSD.

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 or Math. 1A (may be taken concurrently).* (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. *Prerequisite: proficiency in high school chemistry or physics and in high school mathematics; Math. 4C or equivalent.* (F,W,S)

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. 2A or 1A.* (F,W,S)

6BL. Introductory Inorganic Chemistry Laboratory (2)

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 7A, 6B, or 6C. Formerly Chem. 8AL. (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)

6CL. Introductory Analytical Chemistry (3)

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. Formerly Chem. 8BL. *Prerequisite: Chem. 6BL.* (F,W,S)

7A. Honors Chemistry (4)

First quarter of a two-quarter honors sequence, for science and engineering majors with strong preparation in mathematics and science. Topics include: models for the behavior of gases, liquids and solids, principles of thermodynamics and chemical equilibrium, and representative applications. *Prerequisites: Math. 2A (may be taken concurrently) and strong high school chemistry and physics. Concurrent registration in Chem. 6BL is recommended.* (May not be offered every year.)

7B. Honors Chemistry (4)

Second quarter of the honors sequence, for science and engineering majors with strong preparation in mathematics and science. Topics include: principles of chemical bonding, with representative application, rates and mechanisms of chemical reactions, and comparisons between theoretical and experimental approaches to solving chemical problems. *Prerequisites: Chem. 7A and Math. 2B (may be taken concurrently).* (May not be offered every year.)

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.* (W)

13. Chemistry of Life (4)

Introduction to biochemistry for nonscience majors. *Prerequisite: Chem. 12.* (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.

91. Undergraduate Seminar (1)

A seminar intended for exposing undergraduate students, especially freshmen and sophomores, to exciting research programs conducted by the faculty. Enrollment is limited.

UPPER DIVISION

105A. Physical Chemistry Laboratory (3)

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 (2)

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 (4)

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 Biology 103.) (W)

112B. Molecular Biochemistry Laboratory (4)

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.* (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).* (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 Biology 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 Biology 100.) (S)

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.)

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)

120C. Inorganic Chemistry (4)

The reactivity of molecules is examined from a kinetic and mechanistic point of view. Properties affecting reactivity are examined and case studies of reactions are discussed in detail. *Prerequisite: Chem. 120B or consent of instructor.* (May not be offered every year.)

121. Energy Transduction (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.*

126. 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. 7B or Chem. 6C, Math. 2C, or consent of instructor.* (Note: Students may not receive credit for both 126 and 131.) (F)

127. Physical Chemistry (4)

An introduction to physical chemistry with emphasis on biochemical and environmental applications. Enzyme kinetics, electrochemistry, electromagnetic spectrum, biochemical techniques. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, Chem. 126 or consent of instructor.* (Note: Students may not receive credit for both 127 and 132.) (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. 7B or Chem. 6C, Math. 2C and 2D, Chem. 127 or 132, or consent of instructor.* (S)

131. Physical Chemistry (4)

Thermodynamics, chemical equilibrium, phase equilibrium, chemistry of solutions. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C, 2D, or consent of instructor.* (Note: Students may not receive credit for both 131 and 126.) (F)

132. Physical Chemistry (4)

Chemical statistics, kinetic theory, reaction kinetics. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C, 2D, Chem. 131, or consent of instructor.* (Note: Students may not receive credit for both 132 and 127.) (W)

133. Physical Chemistry (4)

Quantum mechanics, atomic and molecular spectroscopy, molecular structure. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, 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. 2A and 2B or equivalent.* (NOTE: Students may receive credit for only one of the following: Biology 181, Chemistry 134.) (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. 2D 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. 2D.* (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 7B or equivalent course in general chemistry.* (NOTE: Students may not receive credit for both 140A and 141A.) (F,W)

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.) (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.* (F,S)

141A. Organic Chemistry (4)

Chem. 141A introduces theoretical and experimental studies of structure and properties of covalent molecules. Both resonance and simple molecular orbital descriptions of organic compounds are introduced and spectroscopic methods for determining electronic and molecular structure are discussed. Organic reactions are introduced with synthetic and mechanistic examples. *Prerequisites: Chem. 7B or 6C (6C may be taken concurrently by good students).* *Prior or concurrent physics recommended.* (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.* (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.* (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 (2)

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 (may be taken concurrently).* (F,W,S)

143AM. Majors Organic Chemistry Laboratory (2)

An organic chemistry laboratory intended for chemistry majors. It is similar to Chem. 143A, but with emphasis on instrumental methods of product identification, separation, and analysis. *Prerequisites: Chem. 6BL; Chem. 141A is to be taken concurrently.* (W)

143B. Organic Chemistry Laboratory (4)

Continuation of 143A, emphasizing synthetic methods of organic chemistry. *Prerequisites: Chem. 143A; 141B or 140B (may be taken concurrently).* (S)

143C. Organic Laboratory (4)

Identification of unknown organic compounds by a combination of chemical and physical techniques. *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 Biol. 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.*

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 Department 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.

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: tyrosine 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.

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.)

214. History of Biochemistry (2)

A summary of the contributions which led to the major concepts in the field of biochemistry. Emphasis will be placed on the research approach taken by eminent individuals. *Prerequisite:* Chem. 211. (May not be offered every year.)

215. Nutritional Biochemistry (2)

The biochemical basis of human nutrition will be emphasized. *Prerequisites:* Chem. 211, which may be taken concurrently; graduate-student standing. (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; antigen-antibody 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. Energy Transduction (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.)

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.

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. 2D or equivalent; Chem. 190 may be taken concurrently.

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.

232. Statistical Mechanics of Chemical Systems (4)

Equilibrium statistical mechanics, distribution functions, and partition functions. Boltzmann, 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.

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.

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. 2D or Chem. 190/290.

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

C HINESE 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*
 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 Professor

Barry J. Naughton, Ph.D., *IR/PS*

Assistant Professor

Dorothy Ko, Ph.D., *History*

Lecturer WSOE

Ping C. Hu, M.A., *Chinese*

Visiting Lecturers

Xiao-gang 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 strongest programs on modern Chinese society now available. Another focal point of research interest is the intellectual history and the evolution of scientific ideas and technology in 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

transformations, and advanced topics in statistical mechanics, thermodynamics, and chemical kinetics. (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)

253. Current Topics in Chemistry (2)

This course is designed to present recent publications in areas of chemistry which are related to the field in which graduate students are doing thesis work. Original papers are presented by both faculty and students, followed by discussion of the material presented. *Prerequisite: consent of instructor.* (S/U grades only.) (May not be offered every year.)

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 metabol-

ism, the regulation of lipid metabolism, and application to the treatment of specific human diseases. (May not be offered every 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.*

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.)

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.*

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)

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 1992-93 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 an A track for students with no Chinese language background and a B track for students with some Chinese language background.

30. **Introduction to Chinese Language (4)**

Introduces a basic knowledge of Chinese language: the characteristics of modern Chinese, its phonetic, grammatic and writing systems, the historical development of the language, Chinese dialects; colloquial and literary styles, etc.

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) (formerly AN 144)
- ANRG 171: Chinese Familism (Jordan) (formerly AN 109)
- ANRG 172: Culture and Personality in China (Jordan) (formerly AN 136)
- ANRG 173: Chinese Popular Religion (Jordan) (formerly AN 103)
- History HITO 102: Asian Religions (Staff)
- History HIEA 164: 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

- Page Ann duBois, Ph.D., *Classical and Comparative Literature*
- Richard E. Friedman, Ph.D., *Hebrew and Comparative Literature*
- Edward N. Lee, Ph.D., *Philosophy*
- Alden A. Mosshammer, Ph.D., *History*

Associate Professors

- Georgios H. Anagnostopoulos, Ph.D., *Philosophy*
- Anthony T. Edwards, Ph.D., *Classical Literature and Languages*
- William Fitzgerald, Ph.D., *Classical and Comparative Literature*
- Sheldon Nodelman, Ph.D., *Visual Arts*

Lecturers

- Charles Chamberlain, Ph.D., *Classical and Comparative Literature*
- Leslie Collins Edwards, Ph.D., *Classical Literature and Languages*
- Eliot Wirshbo, Ph.D., *Classical Literature and Languages*

Adjunct Faculty

- Marianne McDonald, Ph.D., *Classics*

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— 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.

HONORS IN GREEK, LATIN, AND CLASSICS

Honors is intended for the most talented and motivated students majoring in Greek, Latin, classics, or Greek and Hebrew. Requirements for admission to the honors program are:

1. Junior standing
2. An overall GPA of 3.5
3. A GPA in the major of 3.7

Qualified students majoring in Greek, Latin, or classics may apply at the end of their junior year to the program faculty on the basis of 1) a thesis proposal (three to four pages) worked out in advance with a classical studies faculty member and 2) a recommendation from that faculty member. It is strongly advised that the proposal be based upon a class paper or project from a course taken towards completion of the major.

The core of the honors program is an honors thesis. The research and writing of the thesis will be conducted over the winter or fall and winter terms of the senior year. Up to four hours of 196 credit to this end may be counted towards the major in place of one of the courses in English translation. Theses 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

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
497-6659

Professors

- Ursula Bellugi, Ed.D., *Adjunct/Psychology*
 Gary R. Birchler, Ph.D., *Clinical/Psychiatry*
 David L. Braff, M.D., *Psychiatry*
 Nelson Butters, Ph.D., *In Residence/Psychiatry*
 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*
 Nolan E. Penn, Ph.D., *Psychiatry*
 Laura Schreiberman, 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*
 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*
 J. Hampton Atkinson, Jr., M.D., *Adjunct/Psychiatry*

Karen Britton, M.D., Ph.D., *In Residence/ Psychology*

Sandra Brown, Ph.D., *In Residence/Psychiatry*

Eric Courchesne, Ph.D., *In Residence/ Neurosciences*

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*

Joan Stiles, Ph.D., *Psychology*

Doris A. Trauner, M.D., *Neurology*

Assistant Professors

Denis F. Darko, M.D., *Adjunct/Psychiatry*

Eric Granholm, Ph.D., *In Residence/Psychiatry*

Jeffrey Matloff, Ph.D., *Clinical/Psychiatry*

Thomas L. Patterson, Ph.D., *Adjunct/Psychiatry*

Jane Paulsen, Ph.D., *Adjunct/Psychiatry*

David P. Salmon, Ph.D., *In Residence/Psychiatry*

Mark Slater, Ph.D., *Adjunct/Psychiatry*

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.

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: 137 Cognitive Science Building

Professors

Richard C. Atkinson, Ph.D., *Chancellor*

Elizabeth Bates, Ph.D.

Aaron V. Cicourel, Ph.D., *Chair*

Jeffrey L. Elman, Ph.D.

Gilles Fauconnier, Ph.D.

Edwin L. Hutchins, Ph.D.

Marta Kutas, Ph.D.

Jean M. Mandler, Ph.D.

Helen J. Neville, Ph.D.

Donald A. Norman, Ph.D., *Emeritus*

David Zipser, Ph.D.

Assistant Professors

John D. Batali, Ph.D.

David Kirsh, D.Phil.

Javier R. Movellan, Ph.D.

Jaime A. Pineda, Ph.D.

Mark St. John, Ph.D.

Martin I. Sereno, Ph.D.

Adjunct Professors

David E. Rumelhart, Ph.D.

Terrence J. Sejnowski, Ph.D., *Biology and Physics*

INTRODUCTION

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 sys-

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, 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

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.

tems, 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. is recommended for majors who plan to enter the work force after graduation. Both the B.A. and the B.S. fully prepare a student for graduate studies. 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. Major requirements are not fulfilled by courses in which a grade of D is obtained. 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 2A-B-C
College requirements

Sophomore Year: Cognitive Science 14 and 17
College requirements

Junior Year: Cognitive Science 18, 108A, 108AL, 108P
Cognitive Science 101A, 101B, 101C
Cognitive Science 107A, 107B, 107C

Senior Year: Cognitive Science 181 or 182
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 2A-B-C
Cognitive Science 14
or Psychology 60 plus Philosophy 10
or Mathematics 183 plus Philosophy 10
Cognitive Science 17 or Biology 12
Cognitive Science 18

B.S. Requirements

Mathematics 2A-B-C
Cognitive Science 14
or Psychology 60 plus Philosophy 10
or Mathematics 183 plus Philosophy 10
Cognitive Science 17 or Biology 12
Cognitive Science 18

UPPER-DIVISION REQUIREMENTS

The B.A. requires completion of thirteen upper-division courses, and the B.S. requires six-

teen. 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 ten core courses:

Cognitive Science 101A-B-C
(Cognitive Theory and Phenomena)

Cognitive Science 107A-B-C
(Cognitive Neuroscience)

Cognitive Science 108A-AL-P
(Artificial Intelligence Models I and Neural Network Models of Cognition I)

and either

Cognitive Science 181
(Neural Network Models of Cognition II)

or

Cognitive Science 182
(Artificial Intelligence Modeling II)

ELECTIVES

At least half of the electives for the major must be taken in the department. One Cognitive Science 195, 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 of electives.

HONORS PROGRAM

Majors apply for admission to the honors program at 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, 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 two quarters of the Cognitive Science 10 sequence plus either a third quarter of Cognitive Science 10 or Cognitive Science 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-AL-P and 181 or 182

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.

THE GRADUATE PROGRAMS

There are two Ph.D. programs, each with different admissions and graduation requirements. The *Department of Cognitive Science* offers a Ph.D. in cognitive science. Students are admitted to UCSD directly into the department and fulfill degree requirements of the department. The *Interdisciplinary Program in Cognitive Science* offers a joint Ph.D. in cognitive science and a traditional home department (anthropology, communication, computer science and engineering, linguistics, neurosciences, philosophy, psychology, or sociology). Students are admitted to UCSD through the home department and fulfill the requirements of both the interdisciplinary program and the home department.

PH.D. IN COGNITIVE SCIENCE

This program provides broad training in neurological processes and phenomena; the experi-

mental 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.
- 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.

THE INTERDISCIPLINARY PH.D. PROGRAM

FACULTY

Professors

Norman H. Anderson, Ph.D., *Psychology*
Richard C. Atkinson, Ph.D., *Cognitive Science and Psychology*

Elizabeth Bates, Ph.D., *Cognitive Science and Psychology*
Ursula Bellugi, Ed.D., *Adjunct/Psychology*
Nelson M. Butters, Ph.D., *Professor in Residence, Psychiatry*
Patricia S. Churchland, B.Phil., *Philosophy*
Paul M. Churchland, Ph.D., *Philosophy*
Aaron V. Cicourel, Ph.D., *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 and Linguistics*
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., *Psychology*
Jean M. Mandler, Ph.D., *Cognitive Science*
Hugh B. Mehan, Ph.D., *Sociology*
Helen J. Neville, Ph.D., *Cognitive Science*
Donald A. Norman, Ph.D., *Emeritus, Cognitive Science*
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

Gerald J. Balzano, Ph.D., *Music*
Adrian Cussins, D.Phil., *Philosophy*
Dennis D. M. O'Leary, Ph.D., *Adjunct/Neurosciences*
Carol Padden, Ph.D., *Communication*
Harold E. Pashler, Ph.D., *Psychology*
Joan Stiles, Ph.D., *Psychology*
Stuart Zola-Morgan, Ph.D., *Psychiatry*

Assistant Professors

Farrell Ackerman, Ph.D., *Linguistics*
Philip Agre, Ph.D., *Communication*
John Batali, Ph.D., *Cognitive Science*
Gordon Baylis, D.Phil., *Psychology*
Richard K. Belew, Ph.D., *Computer Science and Engineering*
Garrison W. Cottrell, Ph.D., *Computer Science and Engineering*

Charles P. Elkan, Ph.D., *Computer Science and Engineering*

Adele E. Goldberg, Ph.D., *Linguistics*

Judith C. Goodman, Ph.D., *Psychology*

Suzanne Kemmer, Ph.D., *Linguistics*

David Kirsh, D.Phil., *Cognitive Science*

Robert E. Kluender, Ph.D., *Linguistics*

Paul Kube, Ph.D., *Computer Science and Engineering*

Javier R. Movellan, Ph.D., *Cognitive Science*

Jaime A. Pineda, Ph.D., *Cognitive Science*

Mark St. John, Ph.D., *Cognitive Science*

The interdisciplinary Ph.D. program is distinct from the departmental Ph.D. program (see previous section) both in admissions and graduation requirements. There are four aspects to graduate study in the interdisciplinary program: (a) a *primary specialization* in one of the established disciplines of cognitive science; (b) a *secondary specialization* in a second field of study; (c) familiarity with general issues in the field and the various approaches taken to these issues by scholars in different disciplines; and (d) an original dissertation project of an interdisciplinary character. The degree itself reflects the interdisciplinary nature of the program, being awarded jointly to the student for studies in cognitive science and the home department. Thus, students in linguistics or psychology will have degrees that read "Ph.D. in 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 ex-

pected 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), Individual and Socially 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 thorough background in computer science. For those who enter the program without much formal training in this area, the secondary specialization in computer science includes some upper-division undergraduate courses (Computer Science and Engineering 161A-B, 162, 165) and a minimum of two graduate courses (Computer Science and Engineering 250A-B). (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 may take one course in syntax (Linguistics 221A-B-C), one course in phonology, (Linguistics 211A-B-C), plus two additional courses in syntax or semantics. Alternatively, they may take two courses in phonetics/phonology (Linguistics 210, 211A-B-C), one course in syntax (Linguistics 221A-B-C), plus one additional course in phonology. In addition, they 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 the field.

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 Processing (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.

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.

phenomena and the consequences of brain damage on them are examined. (May fulfill general-education requirements; ask a college adviser.) *Prerequisites: It is recommended but not required that Cognitive Science 10A-B-C be taken in order.*

10C. Minds, Brains, and Computers III (4)

This course raises the basic question, "What is cognition?" We compare behavior in both natural and artificial systems in order to understand the basis for intelligent behavior. Topics include an introduction to neural networks and artificial life. (May fulfill general-education requirements; ask a college adviser.) *Prerequisites: It is recommended but not required that Cognitive Science 10A-B-C be taken in order.*

14. Logic and Statistics (4)

Introductory logic: propositional logic, predicate logic, some modal and nonmonotonic logic (including truth tables; inference rules, elementary proofs, variables and quantifiers, and modal operators). Introductory statistics: mean, chi square, T tests, hypothesis testing, dependent and independent variables, and analysis of variance. (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 Fifth and Third 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 2A.*

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*

Courses

LOWER DIVISION

10A. Minds, Brains, and Computers I (4)

This course provides a general introduction to cognitive science with special attention to two questions: Can computers think? In what ways do language and culture affect perception and thought? The course is part of the Cognitive Science 10A-B-C sequence. (May fulfill general-education requirements; ask a college adviser.)

10B. Minds, Brains, and Computers II (4)

Topics such as thinking, sleeping, dreaming, memory, imagery, language, perception, and development are explored from a psychological and neurological perspective. Basic cognitive

COGNITIVE SCIENCE

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. *Prerequisites: Cognitive Science 14 or Philosophy 10; Mathematics 1C or 2C.*

107A. Cognitive Neuroscience: Functional Neurobiology (4)

This first course in the Cognitive Science 107A-B-C 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. *Prerequisites: Mathematics 1C or 2C; Cognitive Science 14 or Psychology 60 or Mathematics 183; 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. 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 robots are covered. Must be taken concurrently with Cognitive Science 108AL. *Prerequisites: Cognitive Science 18; Mathematics 1C or 2C; Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

108AL. Artificial Intelligence Laboratory (2)

This is the companion course to Cognitive Science 108A. Through lectures and computational assignments, the theoretical issues of Cognitive Science 108A will be recast in a more practical, hands-on manner. Must be taken concurrently with Cognitive Science 108A. *Prerequisites: Cognitive Science 18; Mathematics 1C or 2C; Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

108P. 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 188A, and Psychology 188A.) *Prerequisites: Cognitive Science 18; Mathematics 1C or 2C; Cognitive Science 14 or Psychology 60 plus Philosophy 10 or Mathematics 183 plus Philosophy 10.*

113. Cognitive Development (4)

This course examines the foundations and growth of mind, discussing the development of perception, imagery, concept for-

mation, 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.*

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. May not be offered in 1993-94.) *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.*

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; Cognitive Science 101C.*

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 108P is recommended.*

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; Mathematics 1C or 2C; Cognitive Science 18 or Computer Science and Engineering 62AB or Computer Science and Engineering 65.*

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.*

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. (Course previously offered as Cognitive Science 108C, Cognitive Science 188B, and Psychology 188B.) *Prerequisites: Cognitive Science 108P 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 108A and 108AL and their prerequisites.*

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.*

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 (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, robotics, 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 performance. 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.

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).

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.*

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, Third College
(619) 534-4410

Professors

Michael Cole, Ph.D.
Yrjö Engeström, Ph.D.
Helene Keyssar, Ph.D.
Chandra Mukerji, Ph.D.
Herbert I. Schiller, Ph.D., *Emeritus*
Michael Schudson, Ph.D.

Associate Professors

Susan G. Davis, Ph.D.
Dee Dee Halleck
Daniel Hallin, Ph.D.
Robert Horwitz, Ph.D., *Chair*
Carol Padden, Ph.D.
Vicente Rafael, Ph.D.
Daniel Schiller, Ph.D.
Harley Shaiken, B.A.

Assistant Professors

Philip E. Agre, Ph.D.
William Drake, Ph.D.
Valerie Hartouni, Ph.D.
Olga A. Vasquez, Ph.D.

Lecturer with Security of Employment

Claudio Fenner-Lopez, M.A.

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. Though the emphasis of the major is not a technical one, the faculty in the Department of Communication believes 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, theater performance, or computer communication.

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.

The communication major offers an excellent preparation for teaching in the elementary and secondary level 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.

To gain a deeper understanding of the communicative forces that affect their everyday lives, students will have the opportunity to explore a variety of media, including video, print, performance, or computer communication media. 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 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: Integrative 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

RESIDENCY REQUIREMENT

Com/Gen 20, Com/Gen 21, Com/Cul 100, Com/Gen 100, Com/HIP 100, and Com/SF 100 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)

*These courses must be taken at UCSD.

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, and Com/MP 122 may not be used as electives within the minor.

THE GRADUATE PROGRAM

The Department of Communication 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. Historically, this department grew out of an interdisciplinary program jointly sponsored by the Departments of Drama (currently, Theatre), Political Science, Psychology, and Sociology. It is related by sympathy and interest to the mass communication programs, but not by kinship. 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. Spe-

cial 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 (not open to first-year students).
7. First-Year 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 sub-fields 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:

Yrjö Engeström

Faculty Undergraduate Adviser:

To be appointed

Undergraduate Coordinator:

To be appointed

Graduate Coordinator:

Jamie Lloyd

Courses

LOWER DIVISION

■ GENERAL COMMUNICATION

Com/Gen 20. Introduction to Communication (4)

An historical introduction to the ways in which the means of communication structure human activity. In addition, the idea that the nature of communication is conditioned by the medium of communication will be explored in terms of major theories of information processing, interpersonal interaction, and political-economic power. Staff

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." Keyssar

UPPER DIVISION

■ COMMUNICATION AS A SOCIAL FORCE

(Media methods courses are numbered 101-120.)

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 media persuasion and social effects. Considers critical and administrative communication the-

ories, the evolution of media delivery systems, and content and media research findings. *Prerequisite:* Com/Gen 20. Staff

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. Fenner-Lopez

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. Fenner-Lopez

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. Fenner-Lopez

Com/SF 117. Political Drama as Communication (4)

This course will examine plays by black Americans, British and American women, and Asian dramatists in order to explore theater as a central mode of communication of and to particular political and ethnic communities. We will analyze and compare both historical and aesthetic problems that are particular to black dramatists and female dramatists in their attempts to accurately reflect and affect cultural values and behavior. Emphasis will be placed on black and feminist plays in twentieth-century America; the course will conclude with a brief study of modern theater in China as one attempt to communicate the values of a society through artistic form. *Prerequisite:* Com/SF 100 or consent of instructor. Staff (Not offered in 1993-94.)

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. Drake

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 industrialized, developing, and communist countries. *Prerequisite:* Com/SF 100, Com/SF 120, or consent of instructor. Drake

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.* Drake

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.* Hallin

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.* Staff

Com/SF 128. Information Technology: Culture, Society, Politics (4)

An analysis of recent developments in telecommunications and computer 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 "postindustrial society." The impact of information technology on industry, work, skill, and stratification politics and culture will be considered. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

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.* Schudson

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. Basic First Amendment law is analyzed through the consideration of key cases and decisions in historical context. A major focus is the law of mass communications, examining the different legal treatment accorded print, broadcasting, and common carriers. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

Com/SF 147. Information Technology and Global Production (4)

Examines the role of computers, automation, and telecommunications on a new international division of labor. Analyzes the factors propelling and constraining the shifts of production between developed and developing countries, especially the role of labor relations, skill, industrial infrastructure, and trade policy. *Prerequisite: communication major or consent of instructor.* Shaiken

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.* Shaiken

Com/SF 149. Images of Work (4)

Explores the portrayal of work in novels, film, and other media in the twentieth-century United States. The focus is on how ideas about work have been influenced by technology, economic forces, and social movements. *Prerequisite: Com/SF 100 or consent of instructor.* Shaiken

Com/SF 150. Automobile and American Society (4)

This course uses the basic perspectives of communication to analyze the impact of the development and use of the automobile on U.S. society. The course focuses on three interrelated areas: the development of mass production, mass consumption, and mass transportation. *Prerequisite: Com/SF 100, or consent of instructor.* Shaiken

Com/SF 165. U.S. Soviet Communication in the Nuclear Age (4)

This course examines some of the ways that the U.S. and the Soviet Union communicate with each other using face-to-face communication, the standard media, and new electronic techniques. Special emphasis is given to a particular topic or technique each quarter that the course is offered. *Prerequisite: Com/SF 100.* Staff (Not offered in 1993-94.)

Com/SF 171A-B. American News Media (4-4)

(Same as Sociology 165 and Pol. Sci. 1021.) 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.* Hallin

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.* Staff

Com/SF 178. Mass Communications: Theories, Perspectives, and Methods (4)

This course in communication theory and methodology looks at various major schools of thought concerning the role, power, and effects of mass communications in modern society. We examine how the traditional "media effects" literature, critical theory, uses and gratifications research, cultural studies research, semiotics, and hermeneutics. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz

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.* Staff

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.* Staff

Com/SF 183. History of Communication Technologies (4)

This course will cover the development of the major mass communications technologies: printing, photography, telegraph and telephone, film, radio, and television. Particular attention will be paid to the telegraph/telephone and broadcast media because a major focus of the course is to analyze the relationship between communication technologies and macroeconomic structures. It is hypothesized that the telegraph/telephone fosters decisive organizational changes in the patterns of capitalist economic production; radio/television fosters decisive social changes in the patterns of consumption. Each of these technological developments will be analyzed in terms of broader pat-

terns of technological innovation in their respective periods of history. There will be some emphasis on the history and evolution of the American Telephone and Telegraph Company (AT&T). Finally, uses of these technologies will be analyzed for the changes in patterns of communication that they create. *Prerequisite: Com/SF 100 or consent of instructor.* Horwitz, Mukerji

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.* Staff

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.* Mukerji

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.* Mukerji

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.* Schiller

■ **COMMUNICATION AND CULTURE**

(Media methods courses are numbered 101-120.)

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.* Davis, Keyssar

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.* Halleck

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 cre-

ate an ensemble, a live dramatic production, and collaborate on a video production. *Prerequisites: Com/Gen 21 and Com/Cul 100 or consent of instructor.* Halleck

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. *Prerequisites: Com/Cul 100 and Com/Gen 100 or consent of instructor.* Staff

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).* Hallin, Schudson

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.* Keyssar

Com/Cul 114. American Theatre on Film (4)

Extensive examination of major plays from the modern American theatre that have been recorded on film or video. The class will study developing American dramatic themes. American drama as a central mode of communication of the American mythos, and the shaping of American theatre art as a unique twentieth-century cultural phenomenon. Students will attend film screenings and participate in scene presentations from the plays studied to facilitate discussion of these plays as performance. Discussions of the films as interpretations of the plays and comparison of live theatre and film as means of communicating the central strategies of American drama. *Prerequisites: Com/Cul 100 (Com/Gen 21 recommended) or consent of instructor.* Keyssar (Not offered in 1993-94.)

Com/Cul 115. The Theatre of Private Life: Family and Friends (4)

A close examination of theatre involving a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisites: Com/Cul 100 (Com/Gen 21 recommended) or consent of instructor.* Keyssar (Not offered in 1993-94.)

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.* Keyssar

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.* Davis

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.* Keyssar

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.* Davis

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.* Davis

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.* Davis

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.* Davis

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.* Schudson/Houston

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.* Hartouni

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.* Hartouni

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.* Hartouni

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.* Staff

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.* Cole

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.* Agre, Davis

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.* Hartouni

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.* Staff

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 Sociol. 1A or consent of instructor.* Mukerji

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 Sociol. 1A or consent of instructor.* Mukerji

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 Sociol. 1A or consent of instructor.* Mukerji

Com/Cul 169. 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. *Prerequisite: Com/Cul 100 or consent of instructor.* Schudson

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.* Schudson

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.* Schudson

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.* Staff

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.* Rafael

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.* Rafael

Com/Cul 181. Colonialism and Culture (4)

Colonial and postcolonial societies have been historically characterized by the radical redrawing of social boundaries brought about by processes of domination, resistance, and often ambiguous appropriations. What does it mean to speak of culture and communication under such conditions? How are questions about narrative and political authority, modernity and civilization, raised by Western encounters with non-Western people? And how do such matters as tradition, identity, and transformation reworked by indigenous and newly emergent groups within colonial societies function? Finally, what role does nationalism play in determining the limits and possibilities of colonial discourse? *Prerequisite: Com/Cul 100 or consent of instructor.* Rafael

■ COMMUNICATION AND HUMAN INFORMATION PROCESSING

(Media methods courses are numbered 101-120.)

Com/HIP 100. Introduction to Communication and the Individual (4)

A good deal of scholarship concerning the interaction of human beings with various means of communication suggests that different media permit or promote differently structured messages. A wide variety of claims concerning media-individual interactions are made—beginning with suggestions that language affects thought through claims about the consequences of literacy to suggestions about the influence of electronic media on individual and group behavior. This course will teach the student how to analyze such claims by examining the kinds of data on which they are based and current techniques in the social sciences for their evaluation. *Prerequisite: Com/Gen 20 or consent of instructor.* Cole, Padden

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. *Prerequisite: Com/HIP 100, Com/Gen 21, Com/SF 101A-B, or consent of instructor.* Halleck

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: communication major or consent of instructor.* Padden

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.* Cole

Com/HIP 112. Frontiers of Communication (4)

This class will explore, through directed study, small group and individual, the ways in which computers figure in communication and the networks through which these communications flow. The class makes use of campus based UNIX computer systems to set up, use, explore, and extend network communications and to provide computer help to off-campus sites used by other communication students. Students are expected to discuss the theoretical aspects of their projects in mid-term and final papers. *Prerequisites: HIP 100 and HIP 111, communication major or consent of instructor.* Cole

Com/HIP 114. Bilingual Communication (4)

This course is designed to introduce students to recent research techniques in bilingual communication. Students will begin by analyzing the results of recent research on bilingual and monolingual interactions in different settings. The course will then turn to methods of assessing the processes and strategies of communication. These activities will primarily include observations of video-taped bilingual and monolingual communicative interactions in classrooms and tutorial lessons in the analysis of video tape records of such interactions. *Prerequisites: Com/HIP 100 and Com/Gen 21 or consent of instructor.* Staff

Com/HIP 116. Practicum in Child Development (4)

(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. *Prerequisites: Com/HIP 100 or consent of instructor.* May be repeated three times for credit. Cole

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.* Cole

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. During the first quarter students will visit community settings in San Diego (especially settings involved in teaching literacy skills) and identify a specific area of study (e.g., community or parental attitudes toward the use of two languages to instruct in schools). As they focus on the problem they will study the different methods of research (survey, participant ob-

ervation, etc.). Evaluation will be by exams and a final paper. These papers will be used as a preliminary proposal for the second-quarter project. During the second quarter students will carry out the study proposed during the first quarter. Evaluation will be by close supervision of the students' research techniques and the final research project. *Prerequisite: Com/HIP 100 or consent of instructor.* Staff

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. *Prerequisites: Com/HIP 100 or consent of instructor.* Padden

Com/HIP 133. Language in Science and Technology (4)

Survey of the special uses of language in science and technology using ideas from linguistics, rhetoric, and sociology. Special emphasis on professional skills such as reading, interviewing, writing, and archival work. Term projects will be designed to employ these skills. *Prerequisite: Com/HIP 100 or consent of instructor.* Agre

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. *Prerequisites: communication major or consent of instructor.* Padden

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.* Keyssar

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: communication major or consent of instructor.* Padden

Com/HIP 171A,B,C. Advanced Computer Networking (4)

This is a project-oriented course designed to provide advanced skills in the use of computers as interactive communications media. Each quarter, in addition to reading texts and articles about theory and applications of computer networking, students are required to complete a project on computer networking. The project requires demonstrated ability to construct a new form of computer mediated communication and to evaluate its effectiveness using appropriate analytic techniques. *Prerequisites: Com/HIP 100, Com/HIP 111, communication major or consent of instructor.* Cole

tiveness using appropriate analytic techniques. *Prerequisites: Com/HIP 100, Com/HIP 111, communication major or consent of instructor.* Cole

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.* Staff

■ **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. *Prerequisite: Com/Gen 20 and Com/Gen 21.* Mukerji

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.* Staff

Com/Gen 150. Integrative Seminar in Communication (4)

A major goal will be to assist the student in integrating information about communication phenomena which are ordinarily considered as discrete topics, showing how individual behavior and social phenomena interact, and how these interactions are conditioned by dominant means of communication. It will reexamine the fundamental issues to which students were exposed in the introductory course and in their core courses. These issues center on the ways in which the means of communication mediate human behavior at different levels of social interaction for different purposes. Each of the major means of communication—language, writing, print, radio, television, and film—will be the subject of a two-week long "subunit." For each subunit students will discuss the social conditions under which the medium arose in the course of human history and is used in the modern world, the key features of the process of communication in each medium, and the consequences for society and the individual of some aspect of current social practices. *Prerequisite: SENIOR communication majors only or consent of instructor.* Staff

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.* Staff

Com/Gen 195. Instructional Assistance in Communication (4)

Observation and critique of classroom procedures and content. Assisting in the instruction of a lower-division undergraduate

communication course under the supervision of a faculty member. May be taken twice for credit. (P/NP grades only.) *Prerequisites: attendance in course in a previous quarter and a grade of B or better, and consent of instructor.* Staff

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. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100, and consent of instructor.* Staff

Com/Gen 199. Independent Study (4)

Independent study and research under the direction of a member of the staff. (P/NP grades only.) May be taken three times for credit. *Prerequisites: Com/SF 100, Com/Cul 100, Com/HIP 100, and consent of instructor.* Staff

■ **MEDIA PRODUCTION COURSES**

(The following courses may only be used as an elective in the major.)

Com/MP 122. Television as a Social Force (4)

Primarily a research and production course. Students undertake the research, design, and production of a series of videotaped programs that serve some pressing social need. *Prerequisite: Com/SF 101B or consent of instructor.* Fenner-Lopez (Not offered in 1993-94.)

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. Hallin, Schiller

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. Davis, Keyssar

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. Cole, Padden

Comm 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. Cole, Hallin

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.* Davis, Mukerji

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.* Padden, Vasquez

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. Rafael, Schudson

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. Schiller, Drake

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, Bakhtin, Eco, de Lauretis, White, and Barthes. Keyssar, Hartouni

Com 205. Mass Communication: Theories of Analysis (4)

This course centers on power and the special role of mass media in modern society. The course will investigate the assumptions a theorist employs in order to assess media power; it will inquire how a theorist "measures" the effects of mass communication on individuals or on society as a whole. It will examine the major schools of mass communication theory. Horwitz

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. Staff

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 informa-

tion and unequal roles and needs of developed and developing economies. Staff

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. Horwitz

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.* Drake

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. Schudson

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. Halleck

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. Schudson

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. Schudson

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. Mukerji

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. Keyssar

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. Cole, Keyssar

Com 260. Language and Human Communication (4)

Introduction to analysis of structure and content of human language communication. Differences in communicative styles among different culture groups will be compared and contrasted. Situations resulting in communication breakdown such as interethnic miscommunication and cases of language pathology (schizophrenia and language delay) will be examined as a technique for understanding properties of human communicative systems. Padden

Com 261. Advanced Seminar in Mediatonal 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.* Cole

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. Cole

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.* Staff

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. Staff

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. Schiller, Horwitz

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. Staff

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. Staff

Com 299. Independent Graduate Study (1-12)
Advanced independent study in communication under the guidance of Department of Communication faculty. Staff

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. Staff.*

▼ **C**OMPARATIVE STUDIES IN LANGUAGE, SOCIETY, AND CULTURE

OFFICE: 3354 Literature Building
534-3826/534-3217

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.

▼ **C**OMPUTER SCIENCE AND ENGINEERING (CSE)

See Engineering, Division of.

▼ **C**ONTEMPORARY BLACK ARTS PROGRAM

OFFICE: Third College Administration Bldg.,
Room 120

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, 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 5. Introduction to Black Drama (4) (W)

Literature/English 17. Introduction to Afro-American Literature (4) (S)

Music 127A. Music of Black Americans (4) (W)

2. A fourth lecture course selected from the following approved list:

Theatre 165. Modern Black Drama (4) (S)

Literature/English 185. Themes in Afro-American Literature (4) (F)

Literature/English 188. Contemporary Caribbean Literature (4) (F)

Literature/Writing 100. Beginning Fiction (4) (F)

Music 126. Introduction to Oral Music (4) (F)

Music 127B. Music of Black Americans (4) (S)

History/U.S. 135. Slavery and the Atlantic World (4) (W)

History/U.S. 136. Slavery and Freedom in Nineteenth-Century U.S.: Images and Reality (4) (S)

Writing 102. Poetry (4) (F,W,S)

Writing 120. Personal Narrative (4) (F)

VA 1. Introduction to Art (4) (W,S)

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 125. Dances of the World (4) (F,W)

Theatre 120. Theatre Acting Ensemble (4) (W)

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.

▼ **C**ONTEMPORARY ISSUES

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

Director

Patrick J. Ledden, Ph.D.

In addition to the current range of 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

2. Seminars (Titles and Topics Vary) (2,3,4)

Seminars directed by members of the UCSD faculty and visiting professors and treating in depth one contemporary issue or small group of related issues. (Consult the *Schedule of Classes* for possible offerings.) (F,W,S)

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

30A. Environmental Issues: Natural Sciences (4)

This course 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 includes air and water pollution, climate modification, solid waste disposal, hazardous waste treatment, and environmental impact assessment. *Prerequisite: None.* P.C. Chau (F)

30B. Environmental Issues: Social Sciences (4)

This course explores contemporary environmental issues from the perspective of the social sciences. It will include 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.* F.J.P. Poole (W or S)

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 universities. 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.)

134. The Cultures of Mexico (4)

(Same as ANRG 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. L. Ross

DIMENSIONS OF CULTURE

OFFICE: Third College, TCHB 132

Program Coordinator

Assistant Program Coordinator

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 Third 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 Third College first-year students must complete this three-course sequence. Transfer students should see their col-

CULTURAL TRADITIONS

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

Director

Patrick J. Ledden, Ph.D.

Each year a faculty committee develops interdisciplinary three-course sequences. The particular cultures to be studied may vary from year to year, though some, such as the Judaic culture studies sequence, have attracted such widespread interest that they may be carried over from one year to the next. Other sequences have been offered in such cultures as Asian, Latin American, Mediterranean, Chicano, and American Indian.

A descriptive list of the sequences offered for the coming academic year is available in time for the fall enrollment. Inquiries about the program or projected sequences may be addressed to staff in Room 2024 of the Muir College Humanities and Social Sciences Building.

Courses

1A-B-C. Cultural Traditions (4-4-4)

A three-quarter sequence involving the study of the deep and surface structures of the lifestyle of one specific culture. The approach from several disciplines addresses itself to analyses of the social, political and economic institutions, the aesthetic structuring through formal artistic expression, and the cultural forms of everyday living. (F,W,S)

lege academic adviser regarding the appropriate course requirements.

For further details on Third College requirements, see "Third 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 Third 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 Third 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 Third College students only. (Letter grade only.) *Prerequisite: completion of Subject A requirement.* (S)

▼ EARTH SCIENCES

OFFICE: 1512 Galbraith Hall, Revelle College
(See also "Scripps Institution of Oceanography.")

The *UCSD Interdisciplinary Earth Sciences Undergraduate Program* is a transition program between the Physics/ES and Chemistry/ES specialization programs, which have been offered since 1968, and a proposed earth sciences department, to be implemented at a future time.

It should be kept in mind that both the chemistry/earth science major and the physics/earth science major will continue to exist. These programs emphasize chemistry and physics, respectively, with specialization in the earth sciences. Students currently enrolled in these programs will therefore have a choice between completing their education under the conditions described in the physics and chemistry catalog chapters, re-

spectively, or transferring to the new earth sciences major program, if the requirements can be satisfied.

The program offers an earth sciences major leading to a B.S. degree, with emphasis on the quantitative aspects of the field and a broad formation rooted in fundamental physics and chemistry, in addition to a modern earth sciences curriculum. 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 well complemented by various minors ranging from mathematics, physics, or chemistry, to biology, environmental science, or public policy and political science. 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. As a guiding concept, the focus of the earth sciences curriculum is placed on the evolution of the Earth system, and on the energetics and dynamics of this evolution.

It should be noted that the program is still under development, and that some courses are still in the process of being defined and developed. For example, environmental geochemistry, biogeochemistry, global geochemical cycles, are course concepts that required further preparation before they can be offered. Similarly, physics of the earth interior and advanced seismology are concepts under development. Descriptions for such courses will appear in future editions of the catalog. In some cases, interested students have the option to take graduate courses touching on these topics, after consulting with the program coordinator, and with the consent of the instructors.

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. A grade-point average of 2.0 or higher in the upper-division major program must be achieved for graduation. All courses (lower- and upper-division) required for the major must be taken for a letter grade.

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 planetary-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. Math. 2A, 2B, 2C, 2D
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

**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 141A. Organic Chemistry
3. Chemistry restricted electives: minimum of 16 units selected from:
Chemistry 141B, C. Organic Chemistry
Chemistry 143A, B. Organic Chemistry Lab
Chemistry 130, 132. Physical Chemistry
Chemistry 105A, B. Physical Chemistry Lab
Chemistry 106. Instrumental Analysis Lab
Chemistry 120B, C. Inorganic Chemistry
Chemistry 122. Biochemical Evolution
Chemistry 149A. Environmental Geochemistry
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 150. Igneous and Metamorphic Petrology
ES 153. Interpretation of the Sedimentary Record
ES 155. Geological Record of Planetary Evolution
ES 160. Tectonics and Structural Geology

Students may wish to incorporate a small portion of the major program into their lower-division course load. For example, Chemistry 120A, Chemistry 141A.

A possible schedule yields:

FALL	WINTER	SPRING
JUNIOR YEAR		
Chem. 141A	Chem. 131	ES 120
Chem. Elect.	Chem. Elect.	ES 103
ES 101	ES 102	ES Elect.
—	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 aspects of the Earth. Emphasis is placed on a solid background

of fundamental physics, from mechanics and electromagnetism to continuum- and quantum mechanics, and on the necessary mathematical skills. The major introduces basic techniques used to investigate the internal structure of the Earth, from seismology to the study of potential fields, and space geodesy. Elementary geodynamics, including the physics of simple convective systems, introductory rock mechanics, and plate kinematics are among topics introduced. At the same time, a "hands on" exposure to field problems and techniques will be accessible through a Natural Resources and Field Geophysics sequence.

**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 2DA-EA-F, or 2DH, EH, FH
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

**UPPER-DIVISION
REQUIREMENTS**

The following courses must be taken for a letter grade:

1. Earth sciences requirements:
ES 103. Introduction to Geophysics
ES 130. Geodynamics of Terrestrial Planets
2. Physics requirements:
Physics 100A-B-C. Electromagnetism
Physics 110A-B. Mechanics
3. Physics restricted electives: minimum of 4 units selected from:
Physics 150. Continuum Mechanics
Physics 140A, B. Statistical and Thermal Physics
Physics 105. Computational Physics
4. Mathematics restricted electives: minimum of 8 units selected from:
Mathematics 110. Partial Differential Equations
Mathematics 102. Linear Algebra
Mathematics 120A, B. Complex Analysis
Mathematics 183. Statistical Methods
5. Earth sciences restricted electives: at least 12 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 155. Geological Record of Planetary 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 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. 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.	—

EARTH SCIENCES MINOR

A minor in Earth Sciences consists of three lower division courses, such as ES 10, ES 12, ES 20, ES 30, ES 40, (except ES 45) 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. 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.

EARTH SCIENCES GRADUATE PROGRAM

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.

Courses

NOTE: The program will endeavor to offer the courses outlined below. However, un-

foreseen 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, 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 (W)

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 CO₂ 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. *Prerequisites: freshman physics and chemistry, and any basic earth science course.* W. Berger and SIO staff (S)

ES 45. From Mythology to Modern Earth Sciences (4)

Introduction to selected geological phenomena that are the subject of both scientific study and of myth, bringing out the difference in the scientific approach to prescientific knowledge about natural processes, and the gradual emancipation of geologic thinking from its nonscientific origins. Discussion involves three types of topics: the present ruling paradigm of ge-

ology (plate tectonics), the history of geology, and selected examples of myth (e.g., the Sumerian flood legend, Plato's story of Atlantis, Hawaiian legends of Pele, and Icelandic myths regarding the origin of the world). *Prerequisites: basic background in science and history.* W. Berger, Y. Bentor, and SIO staff (W)

UPPER DIVISION

ES 101. Introduction to Geology (4)

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, and 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 man on the environment. *Prerequisite: ES 101, first-year Revelle chemistry, math., and physics or equivalent, 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, isostasy, and elementary concepts in geodynamics. The course summarizes current knowledge of the interiors of the Earth as determined by modern geophysical techniques. *Prerequisites: Math. 2; Phys. 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.* (S)

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: Math. 2; Phys. 2, or consent of instructors.* Minster, Phipps-Morgan, and SIO staff. Offered in alternate years (1993-94). (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 H₂O, CO₂, and CH₄ 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. Offered in alternate years (1992-93). SIO staff (S)

ES 144. Isotope Geochemistry (4)

Isotopic ratios of various elements serve as natural tracers, as chronometers, and as geothermometers. Thus isotope measure-

ments 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.* (S)

ES 150. Igneous and Metamorphic Petrology (4)

Physical, chemical, and mineralogical properties of igneous and metamorphic rocks. Emphasis is on the origin and genetic relationships as interpreted from field occurrences, theoretical studies, and experimental data. *Prerequisites: ES 101, ES 102, ES 120.* Hawkins (S)

ES 153. 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, ES 120, or consent of instructor. To be taken preferably after ES 150.* (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 150 or consent of instructors.*

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 (1993-94). (W)

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: Math. 2 sequence, Phys. 2 sequence. ES 103, 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

ECONOMICS

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problem that can be solved by geophysical experiments. Computer-aided data analysis and interpretation. *Prerequisites: ES 103, 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

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OFFICE: 114 Economics Building

Professors

Richard Attiyeh, Ph.D.
Donald V.T. Bear, Ph.D.
George Borjas, Ph.D.
John Conlisk, Ph.D.
Vincent Crawford, Ph.D.
Robert F. Engle, Ph.D., *Chair*
Clive W.J. Granger, Ph.D.
Theodore Groves, Ph.D.
James D. Hamilton, Ph.D.
Walter P. Heller, Ph.D.
Mark J. Machina, Ph.D.
Ramu Ramanathan, Ph.D.
Michael Rothschild, Ph.D.
Joel Sobel, Ph.D.
Ross Starr, Ph.D.
Halbert White, Ph.D.

Associate Professors

Richard Carson, Ph.D.
Marjorie Flavin, Ph.D.
Jose Luis Guasch, Ph.D.
James Rauch, Ph.D.
Dennis Smallwood, Ph.D.
Maxwell Stinchcombe, Ph.D.

Assistant Professors

Julian Betts, Ph.D.
Wouter J. Den Haan, Ph.D.
Andrew T. Levin, Ph.D.
Alfredo Pereira, Ph.D.
Garey Ramey, Ph.D.
Valerie Ramey, Ph.D.
Lakshmi Raut, Ph.D.
Glenn Sueyoshi, 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.

INTRODUCTION

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 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.

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.

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.

THE UNDERGRADUATE PROGRAM

LOWER-DIVISION ECONOMIC COURSES

A first survey course—Economics 10

Economics 10 is an elementary and non-technical 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 new and therefore somewhat experimental. It was first offered in winter 1993 (after this catalog copy was written). The department expects the course to be successful and to be regularly offered in the future. However, there can be no promise at this time.

There is no plan to make Economics 10 a formal requirement for further courses or for minors or majors. However, the faculty expect that Economics 10, once it is well established, will be recommended for most students who intend a minor or major in economics. 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. The one exception is the upper-division accounting course.

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 QEDS 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.

Applications—Economics 1C and 2C

Though a micro-macro combination (such as Economics 1A-1B) is an acceptable introductory package for upper-division work, most students are well advised to complete a whole year (three quarters) of introductory economics. In the past, this has been done by taking an applications course, Economics 1C or Economics 2C, after taking a micro-macro combination. So students have taken three-quarter A-B-C packages such as Economics 1A-1B-1C, 2A-2B-2C, 1A-2B-1C, and so on. Economics 1C and 2C differ only in that the latter uses calculus in the presentation; for this reason, a student may not receive credit for both Economics 1C and 2C.

Three-quarter packages like Economics 1A-1B-1C will continue to be available at least through the end of the 1992-93 school year. However, if the Economics 10 course described above turns out to be as successful as planned, then Economics 1C and 2C will probably be phased out. Students of the future will probably take three-quarter sequences like Economics 10-1A-1B and 10-2A-2B rather than like Economics 1A-1B-1C and 2A-2B-2C. That is, Economics 10 will replace Economics 1C or 2C as a student's applications course, and the applications course will precede rather than follow the micro and macro courses.

A student may not take Economics 1C or 2C after taking upper-division economics; credit will not be given. However, Economics 1C or 2C may be taken simultaneously with the first upper-division economics course.

ACCOUNTING COURSES

The department offers two accounting courses, Economics 4 and Economics 173. The former is prerequisite for the latter. The courses have no other prerequisites, and they are not prerequisite for any other courses. The courses can be used as optional parts of an economics or QEDS major or of an economics minor; and the courses are open to students who take no other courses from the department.

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 major is designed to provide a broad understanding of modern economics. Both the tools of economic analysis and their application to contemporary problems are stressed.

A student majoring in economics must meet the following requirements:

1. Calculus. Mathematics 1A-1B-1C or Mathematics 2A-2B-2C.
2. Lower-division economics. Economics 1A-1B, or 2A-2B or 1A-2B or 2A-1B.
3. Introductory statistics and computer use. Social Science 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

Math. 1A-B-C or Math. 2A-B-C

SOPHOMORE YEAR

Econ. 1A-B or Econ. 2A-B
or Econ. 10-1A-1B or Econ. 10-2A-2B
Soc. Sci. 60

JUNIOR YEAR

Econ. 100A-B
Econ. 110A-B
Econ. 120A-B

SENIOR YEAR

Six Econ. Electives

A fuller description of the economics 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. 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 2A-2B-2C-2EA.
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. Social Science 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, Math. 71, Math. 77.)
4. Upper-division core. Economics 170A-B (microeconomics), Economics 120A-120B-171 (econometrics and decision theory), 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

Math. 2A-B-C

SOPHOMORE YEAR

Econ. 2A-B or 10-2A-2B
Math. 2EA
Soc. Sci. 60

JUNIOR YEAR

Econ. 170A-B
Econ. 120A-B
Econ. 171
Econ. 172A-B-C

SENIOR YEAR

Seven Econ. Electives

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 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).

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.

Regarding Warren College programs of concentration, students should see Warren academic advisers.

THE GRADUATE PROGRAM

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 pre-

pare 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-C. Elements of Economics (4-4-4)

Elementary theories of resource allocation, income determination, and economic policy. 1A is not required for 1B, but both 1A and 1B are required for 1C. Credit not allowed for both Econ. 1A-B-C and Econ. 2A-B-C.

2A-B-C. Introduction to Economics (4-4-4)

Same content as Economics 1A-B-C, but calculus is used in the presentation. 2A is not required for 2B, but both 2A and 2B are required for 2C. Credit not allowed for both Econ. 1A-B-C and Econ. 2A-B-C. *Prerequisites: Math. 1A-B-C.*

4. Financial Accounting (4)

Recording, organizing, and communicating economic information relating to business entities.

10. Markets (4)

Introduction to markets in the American economy. Market structure and role in allocating resources; government intervention when markets fail (monopoly, inequality, environmental issues); stock, bond, and other financial markets; inflation and unemployment; international markets. Emphasis on intuition and application to current events. 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 Econ. 100A-B and Econ. 170A-B. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Math. 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)

Analysis of the causes and patterns of international trade and investment, of the scope for increasing national welfare through foreign trade and investment, and of the policies for realizing those gains and for distributing them internationally. *Prerequisite: Econ. 100B or 170B.*

103. International Monetary Relations (4)

Balance of payments, international capital movements, and foreign exchange examined in light of current theories, policies, and problems. *Prerequisites: Econ. 110B.*

105. Industry Organization and Public Policy (4)

Study of the structure and performance of American industry. Dimensions and determinants of market structure and performance, empirical evidence. Anti-trust laws, regulation of industry, and other aspects of public policy toward industry. *Prerequisite: Econ. 100B or 170B.*

107. Topics in Industrial Organization (4)

Extension of topics covered in I.O. courses, particularly regulation of companies and industries, effects of deregulation on industries such as airlines, telecommunications, broadcasting. *Prerequisite: Econ. 100A.*

109. Game Theory (4)

Introduction to game theory. Applications to such topics as oligopoly, bargaining, contracts, and market interactions. *Prerequisites: Math. 2C and either Econ. 100B or Econ. 170B.*

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: one introductory microeconomics course, one introductory macroeconomics course, and Math. 1A-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: Econ. 110A-B.*

112. Advanced Monetary Economics (4)

Sequel to Economics 111. *Prerequisite: Econ. 111.*

113. Mathematical Economics (4)

Mathematical concepts and techniques used in advanced economic analysis; applications to selected aspects of economic theory. *Prerequisites: Econ. 100B or 170B and Math. 2C.*

115. History of Economic Thought (4)

Evolution of economic analysis over the last three centuries. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

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: one introductory microeconomics course and one introductory macroeconomics course.*

117. Economic Growth (4)

Models of the economic growth of developed economies. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Math. 1A-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, one introductory microeconomics course and one introductory macroeconomics course; 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. Regression and other methods commonly used in economics. Credit not allowed for both Econ.

120A and Math. 183. Also, see the "Note on overlaps" at the end of the undergraduate course descriptions. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, Math. 1A-B-C, and Social Science 60.*

120AH-BH. Honors Econometrics (4-4)

(Conjoined with Economics 120A-B.) Honors sequence covering the material of Economics 120A-B. *Prerequisites: Social Science 60 and 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: Econ. 120A-B. Econ. 120C and 178 are recommended.*

130. Public Policy (4)

Use of economics and related disciplines to study issues of public policy. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

131. Economics of the Environment (4)

Analysis of the causes of pollution (air, noise, water) and non-optimal utilization of certain resources (e.g., fisheries, wilderness areas, air) and of public policies to deal with these problems. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

132. Energy Economics (4)

Role of energy in the residential, industrial, and transportation sectors of the national and international economy. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

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: one introductory microeconomics course and one introductory macroeconomics course.*

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: one introductory microeconomics course and one introductory macroeconomics course.*

135. Urban Economics (4)

(Same as USP 102.)

Urban economic problems and public policies to deal with them. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

136. Human Resources (4)

Theoretical and empirical analysis of public and private investment in people, emphasizing the contribution to productivity of education. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

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: one introductory microeconomics course, one introductory macroeconomics course, and Economics 120A.*

138. 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: one introductory microeconomics course and one introductory macroeconomics course.*

139. Labor Economics (4)

Study of labor markets and related policy. Topics such as collective bargaining, labor force participation, labor mobility, effects of technical change. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course. Economics 100A-B or 170A-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: Econ. 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: Econ. 110A-B.*

150. Economics of the Public Sector: Taxation (4)

An analysis of the effects of government taxation on resource allocation and the distribution of income. The efficiency and equity of alternative forms of taxation. Optimal tax policies. Income redistribution through the fiscal process. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

151. Economics of the Public Sector: Expenditures (4)

An analysis of the effects of government expenditure policies on resource allocation and the distribution of income. Political and economic determinants of optimal public expenditure and investment policies. An introduction to cost-benefit analysis. *Prerequisite: Econ. 100B or 170B.*

152. Topics in Public Economics (4)

Special topics on the economics of the public sector. *Prerequisite: Econ. 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: Econ. 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. Introductory economics and U.S. history recommended. Economics 158A is not a prerequisite for Economics 158B.*

161. Latin American Economic Development (4)

Development issues facing Latin American countries. Economic policy. Emphasis on Argentina, Brazil, Chile, and Mexico. *Prerequisites: one year of lower-division economics.*

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. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

170A-B. QEDS 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 Econ. 100A-B and Econ. 170A-

B. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, and Math. 2C.*

170AH-BH. Honors QEDS 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 under uncertainty. Decision trees, payoff tables, alternative decision criteria, expected utility theory, and risk aversion. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, Econ. 120A-B, and Math. 2E or 2EA.*

172A-B-C. Introduction to Operations Research (4-4-4)

Deterministic and stochastic optimization techniques. Linear programming sensitivity, duality; integer programming; network models and related algorithms. Kuhn-Tucker theory, nonlinear programming algorithms. Dynamic programming in deterministic and stochastic contexts, queueing and inventory systems and related problems. 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. *Prerequisites: Math. 2E or 2EA, one introductory microeconomics course, and one introductory macroeconomics course. Econ. 120B is required for 172C.*

173. Managerial Accounting (4)

The structure of accounting systems, their underlying assumptions, and their use by management. Basic techniques for recording, summarizing, and evaluating organizational activity; the income statement and balance sheet. Cost accounting and use of accounting for internal control and decision making. *Prerequisite: Econ. 4.*

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: Econ. 120A-B and either 100A-B or Econ. 170A-B. Econ. 175 and Econ. 171 are recommended.*

175. Financial Decisions (4)

Financial decision making. Such topics as valuing assets, portfolio selection, and capital budgeting. *Prerequisites: one introductory microeconomics course, one introductory macroeconomics course, 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: one introductory microeconomics course and one introductory macroeconomics course, Econ. 120B.*

177. Topics in Operations Research (4)

Selected topics in operations research. *Prerequisites: Econ. 120A and Econ. 172A.*

178. Economic Forecasting (4)

Forecasting methods such as trend curves, time series techniques, use of expectations data, econometric models, and assorted low-cost approaches. *Prerequisite: one introductory microeconomics course, one introductory macroeconomics course, and Econ. 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: Econ. 100A-B or 170A-B.*

191. Senior Essay Seminar (4)

Senior essay seminar for students with superior records in department majors. *Prerequisite: department stamp required.*

EDUCATION ABROAD PROGRAM

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 Econ. 120A-B overlaps the subject matter of probability and statistics courses offered in other departments (Math. 180A-181A, for example); and the subject matter of Econ. 172A-B overlaps the subject matter of Math. 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: Econ. 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: Econ. 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: Econ. 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: Econ. 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: Econ. 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: Econ. 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.

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 Hutchison Way and Gilman Drive)

Robert Cancel, Literature, *Faculty Director*

David Woodruff, Biology, *Faculty Director*

Ed Reynolds, History, *Faculty Director*

Mary Dhooge, *Dean of International Education*

Kimberly Burton, *Assistant Director for Programs Abroad*

Molly Ann McCarren, *EAP Adviser*

Administered by the University of California, the Education Abroad Program (EAP) is now entering its twenty-ninth year of operation. Study Centers have been established in Australia, Austria, Brazil, Canada, Chile, China, Costa Rica, Denmark, Egypt, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Mexico, New Zealand, Norway, Russia, Spain, Sweden, Taiwan, Thailand, Togo, the United Kingdom. Most programs are for a single academic year, but shorter term/special focus programs are also offered in Brazil, Canada, Chile, China, Costa Rica, Denmark, Hungary, Indonesia, Italy, Japan, Korea, Mexico, Russia, 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.

PURPOSE

The Education Abroad Program was originally designed to give mature, highly motivated, and academically successful upper-division students

from all UC campuses rich experience in a new cultural milieu as a part of their normal undergraduate program. Somewhat later, a graduate dimension was added which has now made a significant contribution in assisting a small number of selected students in their progress toward advanced degrees.

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.

Most University of California financial aid is available to EAP students, including grants, scholarships, and loans. In addition, there are EAP Opportunity Grants for minority and economically disadvantaged students, EAP Alumni and General Scholarships, regional scholarships for European and most Pacific countries, other country-specific scholarships, and scholarships provided by the Friends of the International Center.

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, UCSD, and are given to students following a discussion of various aspects of the program with an EAP adviser. Information on deadlines and re-

lated matters such as course offerings, information sessions, selection, schedules of departures, and payment of fees may be obtained from the Programs Abroad Office at the International Center, UCSD. It is not too early to begin planning for a year abroad during one's freshman year. General group information sessions about the programs are held during Welcome Week and in October and January.

STUDY CENTERS

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, history, international relations, music, political science. A few business internships are available.

Denmark. No language prerequisite, but a summer intensive language program precedes the academic year and continues into the fall. Students may also participate in the summer language program at the first-year level and return the following summer to receive instruction at the second-year level; study in Denmark then continues for the full academic year at the University of Copenhagen. Of particular interest are courses in history, international relations, linguistics, political science, and Scandinavian language, literature, and folklore.

France. 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

EDUCATION ABROAD PROGRAM

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classes or (in the Paris program) take courses designed specially for EAP students. UC faculty directors are in residence at Bordeaux, Grenoble, and Paris.

University of Bordeaux. Targeted fields of study include anthropology, archaeology, art history, French literature, geography, history, international relations, and political science.

University of Grenoble. Courses are particularly strong in art history, developmental studies, French language and literature, history, international relations, linguistics, political science, and sociology.

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, developmental studies, French language and literature, geography, history, international relations, 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 Pau. Offerings are particularly strong in Basque studies, environmental/ecological studies, and French history/civilization, which is taught from the local and regional perspective. Substantial course work is also available in a range of humanities and social science fields.

University of Poitiers. The University of Poitiers is particularly strong in art history, French literature, language, and medieval studies.

University of Toulouse. Business/management studies, comparative literature, economics, international relations, and political science are targeted fields for EAP students.

Special Graduate Student opportunities in France are available at:

- *Ecole Polytechnique* in Palaiseau (outside Paris), for natural sciences and mathematics
- *Ecole Normale Supérieure-Paris*, for research in social sciences and economics
- *Ecole Normale Supérieure de Fontenay-St. Cloud* (outside Paris), for research and courses in literature and the humanities.

Germany. A compulsory intensive language program precedes the beginning of the academic year. All courses are taught in German. Tutorials may supplement courses in which several UC students are enrolled.

Georg-August University, Göttingen. Strong fields for EAP students include: business/management, economics, European studies, German language and literature, history, international relations, political science.

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.

Italy. 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, literary theory, and political science.

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. Art history, 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:

- *Il Bisonte International School of Graphic Arts, Florence*, offers practical training and courses for a very limited number of students with advanced preparation in the graphic arts.
- *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.
- *Venice Academy of Fine Arts.* Emphasis is on painting for UC students. Requires admissions examination.
- *Venice Institute of Architecture* provides excellent instruction in architecture, architectural

history, urban planning, conservation, and restoration.

Norway. Knowledge of Norwegian is not required, but a compulsory summer intensive course in Norwegian precedes the beginning of the academic year. Intensive language study is continued during the fall semester. All courses are taught in Norwegian, and tutorials can be arranged to supplement some courses.

University of Bergen. Of particular note are courses in art history, business and management studies, environmental/ecological science, psychology, and Scandinavian languages, literature, and folklore.

Norwegian School of Economics and Business Administration. Courses may be taken in English through the International Business Program.

Russia. *Alexander Herzen Russian Pedagogical University in St. Petersburg.* EAP offers a Russian language and culture program in fall and spring semesters to students with two to three years of Russian. For graduate students with advanced Russian language study, individual programs for study or research are available.

Northwest Centre for Government Service, St. Petersburg. A fall or spring semester program in Russian Society in Transition is offered. Strong preparation in Russian language and area studies required.

Spain. A compulsory intensive language program precedes the beginning of the academic year. All instruction is in Spanish.

University of Barcelona. Students take courses at the university as well as core courses sponsored by the study center. Strong fields of study are: ancient history/archaeology/paleontology, art history, biology, Catalan studies, economics, geography, history, Latin American studies, medieval studies, music, political science, Spanish language and literature. (This is a cooperative program with the University of Illinois.)

Complutense University of Madrid. Students take core courses taught by Spanish faculty and at least one regular university course. Of particular interest are art history, international relations, political science, and Spanish language and literature.

University of Grenada. Students can select from a variety of core courses in the humanities and social sciences, and at least one regular university course. Strengths are in North African studies, Middle Eastern studies, and Spanish language and literature.

University of Alcala de Henares. Students take regular university courses in almost any faculty, with economics, history, and literature being particularly strong.

Sweden. Compulsory intensive language course during the summer for students who are not already fluent in Swedish. Language study continues during the fall semester. 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, 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, University of Lancaster, University of Leeds, University of Sheffield, University of Sussex, and University of York.*

Ireland. *University College Cork, University College Dublin, University College Galway.*

Scotland. *University of Edinburgh, University of Glasgow, University of St. Andrews, University of Stirling.*

Wales. *University College of Wales, Aberystwyth.*

Generally, the host universities offer a broad curriculum that includes most liberal arts majors. Engineering, life sciences, and physical sciences are available.

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 precedes the beginning of the academic year.

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.

ASIA

India. Summer orientation and Hindi language study precede the academic year.

University of Delhi. Students enroll in regular university classes, and take a special proseminar on Indian culture and society. 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. *Beijing (Peking) University.* The purpose of the academic program is to improve the student's facility in spoken and written Standard Chinese and to enable students to gain an insight into Chinese society and culture. Eligibility requirements are a minimum of two years of Chinese language. Students with sufficient proficiency in Chinese may also audit or take regular university courses.

Students may teach English to Chinese students in exchange for room and board, while studying Standard Chinese and doing independent study. Requirements include two years of Chinese language and one course in teaching English as a foreign language.

Nankai University in Tianjin. A summer/fall program in Chinese language and literature is available for students with one year of university-level Chinese. Qualified students may petition to extend their studies for a second semester at either Nankai or Peking Universities.

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.

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, which is spring quarter only. Language requirements depend on the specific program. All the full-year programs (except IUC) 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).

Kyushu University (Fukuoka). This program is primarily for graduate-level economics students. Admission is based on the merit of the student's research project proposal. Two years of Japanese language are required.

Doshisha University (Kyoto). Primarily for undergraduates, the program consists of Japanese language and culture classes along with elective courses from regular university course offerings, taught in Japanese. Exams and papers may be written in English. Three years of university-level Japanese required.

Nagoya University (Nagoya). This program is for graduate-level economics students. Admission is based on the merit of the student's research project proposal. Two years of university-level Japanese required.

Osaka University (Osaka). Economics and engineering students with two to three years of Japanese may be placed at Osaka.

Tohoku University (Sendai). Study in Tohoku is primarily for graduate students in most fields with well-developed individual research projects. Technically it is also open to undergraduates who can follow lectures and manage reading assignments in Japanese. Two to three years of university-level Japanese is required, and, for graduate students, an acceptable research proposal.

International Christian University (Mitaka, Tokyo). Primarily for undergraduates, the academic program at ICU consists mainly of Japanese language and area studies, and international relations courses (offered in English). One year of university-level Japanese required.

Sophia University (Tokyo). Primarily for undergraduates, the program consists of Japanese language courses and courses taken in the Faculty of Comparative Culture (in English). One year of university-level Japanese required.

Inter-University Center for Japanese Language Studies (Yokohama). IUC offers an intensive program of training for graduate students in Japanese. It is designed to bring participants to a level of proficiency sufficient for academic or professional use. Two years of university-level Japanese required.

Meiji Gakuin University (Yokohama). Offered only in spring quarter, the Global Security and Development Studies Program consists of intensive study of peace and security issues. All instruction is in English. No language prerequisite.

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. Two academic programs are available to students: a summer plus fall program, and a full academic year program.

Summer Plus Fall Program. Gadjah Mada University, Yogyakarta. Students take language and special area studies courses on modern Indonesia and arts/culture (in English). If proficient in Indonesian, students may enroll in the fall in regular university courses.

Academic Year Program. After the summer and fall components, students pursue their particular academic interests in one of the following institutions: Gadjah Mada University, where anthropology, history, Indonesian language/literature are strong; *Indonesian Arts Institute in Yogyakarta*, which is known for art, dance, drama, and music.

Thailand. EAP offers three options: a summer language and society program, summer/fall semester program, and full academic year.

Summer Language and Society Program at Chiang Mai University. Consists of language study and an area studies course designed for the program.

Summer plus Fall. Additional language study and a southeast Asian history course follow the summer component.

Academic Year Program. If not yet proficient in Thai, students continue in a second term of language study and take a contemporary Thai issues course. Students with sufficient language proficiency may enroll in a wide range of regular courses 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.

Togo. A summer study and field experience program at the *Village du Benin Language Center in Lomé* consists of intensive French language study and an African studies course, followed by individual field projects in rural Togo. Prerequisites are completion of one year university work, good standing at UC, and one year of university-level French.

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 orientation in Manaus on the Amazon, intensive language study in Fortaleza, 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 economics, sociology (including anthropology and political science), geography, history, and literature.

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.

University of Chile, Santiago. Courses designed for EAP and taught in Spanish will focus on Chilean history and society, Spanish language, Latin American development, ecology/environment, women's studies. If staying for a second semester, students will take regular university courses, and/or work on a senior thesis or special project.

Costa Rica. There are three different programs:

Year Program. University of Costa Rica. 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 (Biology 160, 162, and an ecology lab) may study tropical biology in the rain forest of Monteverde. Previous Spanish is preferred.

Medical Quarter. A six-week program for fourth-year medical students in the winter quarter includes language, and community and family health clinical studies at the University of Costa Rica.

Mexico. EAP students in Mexico may study for a summer, a quarter, or an academic year. (The Mexico programs are currently under review, and may change.)

Year Program. Universidad Nacional Autonoma de México (UNAM). Two years of university-level Spanish are required. A compulsory intensive language program precedes the beginning of the academic year. Students take regular courses for

one or two semesters at UNAM. A research project may also be combined with one semester of classes to give a full year of academic credit.

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.

Study and Field Experience. The SFE program, offered in both fall and spring quarters, includes Mexican area studies and intensive language study at UNAM in Mexico City, and field studies in various parts of Mexico. Completion of two terms of university work and one year of university-level Spanish are required. The minimum GPA requirement is 2.5.

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; the University of New England in Armidale; 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 six universities in New Zealand: the University of Auckland, Lincoln University, University of Otago, Victoria University of Wellington, 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)* located outside of Vancouver. This aca-

democratic-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 Togo and Mexico Study and Field Experience programs); 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, Norway, 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

Robert Cancel, Literature, *Faculty Director*

David Woodruff, Biology, *Faculty Director*

Ed Reynolds, History, *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 at the International Center, 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.

ENGINEERING, DIVISION OF

OFFICE: 7301 Engineering Building, Unit I,
Warren College

The Division of Engineering at UCSD comprises the Departments of Applied Mechanics and Engineering Sciences (AMES), Computer Science and Engineering (CSE), and Electrical and Computer Engineering (ECE). The division is directed by the dean of Engineering. The departments offer many undergraduate curricula and graduate degree programs. Students interested in engineering should consult the individual department listings which follow this section of the catalog.

Student demand exceeds program capacity in several of the undergraduate majors in each department. **Applicants who have demonstrated excellent academic performance prior to being admitted to UCSD will be admitted directly into the engineering major of their choice.** Students not admitted directly into an engineering major can select a **pre-engineering major** and must consult the department of their choice and review the requirements necessary to gain admission.

The general-education requirements of UCSD's five undergraduate colleges differ noticeably. In some cases, these requirements can significantly 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.

PRE-ENGINEERING MAJORS

Until such time as they are admitted to an engineering program, students may indicate their interest in engineering by using one of the three pre-engineering major codes. Students should use the pre-engineering code of the department that contains the major that they intend to pursue, i.e., pre-AMES, pre-CSE, or pre-ECE.

ADMISSION TO MAJORS IN THE DIVISION OF ENGINEERING

Pre-engineering students should complete the following courses during their freshman year and apply for admission to an engineering major during the spring quarter of their freshman year:

1. Math. 2A, 2B, 2C
2. Physics 2A, 2B
3. Chemistry 6A or 7A (not required for the B.A. degree in CSE)

ENGINEERING: APPLIED MECHANICS AND ENGINEERING SCIENCES

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4. Any two additional courses in science, math, engineering. One of them must be engineering. In CSE, these two courses must be 62B (or 65) and 70.

Admission will be based on performance in these courses. A performance index is computed by averaging the grades received in the eight courses. While this subset of courses will be used for an admission decision, it is expected that pre-engineering students will follow the recommended curricula (given by the departments below) as much as possible, subject to their college requirements. It is expected that twelve to eighteen units of general education will also be completed in the first year.

Students who are not able to satisfy this application requirement, or who wish to reapply following denial, must do so by the end of their sixth quarter of study at UCSD. This sixth quarter admission review will examine the student's entire academic performance, especially weighing courses in science, math and engineering, together with a consideration of other factors such as rate of progress, quarter course load, trends in performance, etc.

Transfer students in engineering may apply for admission to the Division of Engineering at the time of transfer, but they must apply **no later than at the end of their third quarter of study at UCSD**. Regardless, transfer students should seek a preliminary appraisal by the department as soon as possible after they decide to attend UCSD. In most cases transfer students will not be admitted to engineering until one quarter of study at UCSD has been successfully completed.

Admission will be granted to the maximum number of students in each major program consistent with maintaining acceptable program quality. Since admissions are restricted, pre-engineering students may apply to more than one major degree program. Applications must be submitted to the Undergraduate Affairs Office in AMES (4103 Engineering Building) or in CSE (4016 Applied Physics and Mathematics Building) and ECE (2705 Engineering Building). These offices may be consulted for additional details.

ADMISSION OF NON-ENGINEERING MAJORS TO THE DIVISION OF ENGINEERING COURSES

The number of students admitted to some upper-division courses offered by the Division 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.

MESA ENGINEERING PROGRAM (MEP)

OFFICE: 1802 Applied Physics and Mathematics Bldg. (AP&M), Muir College.

The UCSD MESA Engineering Program provides academic support and guidance for undergraduate engineering students who qualify for MESA program services.

MESA (Mathematics, Engineering, Science Achievement) was founded in 1970 to increase the number of underrepresented ethnic students who graduate with a degree in computer science, engineering, or other mathematics-based majors.

UCSD MEP services include academic advising and workshops, scholarships, opportunities for summer employment, and a variety of social events throughout the academic year. Strong support from local industry provides students the opportunity to explore career possibilities as early as their freshman year.

As a part of the Division of Engineering, UCSD's MEP works closely with the engineering departments' administration and faculty to assist MEP students in accomplishing their educational goals.

APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

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STUDENT AFFAIRS: 4103B Engineering Building, Warren College

Professors

R. J. Asaro, Ph.D.
H. Bradner, Ph.D., *Professor Emeritus*
R. Cattolica, Ph.D.
S. Chien, M.D., Ph.D., *Director, Institute for Biomedical Engineering*

Y. C. Fung, Ph.D., *Professor Emeritus*
C. H. Gibson, Ph.D.
J. D. Goddard, Ph.D.
D. A. Gough, Ph.D.
G. A. Hegemier, Ph.D.
M. Intaglietta, Ph.D.
J. Lasheras, Ph.D.
P. A. Libby, Ph.D., *Professor Emeritus*
S.-C. Lin, Ph.D., *Professor Emeritus*
J. E. Luco, Ph.D., *Vice-Chair*
X. Markenscoff, Ph.D.
M. A. Meyers, Ph.D.
S. Middleman, D. Eng.
J. W. Miles, Ph.D., *Professor Emeritus*
D. R. Miller, Ph.D.
H. Murakami, Ph.D.
W. Nachbar, Ph.D., *Professor Emeritus*
S. Nemat-Nasser, Ph.D., *Director, Center of Excellence for Advanced Materials*
D. B. Olfe, Ph.D.
S. S. Penner, Ph.D., *Professor Emeritus*
M. J. N. Priestley, Ph.D.
E. Reissner, D. Eng., Ph.D., *Professor Emeritus*
G. W. Schmid-Schoenbein, Ph.D.
A. M. Schneider, Sc.D., *Professor Emeritus*
F. Seible, Ph.D.
K. Seshadri, Ph.D.
R. Skalak, Ph.D., *Professor in Residence, Director, Institute for Mechanics and Materials*
H. W. Sorenson, *Professor Emeritus*
F. E. Talke, Ph.D., *CMRR Endowed Chair, Department Chair*
C. W. Van Atta, Ph.D.
F. A. Williams, Ph.D., *Director, Center for Energy and Combustion Research*
B. W. Zweifach, Ph.D., *Professor Emeritus*

Associate Professors

D. J. Benson, Ph.D.
P. C. Chau, Ph.D.
A. H. Chokshi, Ph.D.
R. K. Herz, Ph.D.
J. B. Kosmatka, Ph.D.
C. Pozrikidis, Ph.D.
S. Rand, Ph.D., *Professor Emeritus*
J. B. Talbot, Ph.D.

Assistant Professors

A. Hoger, Ph.D.
A. D. McCulloch, Ph.D.
J. M. McKittrick, Ph.D.
R. L. Sah, M.D., Sc.D.
S. Sarkar, Ph.D.
K. S. Vecchio, Ph.D.

Affiliated Faculty

M. J. Bailey, Ph.D., *Associate Adjunct Professor of Computer Graphics*
A. L. Berlad, Ph.D., *Adjunct Professor of Combustion Science*

- J. F. Bille, Ph.D., *Professor of Ophthalmology*
 R. D. Blevins, Ph.D., *Adjunct Associate Professor of Flow Acoustics*
 D. B. Bogy, Ph.D., *Professor of Mechanical Engineering, UC Berkeley*
 J. W. Covell, M.D., *Professor of Medicine and Bioengineering*
 A. Fronek, M.D., Ph.D., *Professor Emeritus of Surgery and Bioengineering*
 A. S. Gordon, Ph.D., *Adjunct Professor of Engineering Chemistry*
 M. K.-W. Kwan, Ph.D., *Assistant Professor of Surgery and Bioengineering in Residence*
 R. L. Lieber, Ph.D., *Professor of Orthopaedics*
 R. M. Peters, M.D., *Professor of Surgery and Bioengineering*
 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*
 S. S. Sobin, M.D., Ph.D., *Adjunct Professor of Physiology*
 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

- S. Ahzi, Ph.D., *Assistant Research Engineer*
 J. Chris Armour, M.D., Ph.D., *Assistant Research Bioengineer*
 M. Beizaie, Ph.D., *Assistant Research Engineer*
 K. Fronek, M.D., Ph.D., *Research Physiologist*
 S. C. Li, Ph.D., *Assistant Research Engineer*
 D. Lim, Ph.D., Sc.D., *Research Bioengineer*
 K. Lund, Ph.D., *Assistant Research Engineer*
 L. Ni, Ph.D., *Assistant Research Engineer*
 J. Shyy, Ph.D., *Assistant Research Bioengineer*
 B. Skierczynski, Ph.D., *Assistant Research Bioengineer*
 L. A. Sung, Ph.D., *Associate Research Bioengineer and Lecturer*
 J. L. White, Ph.D., *Research Engineer*

DEPARTMENT FOCUS

The instructional and research programs are grouped into seven major areas: aerospace engineering, bioengineering, 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, Biology, Chemistry, Economics, Medicine, Electrical and Computer Engineering, Computer Science and Engineering and associ-

ated 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, Scripps Institution of Oceanography, and the School of Medicine.

The programs and curricula of AMES emphasize education in 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 a traditional engineering program leading to the **B.S. degree in engineering** with options in bioengineering, chemical engineering, mechanical engineering, structural engineering, aerospace engineering (a new option available to entering 1992 freshmen), and engineering science. AMES also offers a two-year upper-division program leading to a **B.A. or B.S. degree in applied science** in premedical bioengineering. The difference between receiving the B.A. or B.S. degree in applied science depends on the total number of units the student completes: the B.A. requires a minimum of 180 units, 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.

All AMES programs of study have strong components in laboratory, numerical computation on computers, and design applications and 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 also a traditional four-year curriculum in mechanics, vibrations, thermodynamics, structures, fluid flow, heat transfer, materials, control theory, and mechanical design. Graduates of this program may enter the high-technology electro-mechanical industry as well as find employment in the mechanical and aerospace industry.

Structural engineering concerns 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. This option was initiated in the 1992-93 academic year. The department does not anticipate offering all of the senior-year courses (see curriculum outline) until the 1994-95 academic year.

Bioengineering is an interdisciplinary major in which the principles and tools of traditional engineering fields, such as applied mechanics, materials, electrical, structural, and chemical engineering, are applied to characteristic 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 aspects of basic medical sciences. The curriculum prepares students for careers in the biomedical industry, but many bioengineering graduates continue their education in medical school. Students completing the four-year B.S. in engineering program have sufficient preparation in applied mechanics to permit employment in traditional engineering areas other than the biomedical industry, if they wish. The two-year B.A./B.S. pre-medical curriculum has significantly less engineering content 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, or neurosciences.

The **engineering science** program resembles the mechanical engineering program, except that 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, permitting specialization and in-depth study in one area of the engineering sciences or development of a sequence of courses emerging from the current research interests of the faculty of AMES and/or other departments, e.g., sequences in the earth sciences, transportation, or energy-related studies. Students intending to do postgraduate professional work in nontechnical fields such as business administration, law, or medicine may develop an appropriate sequence of courses. Although a sequence in the non-sciences may be permitted, the faculty adviser may insist on a substantial number of AMES or other science courses as technical electives. Students must consult their advisers to develop a sound course of study to fulfill the technical elective requirements of this program. This curriculum also allows the most humanities and social science courses (HSS) to meet college general-education requirements.

OTHER UNDERGRADUATE PROGRAMS OF STUDY IN AMES

The **engineering physics** program is jointly offered by the Departments of AMES, ECE, and Physics and is administered by the Department

of ECE. See "Engineering Physics Program" under ECE for details.

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 10, 11, 15, 102, 110, 111 or 121B. This set of courses provides a good introduction to engineering analysis and would be useful to non-engineering 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 following options within the four-year B.S. degree in engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET/EAC): bioengineering, chemical engineering, mechanical engineering, and structural engineering.

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 Studies 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 BISP 195 and AMES 198 are not allowed as technical electives in meeting the upper-division major requirements. AMES 195, 197, and 199 courses are allowed as technical electives 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 about deviations in scheduling AMES upper-division courses. 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.

FOUR-YEAR PROGRAMS IN ENGINEERING

MECHANICAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* ²	Chem. 6B/6BL	AMES 11
HSS ¹	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	AMES 130A
AMES 121A	AMES 121B	HSS
HSS	HSS	HSS
JUNIOR YEAR		
AMES 105A	AMES 102	AMES 170
AMES 163A	AMES 110	AMES 121C
AMES 130B	AMES 154	Math. 183 ³
HSS	HSS	HSS
SENIOR YEAR		
AMES 101A	AMES 101B	AMES 101C
TE ⁴	AMES 171A	AMES 171B
AMES 141 ⁵	TE ⁶	TE ⁴
AMES 158	AMES 156A	AMES 156B

* 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 A TE may be substituted by petition with prior approval.

⁴ 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.

⁵ ECE 171A may be substituted by petition, especially if ECE 171B is to be used as a controls elective.

⁶ TE restricted to AMES 157, a second energy or thermal science TE to meet ABET standards, or ECE 171B.

STRUCTURAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* ¹	AMES 15	AMES 11
HSS ²	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	HSS	HSS
HSS	AMES 102	AMES 110
AMES 121A	AMES 121B	AMES 130A
JUNIOR YEAR		
AMES 105A	AMES 163A	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 subjects 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 structure 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 structure may take AMES 137 instead of AMES 136. Civil structure 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. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*
Chem. 6A*	Chem. 6B/6BL	Chem. 6C/6CL
HSS ¹	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2BL	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 163A	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.

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FALL	WINTER	SPRING
FRESHMAN YEAR		
Math 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* ²	Chem. 6B/6BL	AMES 11
HSS ¹	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	HSS
AMES 121A	AMES 121B	AMES 130A
HSS	HSS	HSS
JUNIOR YEAR		
AMES 101A	AMES 163A	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

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).

BIOENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6* ¹	Chem. 6B/6BL	Biol. 1
HSS ²	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	AMES 130A
AMES 121A	AMES 121B	HSS
HSS	HSS	HSS
JUNIOR YEAR		
AMES 181	AMES 182A	AMES 182B
AMES 154	AMES 163A	AMES 170
AMES 103A	AMES 103B	AMES 183
HSS	BIPN 100	BIPN 102
SENIOR YEAR		
AMES 105A	HSS	HSS
AMES 184A	AMES 184B	AMES 184C
Chem. 126	AMES 158	AMES 174
TE	TE	AMES 186

* 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-B sequence may be taken in place of Chem. 6A-B.

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 subjects such as accounting, industrial management, finance,

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or personnel administration. Ten HSS courses are listed here; individual college requirements may be higher.

AEROSPACE ENGINEERING

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2BL
Chem. 6A* ²	Chem. 6B/6BL	AMES 11
HSS ¹	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	AMES 110
AMES 121A	AMES 121B	AMES 130A
HSS	HSS	HSS
JUNIOR YEAR		
AMES 163A	AMES 102	AMES 121C
AMES 130B	AMES 154	AMES 170
AMES 101A	AMES 101B	AMES 101C
AMES 105A	HSS	HSS
SENIOR YEAR		
HSS	AMES 159	HSS
AMES 104†	AMES 175A†	AMES 175B†
AMES 141	AMES 142†	TE
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.

† Not offered in 1993-94.

BIOENGINEERING: PREMEDICAL Lower-Division Program Preparation

AMES 10; Math. 2A*, 2B*, 2C*, 2DA, 2EA, 2F; Phys. 2A*, 2BL, 2B*, 2C, 2CL or 3A*, 2BL, 3B*, 3C, 2CL; Chem. 6A*, 6B, 6BL or 7A*, 7B, 6BL; BILD 1.

* 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.

Upper-Division Major Requirements¹

FALL	WINTER	SPRING
JUNIOR YEAR		
AMES 181	AMES 182A	AMES 182B
Chem. 140A ²	Chem. 140B	AMES 170
Chem. 143A	BICD 100	BIBC 100
HSS	HSS	HSS
SENIOR YEAR		
BIPN 140	BIPN 100	BIPN 102
AMES 103A	AMES 103B	AMES 174
TE ³	TE	TE
HSS	HSS	HSS

¹ Students in this program of study may obtain either the B.A. or B.S. in applied science bioengineering: premedical. The difference between receiving the B.A. or B.S. depends on the

total number of units the student completes: the B.A. requires 180 units, the B.S. requires 192 units. To obtain the B.S. degree, the additional unit requirement must be accomplished with technical electives. Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges.

² Chem. 6C is a prerequisite for Chem. 140A and must be taken in the freshman or sophomore year. Chem. 140C is a requirement for application to many medical schools.

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.

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 Division of Engineering. The admission requirements and procedures are described in detail in the section on "Admission to the Division 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-engineering majors who have achieved an average GPA of 3.0 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 3.0 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. It is expected that students have completed or have in

progress all eight prerequisite courses when applying.

TRANSFER STUDENTS

Transfer students may apply for admission to either the applied science or engineering program. 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 Division 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 pre-AMES or 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 student upon admission to the major. Pre-engineering majors can obtain programmatic advice from the Student Affairs Office.

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.

EARLY ADMISSION TO THE M.S. DEGREE—A COMBINED B.S./ M.S. PROGRAM

Upper-division students who have three quarters of residence at UCSD, with a grade-point average of 3.5 or better, may apply for "early admission" to the department's M.S. program.

Qualified students should apply at the beginning of the spring quarter of the junior year. Upon successful completion of the B.S. requirements with an overall grade-point average of at least 3.0, students who have been accepted are guaranteed admission to the AMES graduate program leading to the M.S. degree. This procedure is designed to allow students in consultation with their advisers to develop a five-year program of study, leading to both the B.S. and M.S. degrees, in which both undergraduate and graduate courses are taken during the fourth and fifth years. For students wishing to pursue the M.S. degree, this program has the advantage of allowing students to develop an in-depth specialization or to broaden their education while having considerable flexibility in course scheduling. At the end of any quarter in which the B.S. requirements are fulfilled, the student is automatically considered a graduate student, and all appropriate courses which have not been used to satisfy the requirements for the B.S. degree are applied toward the requirements for the M.S. degree (see section on "Master's Degree Program" in this catalog).

THE 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, bioengineering, engineering physics, mechanical engineering, and structural engineering.

Admission is in accordance with the general requirements of the graduate division, which typically requires a B.S. and/or M.S. degree in some branch of engineering, the physical sciences, or mathematics; a minimum GPA of 3.0; and strong letters of recommendation. In addition, the department requires *all* applicants to submit GRE General Test scores, and TOEFL scores are required from international applicants whose native language is not English. 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. pro-

gram. Policy in this regard is 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.

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. (Bioengineering and applied ocean sciences students have specific core course requirements; see below for details.) 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: forty units (ten courses) must be in course work, and eight 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. Eight 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

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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 the candidate's area of specialization. A student working toward the Ph.D. degree who has successfully passed one area of the department's Ph.D. examination need not take the comprehensive examination for the M.S. degree.

Bioengineering students are required to take the bioengineering core graduate courses—AMES 271A-B-C and AMES 272, 273, 278A—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, 181, 182A-B in the first year and AMES 272, 273, 278A in the second year. A student deficient in biology and chemistry may have to take Chemistry 126 or 131 and BIPN 100, 102 in the first year and AMES 271A-B-C in the second year.

Applied ocean sciences students are expected to demonstrate proficiency in mathematics and oceanography. Accordingly, when planning course programs they should enroll in AMES 294A-B-C (Methods in Applied Mechanics) and in some of the Scripps core courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

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 Solid Mechanics 231A	Elasticity 231B	Anelasticity 231C
Numerical Methods in Engineering Science 290	Computational Fluid Dynamics 223 or Finite-Element Methods Solid Mechanics 232	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 171A or ECE 176A or ECE 271A or ECE 273A	ECE 171B or ECE 176B or ECE 271B or ECE 273B	ECE 176C or ECE 271C or ECE 273C
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NOTE: Not all courses are offered every year.

¹ AMES graduate courses selected must be approved by the student's faculty adviser.

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
Numerical Methods in Engineering Science 290	Finite Element Methods in Solid Mechanics 232 or Computational Fluid Dynamics 223	Design and Mechanics in Computer Technology 291 or Computer-aided Analysis and Design 292
Materials Science ¹	TE ²	TE ²
ECE 171A or ECE 176A or ECE 271A or ECE 273A	ECE 171B or ECE 176B or ECE 271B or ECE 273B	ECE 176C 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 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
Advanced RC/PC Design 240 or Fracture Mechanics 233A	Bridge Design 242 or Micromechanics 233B	Earthquake Engineering 239 or Advanced Mechanics of Composite Materials 233C
Applied Mathematics 105A or 294A	Finite Element Methods in Solid Mechanics 232	Experimental Mechanics 234 or Independent Study 296

*Includes civil structures and aerospace and marine structures.
NOTE: Not all courses are offered every year.

¹ AMES graduate courses selected must be approved by the student's faculty adviser.

DOCTORAL DEGREE PROGRAM

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. (Bioengineering and applied ocean sciences students do have specific core course requirements; see below for details.) 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. Specific details in this regard can be obtained from AMES' Student Affairs Office.

Bioengineering students are required to take the bioengineering core graduate courses—AMES 271A-B-C and AMES 272, 273, 278A—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, 181, 182A-B in the first year and AMES 272, 273, 278A in the second year. A student deficient in biology and chemistry may have to take Chemistry 126 or 131 and BIPN 100, 102 in the first year and AMES 271A-B-C in the second year.

Applied ocean sciences students are expected to demonstrate proficiency in mathematics and oceanography. Accordingly, when planning course programs they should enroll in AMES 294A-B-C (Methods in Applied Mechanics) and in some of the Scripps Core Courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

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 examina-

tion 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 Senate 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. 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. Candidates for the doctorate remain 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 Division 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)

10. FORTRAN for Engineers (4)

FORTAN 77 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,S)

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. 2A-B, and Math. 2C (or concurrent enrollment). Priority enrollment given to pre-engineering and engineering majors. (F,S)

15. Introduction to Engineering Graphics and Design (4)

Introduction to the principles of engineering graphics and computer-aided design (CAD). Engineering graphics topics include orthographic, oblique, and axonometric projections; auxiliary and sectional views; and dimensioning. Weekly computer graphics laboratory sessions, with assignments carried out using AutoCAD software. Also, some C programming assignments that emphasize the underlying graphical elements in CAD software. Lectures by guest speakers on engineering design, including basic design concepts and case histories of de-

sign projects. *Prerequisites:* grade of C- or better in AMES 10. Restricted enrollment 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. 2DA, 2F. 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 exchanges. *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. 2DA, 2F. (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 geometrics. Application to the design of high-speed airplanes. *Prerequisites:* admission to the major and grade of C- or better in AMES 101A-B. (Not offered in 1993-94.)

105A-B-C. Introduction to Mathematical Physics (4-4-4)

Ordinary differential equations, Fourier series. Sturm-Liouville theory, elementary partial differential equations, complex variables, and integral transforms with applications to problems in particle and rigid-body dynamics, vibrations, wave motion, electric circuits, heat conduction, and fluid dynamics. (Students may not receive credit for both AMES 105A-B-C and ECE 105A-B-C.) *Prerequisites:* admission to the major and grades of C- or better in Phys. 2A-B and Math. 2DA. Enrollment in 105B-C requires grades of C- or better in 105A-B. (F,S)

110. Thermodynamics (4)

First and second laws and selected applications, e.g., thermochemistry, heat capacities and heats of reaction, engine cycles, etc. *Prerequisites:* grades of C- or better in Phys. 2A and Chem. 6B or 7B (or concurrent enrollment). 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 Chem. 12B, 131, 132, and AMES 103A-B-C. (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. 12B, 131, 132 and AMES 103A-B-C. (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 112, 113A, 140 and concurrent enrollment in AMES 115. (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, and 153. (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. Energy: Demands, Resources, Impact, Technology, and Policy (4)

Past and estimated future energy demands. Renewable and nonrenewable energy resources. Economic impact of energy use. Geophysical impact of energy use. Energy conservation in manufacturing, transportation, home use. Energy policy. *Prerequisites:* grades of C- or better in Math. 2A-B-C-D, Phys. 2A-B-C, and Chem. 6A-B. (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.* (W)

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.* (S)

121A. Mechanics I: Statics (4)

Principles of statics for particles and rigid bodies. Three-dimensional equilibrium analysis with unit vector representation. Analysis of simple, statically determinate structures under discrete and distributed loading; hydrostatics, internal forces in beams. Virtual displacements and the principle of virtual work. Potential energy and stability of equilibrium. Lectures include methods of problem formulation and problem solution with application to realistic engineering problems. *Prerequisites: Chem. 6BL, Math. 2C, Phys. 2A, 2B, 2BL with grades of C— or better. Phys. 2C/2CL may be taken concurrently. 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. 2DA 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. 2EA and AMES 121B.* (F,S)

130A. Solid Mechanics I (4)

Mechanics of deformable bodies under axial, torsional, shearing, and bending loads. Problems of design for pressure vessels, circular shafts, thin-walled members, and standard rolled-steel shapes. *Prerequisites: grades of C— or better in Phys. 2A-B-C, Math. 2DA-2EA, 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 121B, 130A, and 105A (or concurrent enrollment).* (F,W)

130C. Solid Mechanics III (4)

Linear and nonlinear one-dimensional theory of straight and curved beams. 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.* (S)

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-B and AMES 154.* (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; AMES 130C recommended.* (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, introduction 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.* (W)

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-C.* (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. 2C, 2F and AMES 132A-B.* (Not offered in 1993-94.)

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 AMES 163A and AMES 170.* (F)

141. Linear Control System Theory (4)

Stability of continuous-time single-input, single-output time invariant control systems emphasizing frequency-domain (s-plane) methods. Transient and steady-state behavior. Stability analysis by root locus, Bode and Nyquist plots. Compensators. Control system design. Brief introduction to state-variables and z-transforms. *Prerequisites: admission to the major and C— or better in AMES 163A.* (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.* (Not offered in 1993-94.)

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.*

ENGINEERING: APPLIED MECHANICS AND ENGINEERING SCIENCES

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 10, AMES 111, and Math. 2EA. (S)

154. Numerical Methods in Engineering (4)

This course discusses numerical methods for applications to engineering problems. Computer programming is an essential part of course training. 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. Applications of numerical methods to specific engineering problems are discussed. *Prerequisites:* admission to the major and grades of C- or better in AMES 10 and Math. 2EA. (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. (Not offered in 1993-94.)

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, FORTRAN, or Pascal. (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 or 181, 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)

163A. Linear Circuits (4)

Steady-state and dynamic behavior of linear, lumped-parameter systems, including electrical, mechanical, and thermal. 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. 2DA-2EA and Phys. 2A-B-C. (F,W)

163B. Linear Systems (4)

Continuous-time and discrete-time signals and systems. Fourier analysis of periodic and aperiodic signals. The Fourier transform. Convolution. Frequency response. Solution of constant-coefficient linear differential equations by Laplace transforms. Difference equations. *Prerequisites:* admission to the major and grades of C- or better in Math. 2EA and AMES 163A. (Not offered in 1993-94.)

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 163A, and junior standing in major, and completion of all lower-division physics and chemistry labs required for each AMES major. (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. (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 ma-

jors.) *Prerequisites:* grade of C- or better in AMES 170 and senior standing in the major. (W)

174. 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. (Priority enrollment given to bioengineering majors.) *Prerequisites:* grade of C- or better in AMES 170 and senior standing in major. (S)

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. (Not offered in 1993-94.)

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 applied 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, 113A, and 170. Enrollment in 176B requires grades of C- or better in 176A and 113B. (W,S)

181. Continuum Mechanics (4)

An introduction to continuum mechanics of both living and nonliving 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-B-C or Phys. 3A-B-C. (F)

182A. 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. Design of surgical procedures and prosthetic devices. *Prerequisites:* admission to the major and grade of C- or better in AMES 181. (W)

182B. Biomechanics (4)

Bioviscoelastic fluids and solids. Non-Newtonian behavior of blood, synovial fluid, mucus, and protoplasm. Basic mechanical properties of collagen and elastin, bone, cartilage, muscles, blood vessels, and other living tissues. Application of continuum mechanics at great depth. Artificial implantable materials and design of prosthetic devices. *Prerequisites:* admission to the major and grade of C- or better in AMES 182A. (S)

183. Biomedical Electronics and Electrical Engineering (4)

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. Measurements and signal analysis in biological systems and medicine. *Prerequisites:* admission to the major and grade of C- or better in AMES 163A. (S)

184A. Principles of Bioengineering Design I (4)

General principles of electronics related to biomedical instrumentation. Basic circuits. Specialized amplifiers. Electrocardiography. Ultrasonic instruments. Electrical safety hazards. (Priority enrollment given to bioengineering and systems science majors.) *Prerequisites: admission to the major and grade of C- or better in AMES 163A.* (F)

184B. Principles of Bioengineering Design II (4)

Statistics applied to bioengineering design. Analytical approach to biological systems with emphasis on modeling, computer simulation. Biomedical problems will include fluid flow resistance, storage and compliance, use of transfer functions, impedance, various types of biological signals. *Prerequisites: admission to the major and grades of C- or better in AMES 184A and AMES 105A (or concurrent enrollment).* (W)

184C. Principles of Bioengineering Design III (4)

Biomaterials and artificial internal organs: an overview of the fundamentals of materials science as applied to medical engineering. Natural and synthetic polymers. Ceramics and metals. Phenomena occurring at the interface between implanted materials and the body. Illustration of these basic principles by examples from current research. *Prerequisites: admission to the major and grades of C- or better in AMES 184A-B.* (S)

186. 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. (Priority enrollment given to bioengineering majors.) *Prerequisites: admission to the major and grades of C- or better in AMES 103A-B, 121A-B, 130A, 154, 181, and AMES 105A.* (S)

195. Teaching (1-4)

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 availability of positions, students will work in a local industry or hospital (on a salaried or unsalaried basis) under the supervision of a faculty member and industrial supervisor. Coordination of the Engineering Internship is conducted through UCSD's Academic Internship Program. Time and effort to be arranged. 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, bioengineering, 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. Kolmogoroff 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.*

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)

This class discusses computational methods in fluid mechanics. Topics include methods for computing fluid interfaces, boundary integral and singularity methods for potential flow, vortex methods, boundary integral methods for Stokes flow, methods for solving the boundary layer equations, and finite-difference methods for viscous flow. *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 discretization 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.*

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, compliance 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. *Prerequisites: 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)

Stability analysis of structural elements under steady, oscillatory, and impulsive loadings. Elastic and anelastic stability problems. *Prerequisite: AMES 130A-B-C 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.*

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.*

244. Offshore Structures (4)

Categories of offshore structures. Analysis under gravity, wave, and seismic loading. Soil/structure interaction. Structural details. Materials for offshore structures. Design problems. *Prerequisites: AMES 230, AMES 134 or equivalent course, AMES 136 or equivalent course or consent of instructor. Recommended: basic course in structural dynamics.*

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 fabrication: 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.*

271A. Cell and Molecular Biology (4)

A general survey will include samples of structure-function relationships at the cell and tissue level. Emphasis will be placed 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 equivalent or consent of instructor.*

271B. Cardiovascular Physiology (4)

Physical concepts of behavior of heart, large blood vessels, vascular beds in major organs and the microcirculation. Included will be the physical and physiological principles of blood flow, blood pressure, cardiac work, electrophysiology of the heart, descriptions of special vascular beds, including their biological and hemodynamic importance. Integration of separate components through nervous and humoral controls will be analyzed. *Prerequisites: Biology 151 and 153 or equivalent or consent of instructor.*

271C. Respiratory and Renal Physiology (4)

Mechanics of breathing. Gas diffusion. Pulmonary blood flow. Stress distribution. Gas transport by blood. Kinetics of O₂ and CO₂ exchange. VA/Q relations. Control of ventilation. Glomerular and proximal tubule functions. Water metabolism. Control of Na and K in kidney. *Prerequisites: BIPN 100 and 102 or equivalent or consent of instructor.*

272. 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. The courses 272, 273, 278 form a core sequence in bioengineering. *Prerequisites: AMES 103B, 181, 182B or equivalent, or consent of instructor.*

273. Biomedical Transport Phenomena (4)

Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. *Prerequisite: AMES 272 or consent of instructor.*

274. Advanced Biomedical Transport Phenomena (4)

Applications of heat, mass, and momentum transfer in biomedical systems. Extension of the principles encountered in AMES 272 and 273 to practical biomedical systems. *Prerequisites: AMES 272, 273, or consent of instructor.*

275. 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: AMES 271A and 272 or consent of instructor.*

276. 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.*

277. Microcirculation in Health and Disease (4)

Structural and functional aspects of transport and blood-tissue exchange in key organs during states such as circulatory shock, bacterial toxemia, hypertension. Also physical and ultrastructural techniques used to analyze small-vessel dynamics. *Prerequisite: consent of instructor.*

278A. 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: AMES 272 or equivalent or consent of instructor.*

278B. 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: AMES 272 or equivalent or consent of instructor.*

279. Selected Topics in Biophysics (4)

Selected topics in biophysics with emphasis 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. *Prerequisites: AMES 272, 273, or consent of instructor.*

281. Seminar in Bioengineering (1)

The course involves weekly seminars given by faculty, visitors, postdoctoral research fellows, and graduate students concerning research topics in bioengineering and related subjects. Students report their own research. May be repeated for credit. This course does not apply toward the M.S. graduation requirements. (S/U grades only.)

290A. Numerical Methods in Engineering Science (4)

Numerical methods with computer exercises from various branches of engineering science. Interpolation. Integration. Solution of system of linear and nonlinear equations. Fast Fourier transform. Solution of ordinary differential equations. *Prerequisite: AMES 154 or consent of instructor.*

290B. Numerical Methods in Engineering Science (4)

This course will discuss the numerical solution of differential equations that arise in various branches of applied mechanics and engineering. Topics include finite difference methods, spectral methods, finite element methods, boundary integral methods, particle methods, as well as specialized methods for problems with special considerations. *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 print-

ing; 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 statistics, 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.*

Michael L. Fredman, Ph.D.

William E. Howden, Ph.D.

T. C. Hu, Ph.D.

Christos Papadimitriou, Ph.D., *Jacobs Professor of Computer and Information Science*

Michael Saks, Ph.D.

Walter J. Savitch, Ph.D.

S. Gill Williamson, Ph.D., *Chair*

Associate Professors

Francine D. Berman, Ph.D.

Chung-Kuan Cheng, Ph.D.

Patrick Dymond, Ph.D.

Keith Marzullo, Ph.D.

Victor Vianu, Ph.D.

Assistant Professors

Scott B. Baden, Ph.D.

Richard K. Belew, Ph.D.

Garrison Cottrell, Ph.D.

Charles P. Elkan, Ph.D.

William G. Griswold, Ph.D.

Russell Impagliazzo, Ph.D.

Paul Kube, Ph.D.

Alex Orailoglu, Ph.D.

Joseph Pasquale, Ph.D.

Ramamohan Paturi, Ph.D.

George Polyzos, Ph.D.

Venkat Rangan, Ph.D.

S. Heather Woll, Ph.D.

Adjunct Faculty

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.

THE MAJOR PROGRAMS FOR UNDERGRADUATES

The department offers four-year programs in computer science and computer engineering. These programs, which lead to the B.S. degree, prepare students for employment in computer industries and for graduate work in these fields. In addition, the department offers a program leading to the B.A. degree in computer science. This is intended for students desiring more time for undergraduate studies outside their major subject. It prepares students for graduate study in their respective fields as well as for immediate employment.

To graduate in four years with a B.S. in computer science or computer engineering, a student without advanced standing should enroll for approximately eighteen units for three quarters and sixteen units during other quarters (or attend some summer quarters). In addition, each stu-

COMPUTER SCIENCE AND ENGINEERING (CSE)

OFFICES:

Undergraduate Affairs 4016

Graduate Affairs 4018

Applied Physics and Mathematics Building, Muir College

Professors

Kenneth L. Bowles, Ph.D., *Professor Emeritus*

Walter A. Burkhard, Ph.D.

Flaviu Cristian, Ph.D.

dent 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.

To graduate, a grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. Approved technical electives for each major are listed in this section under each respective major. If a student wants to deviate from the list, the course must be petitioned through the department. The limit on the number of technical electives that can be substituted is as follows:

B.S. Computer Science—maximum of three courses outside of list.

B.S. Computer Engineering—maximum of two courses from outside of CSE or ECE departments.

B.A. Computer Science—maximum of two courses outside of list.

A total of at most four units of either CSE 197, 198, or 199 may be applied in fulfilling the requirements for a major program in the Department of Computer Science and Engineering. These must be taken on a Pass/No Pass basis.

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. If the student's eventual aim is to take a Ph.D., he or she will be able to begin research earlier and spend a shorter time in completing the degree. The student's choice of electives must be discussed with his or her adviser.

ADMISSIONS

Admission to CSE majors is based on performance in required lower-division courses. See section on "Admission to majors in the Division of Engineering" in this catalog.

After six quarters of study at UCSD (or three quarters for transfers), a student's admission to the CSE department will be decided. Pre-CSE students denied admission to a CSE major will automatically have their major converted from

"Pre-CSE" to "Undeclared" by the department at the time of their denial.

In addition, pre-CSE students will not be allowed to continue to enroll in upper-division CSE courses beyond the fall quarter of their junior year. Only students who are admitted to a CSE major will be allowed to continue to enroll in upper-division CSE courses.

However, CSE minors and students in related majors who are required to take CSE courses will be allowed to enroll in upper-division CSE courses as long as they have completed the required prerequisites or equivalents.

THE B.S. CURRICULA

COMPUTER SCIENCE

The computer science program offers a strong emphasis on engineering mathematics, basic engineering science, and software. 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 required lower-division courses are:

1. Math. 2A/2AH, 2B/2BH, 2C/2CH, 2DA/2DH, 2EA/2EH, and 2F/2FH.
2. Phys. 2A-B-C-D. Math. 2A is 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 majors' sequence (Phys. 4A-B-C-D) for Phys. 2A-2B-2C-2D.
3. Phys. 2BL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 4 sequences.
4. CSE 65 (or 62B), 64, and 70 (or ECE 80).
5. ECE 50A-B and ECE 52AL-BL.
6. Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The required upper-division courses are Math. 183 and:

Junior Year

- (a) CSE 160A-B
- (b) CSE 161A-B
- (c) CSE 163A-B
- (d) CSE 170A-B
- (e) CSE 165, 173
- (f) Technical elective (eight units)

Senior Year

- (a) CSE 171A-B
- (b) CSE 175B-C
- (c) CSE 179
- (d) Technical elective (sixteen units)

Electives

- ECE 105A/B/C
- ECE 121A/B/C
- ECE 136A/B
- ECE 140A/B/C
- ECE 141A/B/C
- ECE 152A/B
- ECE 154A/B/C
- ECE 159A/B/C
- ECE 160A/B
- ECE 161A/C
- CSE 162
- CSE 164B
- CSE 166
- CSE 170C
- CSE 171C
- CSE 172A/B
- CSE 174
- CSE 176
- CSE 177
- CSE 178A/B
- CSE 180
- CSE 181
- CSE 186
- CSE 197
- CSE 198
- CSE 199
- AMES 141A/B/C
- Math. 102
- Math. 160A/B
- Math. 170A/B/C
- Math. 171A/B
- Math. 172
- Math. 173
- Math. 180A/B/C
- Math. 181A/B

COMPUTER ENGINEERING

Students wishing to take the computer engineering curriculum must be admitted to either the CSE or ECE department. The set of required courses and allowed electives is the same in both departments.

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.

The required lower-division courses are:

1. Math. 2A/2AH, 2B/2BH, 2C/2CH, 2DA/2DH, 2EA/2EH, and 2F/2FH.
2. Phys. 2A-2B-2C-2D. Math. 2A is 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 majors' sequence (Phys. 4A-B-C-D) for Phys. 2A-B-C-D.
3. Phys. 2BL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 4 sequences.
4. CSE 65 (or 62B), 64, and 70 (or ECE 80).
5. ECE 50A-B and ECE 52AL-BL.
6. Chem. 6A-6B or Chem. 7A-7B. A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The required upper-division courses are:

Junior Year

- (a) ECE 105A
- (b) ECE 152A
- (c) CSE 160A-B
- (d) CSE 170A-B-C
- (e) CSE 175B-C
- (f) ECE 171A
- (g) Technical elective (four units)

Senior Year

- (a) ECE 160A-B
- (b) ECE 167
- (c) CSE 161A-B
- (d) CSE 163A
- (e) CSE 171A-B
- (f) CSE 172B
- (g) CSE 180
- (h) Technical elective (eight units)

Electives

Any upper-division CSE or ECE course not already listed as a core course is acceptable as a technical elective with the exception of ECE 138.

THE B.A. CURRICULUM

COMPUTER SCIENCE

The required lower-division courses are:

1. Math. 2A/2AH, 2B/2BH, 2C/2CH, 2DA/2DH, and 2EA/2EH.
2. Phys. 2A-B-C. Math. 2A is 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 majors' sequence (Phys. 4A-B-C) for Phys. 2A-B-C.

3. CSE 65 (or 62B), CSE 70 (or ECE 80).

The required upper-division courses are:

Junior Year

- (a) CSE 160A-B
- (b) CSE 161A-B
- (c) CSE 163A-B
- (d) CSE 170A
- (e) CSE 175B

Senior Year

- (a) CSE 165
- (b) CSE 171A
- (c) CSE 179
- (d) Technical elective (sixteen units)

Electives

- CSE 162
- CSE 164B
- CSE 166
- CSE 170B/C
- CSE 171B/C
- CSE 172A/B
- CSE 173
- CSE 174
- CSE 175C
- CSE 176
- CSE 177
- CSE 178A/B
- CSE 180
- CSE 181
- CSE 186
- CSE 197, 198 or 199
- ECE 159A/B/C
- ECE 160A/B
- ECE 161A/C
- Econ. 172A/B/C
- Math. 160A/B/C
- Math. 170A/B/C
- Math. 172
- Math. 173

MINOR CURRICULA

CSE offers four minors (listed below). Admission is based on a student's performance in CSE 62B or 65, 70, and four courses in the Math. 2 sequence. The prerequisites for these minor curricula require certain other courses which must therefore be anticipated in the student's program. Revelle students should consult their provost's office concerning their noncontiguous minor.

Not all minor curricula are available to a student pursuing a CSE major curriculum. See the departmental office for a list of permissible minors.

Programs of concentration for Warren College should be selected from this list. Rules concerning overlap with the major curriculum are available from the Office of the Provost, Warren College.

Artificial Intelligence

CSE 65 or 62B, 70, 161A, 162, 178A-B

Computer Hardware

CSE 65 or 62B, 70, 170A-B, 175B-C

Computer Software

CSE 65 or 62B, 70, 161A, 163A-B, 173 (or 171A)

Computer Theory (seven courses required)

CSE 65 or 62B, 70, 160A, 161A-B, 165, and 179

COMPUTING FOR STUDENTS IN THE HUMANITIES AND SOCIAL SCIENCES

An introduction to the use of computers is provided in CSE 62A and 62B (Introduction to Programming I and II) and CSE 60 (The Language of the Computer).

ADMISSION TO 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 CSE 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 CSE 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 CSE courses will require obtaining either course authorization through telephone registration or de-

partment stamps on a registration form, and it will be given only by the student affairs staff.

All students enrolled at UCSD and wishing to enter a departmental major or minor curriculum must submit an application in accordance with the policy set forth by the Division of Engineering (above) by the end of the second week of the spring quarter of the preceding year. Applications may be obtained from the Undergraduate Affairs Office in Room 4016 Applied Physics and Mathematics Building. Incoming transfer students must submit their application within three quarters of study at UCSD. Transfer students who wish to enter directly one of the CSE major curricula must show evidence that they have completed equivalent prerequisite courses.

The department will set an overall quota for admission to the major and minor curricula for each academic year. It will be based upon:

1. Preregistration of students who have already completed upper-division CSE courses;
2. Preregistration of students required to enroll in upper-division courses for major curricula offered by other departments;
3. Estimates of the number of incoming transfer students who will be admitted to the major curricula; and
4. Class limits for upper-division courses.

TRANSFER STUDENTS

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 CSE 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.

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.

FIVE-YEAR BACHELOR'S-MASTER'S PROGRAM

Students interested in the combined bachelor's-master's degree may start taking graduate classes in the senior year, with permission from the student's adviser. Graduate classes the student takes in the senior year cannot be counted towards the bachelor's degree as well as the M.S. degree. Students must apply for graduate study by regular application and meet the regular criteria for admission. Graduate Record Examination scores are required.

COMPUTER SCIENCE PROGRAM

MASTER OF SCIENCE PROGRAM

The department offers the master of science degree in computer science. The degree is offered under both the Thesis Plan I and the Comprehensive Examination Plan II and 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.

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 six core courses must be completed with an average grade of B, and no grade below B-:

- CSE 200 or CSE 201
- CSE 202
- CSE 221
- CSE 230 or CSE 231
- CSE 240
- CSE 292

Electives

Four or more technical electives consisting of other CSE graduate courses or approved alternatives for a total of sixteen units. The 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 sixteen units required.

Thesis

Twelve units of CSE 298 must be taken to fulfill the research requirement.

A thesis based on the research must be written and subsequently reviewed by the committee, which is set up at the beginning of the first quarter of CSE 298, 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 science under this plan, a student must complete the course requirements listed below and pass a written comprehensive examination. The comprehensive examination is 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 the first-year graduate computer science programs. In particular, 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.

Core Courses

The following six core courses must be completed with an average grade of B, and no grade below B-:

- CSE 200 or CSE 201
- CSE 202
- CSE 221
- CSE 230 or CSE 231
- CSE 240
- CSE 292

Electives

Six or more technical electives consisting of other CSE graduate courses or approved alternatives for a total of twenty-four units are required. The units obtained in courses CSE 293, 298, 299, 501, and any of the seminar courses CSE 209, 229, 269, and 290 do not count towards the twenty-four units required.

Project

Four units of CSE 293.

Comprehensive 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.

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." In harmony 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. In particular, 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. 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. Each student is allowed three attempts to pass the examination. A student typically completes the written part of the comprehensive examination successfully by the fall quarter of the second year.

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. Students are expected to take this examination within one year following the quarter in which they pass the written comprehensive examination.

More information regarding the comprehensive examination can be found in a separate document provided by the CSE graduate office.

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 (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 master of science degree requires forty-nine units of work; students may elect the thesis option Plan I or comprehensive examination op-

tion Plan II. For full-time students, all the requirements must be completed within two years. Prepared students can complete the program in one year 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 or CSE 203
- 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 to fulfill the research requirement.

A thesis based on research must be written and subsequently reviewed by the committee, which is set up at the beginning of the first quarter of CSE 298, 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 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. In particular, 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. More information about the comprehensive examination can be obtained in a separate document from the CSE graduate office.

Core Courses

Three Software Courses:

CSE 202 or CSE 203
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.

Thesis

Four units of CSE 293.

Comprehensive Examination

Must secure at least a master's-level pass in the written comprehensive examination.

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." In harmony 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

Students are expected to complete the following computer engineering curriculum of forty-nine unit course requirement within the first two years. 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.

A student must obtain a research adviser from the CSE or ECE faculty, and as soon as fulfillment of the course requirements is well under way, the student should begin a research project.

Core Courses

Each Ph.D. student must complete the following core requirements:

Three Software Courses:

CSE 202 or CSE 203
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 293

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. In particular, 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. 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. Each student is allowed three attempts to pass the examination. A student typically completes the written part of the comprehensive examination successfully by the fall quarter of the second year.

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. Students are expected to take this examination within one year following the quarter in which they pass the written comprehensive examination.

More information regarding the comprehensive examination can be found in a separate document provided by the CSE graduate office.

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*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

LOWER DIVISION

60. The Language of the Computer (4)

(Same as Ling. 63.) This course will focus on differences between human and computer languages. Topics also include an overview of UNIX and the roles played by hardware and software. Students will learn to use editors, word-processing programs, utilities, and to write CSH scripts. This course has no prerequisite.

62A. Introduction to Programming I (4)

Teaches basic skills for using UNIX utilities to maintain files. Topics include the notion of files and directories, use of editors, electronic mail, and changing the user's environment by means of aliases and simple shell scripts. Introduction to algorithms and a top-down program design. Introduction to the PASCAL language. A student may not receive credit for CSE 62A after receiving credit for CSE 65.

62B. Introduction to Programming II (4)

Hierarchical program structures, top-down and bottom-up testing techniques, use of assertions, introduction to data structures, simple analysis of round off error in real arithmetic. Completion of the PASCAL programming language, including records, files, and pointers. (A student may not receive credit for both CSE 65 and CSE 62B.) *Prerequisites: Math. 1A and CSE 62A.*

64. 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 hours' lecture, two hours' recitation. The recitation sections will be divided into two sets, those which use FORTRAN as the course programming language and those which use PASCAL. *Prerequisite: Math. 2B and CSE 62B or 65 or equivalent course emphasizing structured programming approved by the instructor.*

65. Introduction to Programming Techniques (4)

Basic design methods for effective programming, including the notion of an algorithm, hierarchical program structures, top-down and bottom-up testing techniques, use of assertions, introduction to data structures, simple analysis of round-off error in real arithmetics. The PASCAL programming language, including records, files, and pointers. (A student may not receive credit for both CSE 65 and CSE 62B.) *Prerequisite: Math. 2A (may be taken concurrently).*

69. Computers and Society (4)

An introduction to computers, their applications, and their impact on people and social institutions. Factual and technical information for making objective judgments about computer use. Social problems created by the use of computers and tools for solving them. Constructive and creative thought about technology and its social impact. Three hours' lecture. This course has no prerequisite; it is based on the hypothesis that the computer affects all of us and is important for everyone to understand.

70. Introduction to Systems Programming (4)

Introduction to the fundamental physical and mathematical structures of computer software engineering. Topics include machine structure and assembly language programming, program control structure, program data structure, and analysis of program correctness and performance. Three hours' lecture. *Prerequisite: CSE 62B or 65, or consent of instructor.*

75. Principles of Programming (4)

Design methods for programming and problem solving, including recursion and abstract data types. The C programming language, including structures, pointers, type definitions, and the preprocessor. The UNIX programming environment and tools, including streams, C standard libraries, project maintenance facility, and symbolic debugger. Three hours' lecture, one hour recitation, and six hours' laboratory per week. A student may not receive credit for CSE 75 after receiving credit for CSE 161A. *Prerequisites: CSE 62B/65; Math. 2C.*

77. Introduction to Object-Oriented Programming (4)

Object-oriented problem solving, encapsulation, inheritance, and polymorphism. The C++ programming language, including declarative and imperative statements, functions, classes, method access control, references, virtual functions, operator overloading, input-output streams, constructors and destructors, and conversions. Standard C++ libraries, UNIX programming environment. *Prerequisite: CSE 75 or consent of instructor.*

UPPER DIVISION

160A. Discrete Mathematics (4)

Introduction to discrete structures and mathematical reasoning which will be useful in designing and analyzing algorithms. Topics include mathematical logic and methods of proof, natural numbers and mathematical induction, program verification; sets and operations on sets, basics of probability, inductive definition of sets, finite and infinite sets; relations and functions, equivalence relations and partitions, order relations; and basic abstract algebra. Three hours' lecture.

160B. Combinatorics and Graph Theory (4)

Introduction to combinatorial reasoning and graph theory. Topics include basic counting principles, permutations and combinations, binomial coefficients, more on probability; recurrence relations; generating functions; inclusion-exclusion principle; analysis of algorithms; introduction to graph theory with a selection of topics from trees, paths, connectivity, planarity, coloring, and matching. Three hours' lecture. *Prerequisite: CSE 160A.*

161A. Data Structures I (4)

Principles of data types and structures, abstract data types. Lists, arrays, tables, priority queues, and static dictionaries. Run-time analysis. Linked lists, hashing, and tree structures. *Prerequisites: CSE 62B or 65, 70.*

161B. Data Structures II (4)

Static and dynamic structures, files, secondary storage models, searching. *Prerequisites: CSE 160A and 161A or equivalent.*

162. Programming Languages for Artificial Intelligence (4)

Experience using LISP, PROLOG, and an object-based language to solve typical problems from artificial intelligence (AI). Rela-

tive advantages and disadvantages of these languages and considerations for selecting a language for a particular problem will be discussed. *Prerequisite: CSE 161A.*

163A-B. Compiler Construction (4-4)

Principles and practice of constructing translators for programming languages, compiling, lexical analysis, syntactic analysis, context-free grammars, symbol tables, syntax-directed translation, optimization, automatic generation of lexical and syntactic analyzers. *Prerequisites: CSE 70 and CSE 161A.*

164A. Introduction to Scientific Computation (4)

Students will learn the basic techniques for solving numerical problems: error analysis, numerical differentiation and integration, interpolation, root finding, systems of linear equations. (Students who have taken CSE 64 may not take CSE 164A for credit.) *Prerequisites: Math. 2DA and CSE 65.*

164B. Introduction to Advanced Scientific Computation (4)

Selected topics in scientific computation, including parallel and vector computation; visualization; solution of elementary ordinary and partial differential equations; elementary sparse matrix linear algebra; software tools and application libraries such as LINPACK and MATLAB. Course content will vary according to the instructor. *Prerequisites: CSE 164A (or CSE 64), CSE 174, CSE 177, and Math. 2E.*

165. Algorithms, Automata, and Formal Languages (4)

Automata theory: finite state machines, pushdown automata, Turing machines, computability, Formal language theory. Three hours' lecture. *Prerequisites: CSE 163A and CSE 160A.* (A student may not receive credit for both CSE 165 and Math. 166.)

166. Computer Networks (4)

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. *Prerequisites: CSE 160A-B and 170A.*

170A. Introduction to Digital Logic (4)

Data representation and coding. Combinational and sequential logic design: Boolean algebra, switching functions, gates, bilateral switches, adders, state machines, flip-flops, timing, Mealy and Moore machines, analysis and synthesis of canonical forms, intermediate logic building blocks, nontraditional approaches to logic design. *Prerequisite: CSE 70 or consent of instructor.*

170B. Introduction to Computer Architecture (4)

Register-transfer language approach to sequential machine design. CPU organization. Instruction sets. Microprogrammed vs. hardwired control units. Busses. Memory elements and organization; the memory hierarchy. Input/output, interrupts. Computer arithmetic. Microprocessors. Three hours' lecture. *Prerequisite: CSE 170A or consent of instructor.*

170C. Digital System Concepts and Design (4)

Structured machine design, algorithmic state machines, micro-coding, mixed-mode logic, error detection and correction, testability, gate arrays, standard cells, PLAs, memory design, packaging issues, asynchronous circuits, timing issues. A complex digital system (such as that architected in CSE 170B) will be designed and built. *Prerequisites: CSE 170A-B and 175B. CSE 175C recommended (may be taken concurrently).*

171A. Principles of Operating Systems I (4)

(Formerly CSE 171A-B.) 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, interrupts, buses, channels, processes, descriptors, process synchronization, interprocess communication, processor scheduling, memory management, virtual memory, caching, buffers, naming, files,

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and interactive command interpreters. *Prerequisites: CSE 161A and CSE 170B.*

171B. Principles of Operating Systems II (4)

The course builds on the fundamental operating systems principles learned in 171A, and illustrates their use in a real system: the Unix operating system. A number of basic aspects of the Berkeley Unix implementation are covered, such as processes, virtual memory, I/O devices, interprocess communication, and networking. The actual policies used for process scheduling, page replacement, file system caching, and network control are discussed. Depending on the instructor, the course may stress basic operating system aspects or basic networking aspects. *Prerequisite: CSE 171A.*

171C. Advanced Computer 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. *Prerequisites: CSE 171A and B.*

172A-B. VLSI Systems Design (4-4)

System architecture, logic design, symbolic layout, timing, VLSI testing, CAD technologies, silicon compilation, and intelligent VLSI design tools. Produce, design, simulation, layout, and testing of sample microprocessor using advanced VLSI design workstations. *Prerequisites: CSE 170A-B.*

173. Comparative Study of Programming Languages (4)

Introduction to several high-level programming languages. Comparison of language features and analysis of language design. Courses will involve programming with each language studied (e.g., APL, LISP, and SNOBOL). Three hours' lecture. *Prerequisites: 62B or 65, and CSE 70 or consent of instructor.*

174. Introduction to Parallel Computation (4)

General introduction to parallel computing, focusing on parallel algorithms and architectures. Parallel models: Flynn's taxonomy, dataflow models. Parallel architectures: systolic arrays, hypercube architecture, shared memory machines, dataflow machines, reconfigurable architectures. Parallel algorithms appropriate to each machine type are also discussed. *Prerequisite: upper-division status or consent of instructor.*

175B. Digital Hardware Laboratory (4)

Introduction to common digital integrated circuits: gates, memory circuits, MSI components. Operating characteristics, specifications, and applications. Design of simple combinational and sequential digital systems such as arithmetic processors, game-playing machines. Construction and debugging techniques. One hour's lecture, six hours' laboratory. (Students who have taken ECE 138 may not take CSE 175B for credit.) *Prerequisite: CSE 70. CSE 170A recommended (may be taken concurrently) or consent of instructor.*

175C. Microprocessor Systems Design (4)

Writing and debugging programs on a microprocessor development system. Timing and loading considerations in a system hardware design. A critical comparison of addressing models. I/O structures, interrupt capabilities, and direct memory access techniques. Two hours' lecture, four hours' laboratory. *Prerequisites: CSE 170B (may be taken concurrently), CSE 70 or equivalent, and CSE 175B or equivalent.*

176. Database System Principles (4)

Introduction to database system architecture. Principles of access methods and files; data models, including hierarchical, network, and relational; data definition, manipulation, and query languages; data dependencies, transactions, concurrency, and recovery. Three hours' lecture. *Prerequisite: CSE 161B.*

177. Computer Graphics (4)

Representation of pictorial data. Two-dimensional and three-dimensional transformations and perspective curves, sur-

faces, and shading. Graphic I/O devices: raster, vector, and storage displays. Graphics software and applications. Three hours' lecture, six hours' laboratory. *Prerequisites: CSE 161A-B and CSE 170A.*

178A. Artificial Intelligence I (4)

The first quarter of a two-quarter undergraduate sequence surveying artificial intelligence. Knowledge representation techniques based on logic, semantic networks, and production systems will be the focus of this course. Theorem proving will also be considered. Assignments will require programming in LISP and PROLOG. *Prerequisites: CSE 162, CSE 160A, and CSE 161A.*

178B. Artificial Intelligence II (4)

Heuristic search of problem state spaces, planning and problem-solving techniques will be considered. Applications in natural language and vision, the expert systems methodology, and topics from machine learning and cognitive science will also be mentioned. *Prerequisite: CSE 178A.*

179. Analysis of Algorithms (4)

Methods for designing measures of computational cost, for computing the cost of algorithms and for computing the intrinsic costs of common computational tasks. Tasks considered include sorting, tree searching, matrix manipulations, and polynomial evaluation. *Prerequisites: CSE 160A-B and 161A-B.*

180. Software Engineering (4)

Different aspects of software engineering will be studied. Topics include design methods, requirements and specification, validation and program testing, maintenance, and programming methodology. Three hours' lecture. *Prerequisites: CSE 161A-B and CSE 163A.*

181. Information Retrieval (4)

Introduction to the automatic location of relevant "documents," i.e., samples of free-text like books, articles, electronic mail, etc. *Prerequisites: CSE 161B.*

186. Distributed Databases Practicum (4)

Alternative distributed database system architectures: client-server, fully decentralized. Distributed conflict detection and resolution, agreement and commit protocols, Data fragmentation and replication, distributed query optimization, fault tolerance, load balancing. Operating system issues, transaction monitors. Participation in a department research project. *Prerequisite: 171A or consent of instructor.*

195. Teaching (2 or 4)

Teaching and tutorial activities associated with courses and seminars. Not more than four units of CSE 195 may be used for satisfying graduation requirements. (P/NP grades only.) Three hours' lecture. *Prerequisite: consent of the department chair.*

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.) *Prerequisites: consent of instructor and approval of the department.*

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 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.*

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 165 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 165 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 179 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 165 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 direc-

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tion. 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 161A-B, 163A, 171A, or consent of instructor.*

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 171A-B 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 trade-offs, and design methodologies. Topics will include layering, data link control, routing, flow control, topological design, performance evaluation techniques (measurements, analysis, and simulation). *Prerequisite: CSE 166 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.) *Prerequisites: 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, analysis 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, re-

liability, 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 166; 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 173 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 161A-B, 163A-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. *Prerequisites: CSE 161A-B 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.) *Pre-*

requisites: one of CSE 176 or CSE 232, and CSE 200 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 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 170B 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 178B 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

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unification grammar. (S/U grades permitted.) *Prerequisite:* graduate standing and either 178B 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. *Prerequisites:* 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.

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.) *Prerequisites:* 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.

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. *Prerequisites:* 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.

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)

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Victor C. Anderson, Ph.D., *Professor Emeritus*
Peter M. Asbeck, Ph.D.
H. Neal Bertram, Ph.D.
William S. C. Chang, Ph.D.
William A. Coles, 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.
Laurence B. Milstein, Ph.D.
Barnaby J. Rickett, Ph.D.
Manuel Rotenberg, Ph.D., *Chair*
M. Lea Rudee, Ph.D., *Dean, Division of
Engineering*
David Sworder, Ph.D., *Associate Dean, OGSR*
Charles W. Tu, Ph.D.
Andrew J. Viterbi, Ph.D.
Harry H. Wieder, Ph.D.
Jack K. Wolf, Ph.D.

Associate Professors

Clark Guest, Ph.D.
Sadik Esener, Ph.D.
Shaya Fainman, Ph.D.
George J. Lewak, Ph.D., *Professor Emeritus*
Kevin B. Quest, Ph.D.
Bhaskar Rao, Ph.D.
Ramesh Rao, Ph.D.
Anthony Sebald, Ph.D.
Paul Yu, Ph.D.

Assistant Professors

Shankar Chatterjee, Ph.D.
Paul M. Chau, Ph.D.
Teresa L. Cheeks, Ph.D.
Rene L. Cruz, Ph.D.
Ronald D. Fellman, Ph.D.
Karen L. Kavanagh, Ph.D.
Kenneth Kreutz-Delgado, Ph.D.
Ting-Ting Y. Lin, Ph.D.
Edward T. Yu, 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*
 Constantin Politis, Ph.D., *Inst. for Nuclear Solid State Physics, Germany*
 Terrence Sejnowski, Ph.D., *Department of Biology*
 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 that lead to a **B.S. degree** in electrical engineering, computer engineering, or engineering physics.

In the **electrical engineering** program students initially learn the basic engineering concepts in a common curriculum and then must choose one of seven specialized options, corresponding to the major divisions of modern electrical engineering: **communications systems, electronic circuits and systems, electronic circuits and devices, electronic devices and materials, photonics, robotics and control, and systems and control.** The electrical engineering program has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET). The **computer engineering** program treats hardware design, data storage, computer architecture, assembly languages, and the design of computers for engineering, information retrieval, and scientific research. The computer engineering program is conducted jointly with the Department of Computer Science and Engineering. The **engineering physics** program provides a strong background in physics and mathematics and permits specialization in acoustics, optics, solid state electronics, continuum mechanics, or materials science. The program is conducted in cooperation with the Department of Physics and the Department of Applied Mechanics and Engineering Sciences (AMES).

In addition to the B.S. programs, ECE offers programs that lead to the **B.A. degree in applied physics or information science.** These degrees are designed for students who desire more time for undergraduate studies outside their major subject. A range of specializations is available as in the B.S. degrees, but with only fifteen upper-division courses required, there is neces-

sarily less depth in the coverage. Applied physics emphasizes topics such as electromagnetism, electronics, solid state devices, and optical or acoustical information processing. Information science emphasizes communication systems and the processing of information.

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 their first quarter.

Students who maintain a distinguished scholastic record in departmental programs through the junior year are encouraged to apply for the **five-year B.S./M.S. or B.A/M.S. program.** This is accomplished by applying for admission to the graduate program in the spring quarter of the junior year. Students accepted in the program may enroll in graduate courses and can complete the requirements for a master's degree within one year after receiving the bachelor's degree.

B.S. CURRICULA

The B.S. programs have extensive lower-division requirements, in addition to the upper-division requirements, which in electrical engineering and computer engineering are twenty-one courses, and twenty-one to twenty-two courses in engineering physics. For graduation, each student must also satisfy general-education requirements determined by the student's college. In order to graduate in four years with a B.S. degree a student should enroll for approximately eighteen units for three quarters and sixteen units for the nine remaining quarters. Enrolling in Summer Session courses can be of some help in meeting a four-year goal. However, 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 breadth of education. They should realize that some colleges require considerably more courses than others, making it impossible to complete a B.S. program in four years. Students wishing to transfer to another college should see their college adviser. Graduates of junior colleges may enter ECE programs in the junior year. However, transfer students should be particularly mindful of the sophomore-year course requirements when planning their programs. Students are required to discuss their curriculum with the appropriate departmental adviser no later than the spring quarter of their freshman year, and then at least once a year until graduation.

ELECTRICAL ENGINEERING

The electrical engineering curriculum comprises studies in communication systems, electronic circuits and systems, electronic circuits and devices, electronic devices and materials, photonics (or opto-electronic engineering), robotics and control (including intelligent systems), and systems and control. After discussion with a faculty adviser, students should select one of these options. The curriculum in electrical engineering has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc. (ABET).

The following sets of courses are given as four-year programs, with college general-education courses noted as GER. Students who do not adhere to this schedule should consult a faculty adviser to ensure that courses are taken in an appropriate order. There is a common lower-division program that is required for all options.

**Lower-Division Requirements—
All Options**

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A**	Math. 2B	Math. 2C
CSE 65 or 62B	Phys. 2A*	Phys. 2B
Chem. 6A	G.E.R. ⁽¹⁾	Phys. 2BL
G.E.R. ⁽¹⁾	ECE 10	G.E.R. ⁽¹⁾
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C	Phys. 2D	ECE 80 or CSE 70
ECE 50A	ECE 50B	ECE 81 or CSE 170A
ECE 52AL	ECE 52BL	ECE 82 or CSE 175B
Phys. 2CL or 2DL		

*Math. 2A is the prerequisite for Phys. 2A. Students whose performance on the math. placement test permits them to start with Math. 2B or higher may take Phys. 2A in the fall quarter of the freshman year.

**The honors math. sequence can be substituted for Math. 2A-B-C-DA-EA-F.

⁽¹⁾GENERAL-EDUCATION REQUIREMENT

The **upper-division course** requirements depend on the option selected by the student. The following are the requirements for the various options. T.E. denotes a technical elective, which can be any upper-division course chosen with the approval of the faculty adviser—see the section on ECE undergraduate regulations.

Communication Systems Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	ECE 160C
ECE 105A	ECE 171A	T.E.
T.E.		

ENGINEERING: ELECTRICAL AND COMPUTER ENGINEERING

SENIOR YEAR

ECE 154A	ECE 154B	ECE 154C
ECE 159A	ECE 158A	ECE 158B
(ECE 161A or 161C or 162A)		ECE 122
T.E.	T.E.	T.E.

Electronic Circuits and Systems Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 138
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	ECE 160C
T.E.	ECE 171A	
SENIOR YEAR		
ECE 121A	ECE 121B	ECE 121C
ECE 161A	ECE 161B	
	ECE 162A	ECE 161C or 162B
T.E.	T.E.	T.E.

Electronic Circuits and Devices Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	
ECE 160A	ECE 160B	ECE 160C
ECE 135A	ECE 135B	ECE 136B
T.E.	ECE 171A	T.E.
SENIOR YEAR		
ECE 121A	ECE 121B	ECE 121C
ECE 161A	ECE 161B	ECE 161C
T.E.	T.E.	ECE 139
		T.E.

Electronic Devices and Materials Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 105C
T.E.	ECE 171A	T.E.
ECE 160A	ECE 160B	ECE 160C
ECE 135A	ECE 135B	ECE 134
SENIOR YEAR		
ECE 121A	ECE 121B	ECE 121C
ECE 140A	ECE 136B	ECE 139
T.E.	T.E.	T.E.

Photonics Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	T.E.
ECE 135A	ECE 135B	T.E.
ECE 140A	ECE 140B	ECE 140C
SENIOR YEAR		
ECE 141A	ECE 141B	ECE 141C
ECE 121A	ECE 121B	T.E.
(ECE 162A or 136B or 144A)	T.E.	T.E.

Systems and Control Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 171A	ECE 171B
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	ECE 160C
T.E.	T.E.	T.E.
SENIOR YEAR		
ECE 159A	ECE 159B	ECE 159C
ECE 176A	T.E.	ECE 122
ECE 167	ECE 169	T.E.

Robotics and Control Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	T.E.
ECE 152A	ECE 152B	ECE 152C
ECE 160A	ECE 160B	CSE 170B
T.E.	ECE 171A	ECE 171B
SENIOR YEAR		
ECE 176A	ECE 176B	ECE 176C
ECE 172A	ECE 172B	T.E.
ECE 167	(ECE 169 or CSE 175C)	ECE 177

COMPUTER ENGINEERING

Students wishing to take 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.

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.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A	Math. 2B	Math. 2C
CSE 62B or 65*	Phys. 2A†	Phys. 2B
Chem. 6A	Chem. 6B ^{cc}	Phys. 2BL
G.E.R. ⁽¹⁾	ECE 10 or CSE 64	G.E.R. ⁽¹⁾
SOPHOMORE YEAR		
Math. 2D or 2DA	Math. 2EA	Math. 2F
Phys. 2C	Phys. 2D	ECE 80 or CSE 70
ECE 50A	ECE 50B	(ECE 81 or CSE 170A)
		(ECE 82 OR CSE 175B)
ECE 52AL	ECE 52BL	
Phys. 2CL or 2DL		
JUNIOR YEAR		
ECE 152A	ECE 171A	CSE 175C
CSE 160A	CSE 160B	T.E. ⁽²⁾
ECE 105A	CSE 170B	CSE 170C
ECE 160A	ECE 160B	T.E. ⁽²⁾

SENIOR YEAR

ECE 167	CSE 172B	CSE 171B
CSE 161A	CSE 161B	CSE 180
CSE 171A	CSE 163A	T.E. ⁽²⁾

*Please note that CSE 62A is a prerequisite for CSE 62B, and if you have not taken an equivalent course, you will need to start with CSE 62A in the fall and pick up CSE 62B in the winter.

†Math. 2A is the prerequisite for Phys. 2A. Students whose performance on the math. placement test permits them to start with Math. 2B or higher may take Phys. 2A in the fall quarter of the freshman year.

^{cc}A lower-division biology course may be substituted for Chem. 6B.

Physics 4A,B,C,D,E can be substituted for Physics 2A,B,C,D and Chemistry 6B

⁽¹⁾GENERAL-EDUCATION REQUIREMENT

⁽²⁾TECHNICAL ELECTIVES: Any upper-division or graduate course from either the ECE or CSE department may be used as a technical elective.

ENGINEERING PHYSICS

The engineering physics degree combines a strong program in physics with most of the requirements for a B.S. degree in electrical or mechanical engineering. It comprises options in acoustics, optics, continuum mechanics, materials science, and solid state electronics. Any one of these options should be selected by the student; note that these programs may have no technical electives and specify twenty-one to twenty-two upper-division courses. T.E. denotes a technical elective, which can be any upper-division course chosen with the approval of the faculty adviser—see the section on ECE undergraduate regulations.

Lower-Division Requirements—All Options

FALL	WINTER	SPRING
FRESHMAN YEAR		
CSE 65 or 62B	Phys. 2A	Phys. 2B
Chem. 6A	Math. 2B	Phys. 2BL*
Math. 2A	G.E.R. ⁽¹⁾	Math. 2C
G.E.R. ⁽¹⁾	(ECE 10 or 80 or CSE 70)	G.E.R. ⁽¹⁾
SOPHOMORE YEAR		
Phys. 2C	Phys. 2D	G.E.R. ⁽¹⁾
Phys. 2CL*	Phys. 2DL*	G.E.R. ⁽¹⁾
Math. 2DA	Math. 2EA	Math. 2F
ECE 50A	ECE 50B	ECE 81 or CSE 170A
		ECE 82 or CSE 175B

*or ECE 52AL-BL, Phys. 2DL.

⁽¹⁾GENERAL-EDUCATION REQUIREMENT

The upper-division course requirements depend on the option selected by the student. The following are the requirements for the various options.

Acoustics Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	
ECE 152A	ECE 152B or 171A	ECE 152C or 160C
Phys. 110A	Phys. 110B	AMES 110
SENIOR YEAR		
ECE 145AL	ECE 145BL	ECE 145CL
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	Phys. 152
AMES 101A	AMES 101B	

Continuum Mechanics Option

FALL	WINTER	SPRING
JUNIOR YEAR		
AMES 130A	AMES 130B	AMES 130C
ECE 105A	ECE 105B	ECE 105C
(ECE 160A	ECE 160B) or	AMES 110
(AMES 170	AMES 171A)	
(Phys. 110A	Phys. 110B) or	
(AMES 121A	AMES 121B)	
SENIOR YEAR		
AMES 101A	AMES 101B	AMES 101C
Phys. 130A	Phys. 130B	Phys. 152
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 140A	Phys. 140B	

Material Science Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	AMES 102	ECE 137
(Phys. 110A	Phys. 110B) or	ECE 134
(AMES 121A	AMES 121B)	
(ECE 135A or	ECE 135B	ECE 136B
Phys. 152)		
SENIOR YEAR		
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	T.E.
Phys. 140A	Phys. 140B	T.E.

Optics Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	AMES 110
ECE 140A	ECE 140B	ECE 140C
Phys. 110A	Phys. 110B	
SENIOR YEAR		
ECE 141A	ECE 141B	ECE 141C
(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	(Phys. 152 or
		ECE 136B)
ECE 135A	ECE 135B	

Solid State Electronics Option

FALL	WINTER	SPRING
JUNIOR YEAR		
ECE 105A	ECE 105B	ECE 105C
ECE 160A	ECE 160B	ECE 160C
ECE 135A	ECE 135B	ECE 136B
T.E.	ECE 171A	ECE 134

SENIOR YEAR

(ECE 121A	ECE 121B	ECE 121C) or
(Phys. 100A	Phys. 100B	Phys. 100C)
Phys. 130A	Phys. 130B	ECE 161C or 139
Phys. 140A	Phys. 140B	T.E.

THE B.A. CURRICULA

There are majors leading to the B.A. degree in **applied physics** and in **information science**.

LOWER-DIVISION REQUIREMENTS

The lower-division requirements are the same for both applied physics and for information science.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A	Math. 2B	Math. 2C
CSE 65 or 62B	Phys. 2A*	Phys. 2B
Chem. 6A	G.E.R. ⁽¹⁾	Phys. 2BL
G.E.R. ⁽¹⁾	ECE 10	G.E.R. ⁽¹⁾
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C	Phys. 2D	G.E.R. ⁽¹⁾
Phys. 2CL or 2DL		
ECE 50A	ECE 50B	ECE 81 or
		CSE 170A
ECE 52AL	ECE 52BL	ECE 82 or
		CSE 175B

*or Phys. 4A-B-C-D-E

APPLIED PHYSICS

Upper-Division Programs

A total of fifteen upper-division courses, approved as a coherent program by the adviser, must be passed with a minimum 2.0 GPA in order to satisfy the requirements of the major program. Of those fifteen, the following are required of all applied physics majors:

- (a) ECE 105A-B-C
- (b) At least two sequences from the following:
 - ECE 121A-B-C
 - ECE 135A-B, 134
 - ECE 140A-B-C
 - ECE 160A-B-C
- (c) At least eight units of undergraduate laboratory courses selected from the following:
 - ECE 136B, 137
 - ECE 167
 - ECE 141A-B-C
 - ECE 145AL-BL-CL
 - Phys. 121
 - ECE 161A, 161B
 - ECE 160 A-B-C

Electives may be any upper-division physical science or mathematics courses approved by the

adviser. The electives should include at least one three-course sequence. Components of four typical major programs are listed below.

Acoustics

- ECE 105A-B-C, 121A-B-C,
- 145AL-BL-CL,
- 152A-B-C
- AMES 101A-B, AMES 110

Electronics

- ECE 105A-B-C, 121A-B-C, 160A-B-C,
- 135A-B, 171A, 136C,
- Any two of (ECE 161A, 161B, 161C or 162A)

Optics

- ECE 105A-B-C, 121A-B-C,
- 140A-B-C, 141A-B-C,
- (152A-B-C) or (Phys. 130A-B and ECE 135A)

Solid State

- ECE 105A-B-C, 121A-B-C,
- ECE 160A-B-C
- Any one of (ECE 134, 137 or 144A)
- ECE 135A-B, 136B
- Phys. 130A-B

INFORMATION SCIENCE

A total of fifteen upper-division courses, approved as a coherent program by the adviser, must be passed with a minimum 2.0 GPA in order to satisfy the requirements of the major program. Options in communication systems, and systems and control are available. See the electrical engineering program for suggested courses in these options.

MINOR CURRICULA

The following sets of courses represent a variety of minor curricula in the area of electrical engineering and applied physics. A minor will typically consist of one of the following upper-division sequences and three of the lower-division prerequisite courses. Students should note that the upper-division sequences require more than three lower-division 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.

- 1. Digital Hardware ECE 167, 169
- 2. Transistors and Circuits ECE 160A and 138
- 3. Systems ECE 105A, 171A-B
- 4. Signals and Noise ECE 105A, 152A, 152B
- 5. Optics ECE 140A-B, 105A

UNDERGRADUATE REGULATIONS AND REQUIREMENTS

ADMISSION TO ECE MAJORS

Admission to upper-division ECE courses is based on the GPA in required lower-division courses. (See "Admission of Majors in the Division of Engineering" in the Division of Engineering portion of this catalog.) Currently, students who have a 2.0 overall GPA and a C minimum or better in the screening courses are admissible as ECE majors. This GPA cutoff level may be raised at any time, when the number of majors exceeds 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 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.

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 upper-division courses in the major, including the 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.

TECHNICAL ELECTIVES

Any upper-division or graduate course in the ECE, AMES, CSE, physics, or mathematics departments may be selected as a technical elective, with the approval of the student's adviser. However, at most four units of ECE 197, 198, and 199 may be used; these courses may be taken on a Pass/No Pass basis.

ADVISING

Students are required to complete an Academic Planning form and to discuss their curriculum with the appropriate departmental adviser no later than the spring quarter of their freshman year, and then every year until graduation. This is to help both in their choice of option and their choice of technical electives, and to keep them aware of any changes in the requirements. An adviser will be assigned by the ECE department undergraduate office.

THE GRADUATE PROGRAMS

The Department of Electrical and Computer Engineering offers graduate programs leading to **M.S.** and **Ph.D. degrees** in eight areas with the following degree titles: electrical engineering (applied physics), electrical engineering (communication theory and systems), electrical engineering (electronic circuits and systems), electrical engineering (intelligent systems, robotics and control), electrical engineering (computer engineering), electrical engineering (signal and image processing), electrical engineering (photonics), and an interdepartmental curriculum in electrical engineering (applied ocean sciences).

Admission 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 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. Applicants are judged competitively. Based on the applicant's background, qualification and goals, admission to a graduate program is made in one of three categories: M.S. *only*, M.S., or Ph.D. Admission to the M.S. *only* is designated when the applicant's qualifications are judged to be marginal; the M.S. or Ph.D. is designated when the applicant is judged to be appropriately qualified. The latter designations are important to M.S. students who subsequently wish to pursue a Ph.D program (see "Master's Degree Program" below).

APPLIED PHYSICS

This division includes the following areas of study:

Radio and Space Science. Radio science uses a wide variety of ground-based radio observations to remotely probe the ionosphere, the solar wind, and the interstellar medium. On the one

hand the perturbations, caused as radio waves propagate in these irregular and turbulent plasmas, are used to study these regions; on the other hand, such perturbations can distort radio-astronomical observations, and techniques are sought to minimize the distortions and provide 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 are pursued in many aspects of space physics. These include the interaction of the solar wind with the earth, planets and comets; cosmic dusty-plasmas; waves in the ionosphere; 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.

Our Ph.D. graduates in radio and space science are now actively employed in research and engineering in a wide range of industrial, university, and government organizations. Students are trained in one or more of the interrelated fields—electromagnetics, space plasma physics, radio astronomy, wave propagation, numerical methods, and signal processing. Large-scale computational facilities are available in the group and through the San Diego Supercomputer Center. The radio science projects use the national radio-astronomy facilities in addition to a large dedicated array antenna operating at 74 MHz.

Electronic Devices and Materials. The field of electronic devices and materials includes the synthesis, characterization and application of metals, semiconductors and dielectric materials, principally in the form of thin layers. The field of solid state electronics includes the synthesis, construction, evaluation, and modeling of prototype electronic materials and devices and integrated circuits based on silicon and III-V compound semiconductors and processing methods and techniques employed in present-day or projected large-scale integrated circuit applications. Current research includes growth by molecular beam epitaxy and chemical vapor phase epitaxy, the metallurgical aspects of interfaces, the study of superconductors and tunneling phenomena, magnetic materials, and the electronic, optical, and electro-optic properties of heterojunction structures. The department has available a complete facility for fabricating prototype silicon and III-V compound transistors and other devices, a Rutherford back-scattering facility, molecular beam epitaxial apparatus, cryogenic temperature facilities and auxiliary apparatus for x-ray, optical, electro-optic, electrical, and galvanomagnetic characterization of materials, devices, and components.

Applied Optics. The applied optics program complements the photonics program. It concentrates more on studying 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 in III-V semiconductors, semiconductor injection lasers and detectors for optical communication. The applied optics program shares many of the common equipment with the photonics program and the electronic devices and materials program. In addition, the facilities available for microfabrication of opto-electronic circuits and devices include an r.f. and magnetron sputtering system, plasma etching, reactive ion beam etching, plasma enhanced chemical vapor deposition, low pressure chemical vapor deposition.

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 nonlinearities, interferences, and noise.

Current projects involve utilization of the San Diego Supercomputer Center at UCSD to perform numerical simulations of high-density digital recording in metallic thin films, micromagnetic analysis of magnetic reversal in individual magnetic particles again utilizing the Cray, 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.

Facilities for theoretical and experimental research are in the 44,000 square foot Center for Magnetic Recording Research building. Experimental equipment include a large-scale sputterer for disc media preparation, state-of-the-art computer controlled vibrating magnetometer, and precision tape and disc drives for recording studies. The center maintains its own computational facility for use by supported students and faculty.

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 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 multiuser 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. Both the M.S. and the Ph.D. degrees are offered.

ELECTRONIC CIRCUITS AND SYSTEMS

Electronic circuits and systems (ECS) in the Department of ECE involves the study of the analysis, design, and synthesis of electronic circuits and systems. There is emphasis on analog and digital integrated circuits, very large-scale integration (VLSI), analog and digital signal processing, and system algorithms and architectures. The ECS division includes the following areas of study: 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.

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.

COMPUTER ENGINEERING

The computer engineering program, jointly administered between the CSE and ECE departments, offers the M.S. and Ph.D. degrees. Computer engineering explores the engineering analysis and design aspects of algorithms and technology. Specific research areas include computer systems, signal processing systems, multiprocessing, architecture, networks, computer-aided design, fault tolerance, data storage systems, and neuro-computing.

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.

PHOTONICS

In photonics, the strength of optics and electronics are combined to yield powerful opto-electronic systems that cannot be realized with electrons alone. This program at UCSD involves the design, prototyping an application of opto-electronic systems to image processing, parallel computing, and fiber optics communication. It is an interdisciplinary field among optical, electronic, and computer (or communication) scientists and engineers because many important issues in architecture, packaging, and algorithm need be addressed in system design and applications. Current system studies include multi-electronic processors with optical interconnects, opto-electronic neural networks, robotic vision (optical pattern recognition), data/knowledge-base systems with high I/O bandwidth, and digital optical computing systems. The photonics program has available an extensive list of research equipment, e.g., a number of lasers (argon, ti-sapphire, dye, carbon dioxide, helium neon, Nd/YAG, and gallium arsenide), detectors, infrared vidicons, spectrometers, interferometers, several liquid crystal light valves, microchannel spatial light modulators, a Pockels readout optical modulator, a considerable amount of high-quality optics, and more than fifteen vibration-isolation tables. Research facilities include CAD workstations, flip-chip bonder, optical and electron-beam lithography.

APPLIED OCEAN SCIENCES

The Graduate Department of the Scripps Institution of Oceanography, the Department of Electrical and Computer Engineering, and the Department of Applied Mechanics and Engineering Sciences offer an interdepartmental program in applied science related to the oceans. All aspects

of human's purposeful and unusual intervention into the sea are included. Students who enroll will receive the degree of Ph.D. upon completion of normal departmental requirements and certain others stipulated by an interdepartmental faculty committee.

ECE GRADUATE REQUIREMENTS AND REGULATIONS

COURSE AND EXAMINATION REQUIREMENTS

To complete the M.S. program, the course requirements must be satisfied and either a master's thesis must be written (Plan I) or the comprehensive examination must be passed (Plan II).

The course requirements for the Ph.D. program are the same as those for the M.S. The same comprehensive examination is required for the Ph.D. program, but the passing level is somewhat higher. In addition, a departmental research examination must be passed. This is followed by the University Qualifying Examination, the submission of a thesis and a final thesis examination (as described under the "Graduate Studies" section of this catalog).

All core courses in the department must be taken for a letter grade. Seminar courses in the 290 series, Independent Study 298, Research 299, and Teaching 501 must be taken on an S/U basis. Other courses used to fulfill degree requirements may be taken S/U only with the approval of the adviser.

The **comprehensive examination**, which is required for both Plan II M.S. students and for Ph.D. students, is a written exam based on topics appropriate to each discipline, at the advanced undergraduate level. The details of the choice of exam topics and scheduling are available from the ECE graduate office. Incoming graduate students must take the exam before the end of their first year of enrollment. Students with good undergraduate preparation should take it during their first fall quarter. It is also offered in the spring quarter each year. It can be repeated once, but only at the next time it is offered. Students, who are admitted already holding an M.S. degree, must nevertheless pass the comprehensive exam to obtain a second M.S. degree or to proceed toward a Ph.D. Students in the area of intelligent systems, robotics and control are also required to take an oral exam on their graduate course work—see listing below.

Students who were admitted to study for the M.S. only may, upon completion of the requirements of the M.S. (Plan II) program, apply for admission to the Ph.D. program. Their applica-

tions will be judged in competition with those of new students applying for admission to study for the Ph.D. degree. Performance in the core courses and on the comprehensive examination will be taken into account.

DEPARTMENTAL PH.D. TIME LIMIT POLICY

Students must be advanced to candidacy by the end of four years. 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).

FINANCIAL AID

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Half-time research assistants and half-time teaching assistants are paid (slightly different) monthly stipends, with preference given to students in the Ph.D. program. There is also the possibility of employment during the summer months. Application forms for admission and financial support can be obtained from the ECE graduate office.

MASTER'S DEGREE PROGRAMS

The general requirements for the degree of master of science are stated in the "Graduate Studies" section of the catalog. The purpose of the M.S. program is to equip engineers with fundamental knowledge in their fields, to extend an undergraduate background, or to expose practicing engineers to current theories and technologies. The degree may be terminal or may be used as a step toward the Ph.D. Normally no financial support is offered to students enrolled in the M.S. program.

To complete the M.S. program, the course requirements must be satisfied and either a master's thesis (Plan I) must be written or the comprehensive examination (Plan II) must be passed.

The **course requirements** for an M.S. degree are specified below under the various disciplines within the department. Typically, six to nine core courses and technical electives to make up a total of forty-eight units are required (note that this is greater than the thirty-six units required by the university). These requirements are the same for Plans I and II, except in three disciplines (communication theory and systems, electronic circuits and systems, and intelligent systems, robotics and control) for which only forty-four units are required for Plan I students. However, Plan I also requires six units of research with an adviser under ECE 298 or 299.

APPLIED PHYSICS

The M.S. program in electrical engineering (applied physics) includes the fields of radio and space science, electronic devices and materials, applied optics and photonics, and magnetic recording. The program allows the students to deepen their understanding in the field of their choice.

Course Requirements

The following core courses are required:

Math. 210A-B-C or AMES 294A-B-C

And any two sequences (twenty-four units) selected normally from the following:

ECE 222A-B-C

ECE 230A-B-C

ECE 240A-B-C

ECE 245A-B-C

ECE 251A-B-C

Phys. 211, Phys. 212A-B

In addition, elective courses to complete a total of forty-eight units must be taken.

COMMUNICATION THEORY AND SYSTEMS

The M.S. program in communication theory and systems stresses the principles underlying the analysis and design of modern communication, remote-detection, and image-processing systems. Plan II students with a good undergraduate background can complete the course and exam requirements in one year of full-time study.

Course Requirements

The following courses are required:

ECE 250A, ECE 256A

Also one sequence from Group A and any two quarter-courses from Group B:

Group A

ECE 257A-B

ECE 258A-B

Any two quarters of ECE 259A-B-C

Group B

ECE 253A-B

ECE 254A

ECE 250B

ECE 251B-C

ECE 256B

In addition, Plan I students must take five technical electives and Plan II students must take six. These electives must be chosen among graduate ECE, CSE, AMES, mathematics, and physics courses; ECE 159A is admissible.

Comprehensive Examination

The comprehensive examination is on upper-division undergraduate material in applied mathematics, communication theory, linear systems, probability, and random processes.

ELECTRONIC CIRCUITS AND SYSTEMS

The M.S. program in electronic circuits and systems offers interdisciplinary flexibility in the areas of research related to electronics. The fields of specialties include signal processing, VLSI design of ASICs, MIMIC design, parallel and multiprocessing, neural networks, fault-tolerant and reliable digital systems, computer-aided design, and computer-aided engineering.

Course Requirements

Two A-B-C sequences that make up the core courses (twenty-four units) must be selected from the following:

ECE 230A-B-C

ECE 260A-B-C

ECE 222A-B-C

ECE 251A-B-C

ECE 263A-B-C

ECE 270A-B-C

Elective courses to complete the total of forty-eight units must be taken by Plan II students and forty-four units by Plan I students.

INTELLIGENT SYSTEMS, ROBOTICS AND CONTROL

The M.S. program in intelligent systems, robotics and control stresses the integration of computers and mathematics for use in the analysis and control of complex, uncertain systems. Students with a good undergraduate background can complete the M.S. Plan II program in one year of full-time study.

Course Requirements

Two sequences (twenty-four units) must be selected from the following core sequences:

ECE 251 A-B-C

ECE 271 A-B-C

ECE 250A, ECE 272A-B

ECE 273 A-B-C

ECE 275, ECE 274A-B

ECE 172A-B

In addition, Plan I students must take five technical electives and Plan II students must take six. These electives must be chosen among graduate ECE, CSE, AMES, mathematics, and physics courses. A student may select one sequence (twelve units) at the 100-level to satisfy

this requirement. Specific core courses and elective courses must be approved by the graduate adviser.

Comprehensive Examination

A comprehensive examination on upper-division undergraduate areas is given in the fall and spring quarters. Students must take the section on probability/random processes and choose one additional topic from either control theory or signal processing.

Plan II students must also pass an oral exam on one of the graduate core sequences.

COMPUTER ENGINEERING

The program is administered jointly with the Department of Computer Science and Engineering. The M.S. degree entails forty-eight units of work; students may elect the thesis option Plan I or comprehensive examination Plan II. Prepared students can complete the program in one year of full-time study.

Course Requirements

Core courses are required from the following three groups

1.) Three Software Courses:

CSE 264B: Operating Systems

CSE 268A or 279: Algorithms

CSE 264C: Programming Languages

2.) Three Hardware Courses:

CSE 270A: Architecture

ECE 260A: VLSI

and one of the following:

ECE 251A: Digital Signal Processing

ECE 263A: Fault-Tolerant Design

CSE 281V: Computer-Aided Design

3.) Two Theory Courses:

CSE 265B or CSE 261: Computation

ECE 257A or CSE 281L: Networks

Students in either plan must elect twelve technical units among graduate courses within the Departments of AMES, CSE, ECE, Mathematics, and Physics. The number of research technical elective units included among the sixteen varies with the department.

Comprehensive Examination

The Plan II comprehensive examination consists of two parts. In the first part, two of the four core areas covered in the CSE comprehensive examination are chosen from among the following CSE topics:

Operating Systems

Algorithms

Programming Languages

Architecture
Computation

The second part consists of the Applied Mathematics (ECE 105A-B-C) and one other area chosen from the following list:

Digital Signal Processing
Very Large-Scale Integration (VLSI/CE)
Probability
Random Processes
Electronics
Linear Systems

The examination covers these topics at the advanced undergraduate level. Examinations are given in the fall and spring quarters and must be taken during the first year of graduate study. Students who are unable to attain a satisfactory score in their first attempt and who wish to try again must retake the examination the next time it is offered.

A student admitted to the M.S. Plan II program, upon completing the requirements for the M.S. degree, may apply for admission to the Ph.D. program. Performance in the core courses and on the M.S. comprehensive examination will be taken into account.

SIGNAL AND IMAGE PROCESSING

The M.S. program in electrical engineering (signal and image processing) entails forty-eight units of course work. To complete the program, a student must satisfy the course requirements and either write a master's thesis (Plan I) or pass the comprehensive examination (Plan II). Students with a good undergraduate background can complete the program in one year of full-time study.

Course Requirements

Students must complete the following courses:

ECE 250A
ECE 251A-B
ECE 275

In addition, a student must take at least twelve units from the following:

ECE 251C
ECE 253A-B-C
ECE 256A-B
ECE 260A-B-C
ECE 240B-C, ECE 241C
ECE 270A-B-C
ECE 271A-B-C
Math. 270A-B-C

In addition, students must take technical electives to complete the total units requirement. These electives must be chosen among graduate ECE, CSE, AMES, mathematics, and physics courses, and be approved by the adviser. A

student may select one sequence (twelve units) at the 100-level courses to satisfy this requirement.

Comprehensive Examination

The comprehensive examination based on upper-division undergraduate areas is given in the fall and spring quarters. It must be taken during the first year of graduate study, and the student must pass the exam in four areas of his or her choice.

PHOTONICS

The M.S. program in electrical engineering (photonics) stresses the design, prototyping, and application of an opto-electronic computing or communication system. Plan II students with a good undergraduate background can complete the course and exam requirements in one year of full-time study.

Course Requirements

The following core course is required:

ECE 240A-B-C

And twenty-four additional units selected from the following:

Math. 210A-B-C
ECE 230A-B-C
ECE 241A-B-C
ECE 251A-B-C
ECE 253A-B-C
ECE 257A-B
ECE 258A-B
ECE 259B
ECE 260A-B-C
ECE 263A
ECE 270A-B-C
CSE 264A
CSE 268A
CSE 270A
CSE 281U-V

Students must take technical electives to complete the total of forty-eight units required. These electives must be chosen among graduate ECE, CSE, math., and physics courses and approved by the adviser. A student may select one sequence (twelve units) at the 100-level courses to satisfy this requirement.

Comprehensive Examination

The comprehensive examination is on upper-division undergraduate material. A student must pass the exam in four areas of his or her choice, including optical engineering. Some areas in computer science and engineering are among the choices possible.

THE DOCTORAL PROGRAMS

The requirements for the electrical engineering Ph.D. program include the same course requirements as for the M.S. degree and the same comprehensive examination. Students admitted to the Ph.D. program, who already hold an M.S. degree in electrical engineering, must nevertheless satisfy the requirements for the core courses. Graduate courses taken elsewhere can be substituted for specific courses if approved by the appropriate ECE graduate adviser. In their second year, Ph.D. students should find a **research adviser** and devote at least half of their time to research.

Following completion of their course requirements and comprehensive exam, students in the Ph.D. program should devote themselves to full-time research (under ECE 299) and within one year they must pass a departmental **research exam**. This is an oral exam in which the student presents his or her research to a committee of three ECE faculty members.

Having satisfied the departmental graduate requirements, Ph.D. students should start to define their thesis research. Within the time limits given under regulations above, they will select a doctoral committee to which they present their proposed thesis research (called the **university qualifying exam** or **candidacy exam**). At this point they have been accepted as candidates for the Ph.D. Students who have satisfied these departmental graduate requirements may register for any ECE course on a satisfactory/unsatisfactory basis.

To complete their degree, candidates for the Ph.D. will write a **dissertation** and defend it in a final oral examination conducted by the same doctoral committee.

APPLIED PHYSICS

The various fields of study were described under the "Graduate Programs in Electrical Engineering (Applied Physics)" section. The course and examination requirements are as listed for the M.S. program under "Electrical Engineering (Applied Physics)." After enrolling in the Ph.D. program, a student must obtain an ECE faculty adviser; this will either be a research adviser or the faculty adviser for applied physics for students without a research adviser. The core and elective courses must be chosen with the approval of the adviser.

COMMUNICATION THEORY AND SYSTEMS

Students who do not hold the degree of M.S. in electrical engineering must pass at least five graduate courses during the first year of full-time study. Students who already hold the degree of

M.S. in electrical engineering must take eight graduate courses during the first year. Upon the approval of the graduate adviser, graduate courses taken elsewhere could count towards fulfillment of this requirement.

All students admitted to study for the Ph.D. must attain a cumulative grade-point average of 3.4 in the graduate courses.

ELECTRONIC CIRCUITS AND SYSTEMS

After enrolling in the Ph.D. program, a student must obtain an ECE faculty adviser. The chosen core and elective courses must be approved by the adviser. The course requirements are as for the M.S. program in electrical engineering (electronic circuits and systems).

INTELLIGENT SYSTEMS, ROBOTICS AND CONTROL

Students who have been admitted to study for the Ph.D. degree in the intelligent systems, robotics and control program, but do not hold the degree of M.S. in electrical engineering, will be enrolled in the M.S. (Plan II) program upon entrance. Upon completion of its requirements, which must be accomplished within two years of full-time study, these students will be enrolled in the Ph.D. program.

Students admitted to study for the Ph.D. and already holding the degree of M.S. in electrical engineering will be enrolled in the Ph.D. program upon entrance. They must take the comprehensive examination in two areas (probability/random processes and either control theory or signal processing) during the first year. All students admitted to study for the Ph.D. must attain a cumulative grade-point average of 3.4 in the graduate courses.

Upon enrollment in the Ph.D. program, a student must secure a faculty adviser. Within two years after enrollment in the Ph.D. program, the student must pass an oral graduate comprehensive examination. This exam is based on four graduate sequences (forty-eight units), of which at least two must be from the core sequences (listed under the M.S. program). One of the four topics on the exam may be replaced by achieving an A in each quarter of one of the graduate sequences.

COMPUTER ENGINEERING

Students who have been admitted to the Ph.D. program in computer engineering, but who do not hold a M.S. degree, will be enrolled in the M.S. (Plan II) program. Upon completion of its requirements, which must be accomplished within the equivalent of full-time study of two

years, these students will be enrolled in the Ph.D. program. They must pass at least five graduate courses during their first year of full-time study.

Students admitted to study for the Ph.D. who already hold a M.S. degree will be enrolled in the Ph.D. program upon admission. They must complete the M.S. (Plan II) core course requirements and take the comprehensive examination during the first year. They must pass eight graduate courses during the first year of study.

All students admitted to the Ph.D. program must maintain a cumulative grade-point average of 3.4 in the core courses.

A student must obtain a faculty adviser from either the ECE or CSE department, and as soon as fulfillment of the course requirements is well under way, the student should begin a research project. Within two years after enrollment in the Ph.D. program the student must pass the research examination, in which the student reports on his or her research project and is questioned to determine the depth of understanding of the field of research.

SIGNAL AND IMAGE PROCESSING

Students who have been admitted to study for the Ph.D. degree in the signal and image processing program but do not hold the degree of M.S. in electrical engineering, will be enrolled in the M.S. (Plan II) program on entrance. Upon completion of its requirements, which must be accomplished within two years of full-time study, these students will be enrolled in the Ph.D. program.

Students admitted to study for the Ph.D. and already holding the degree of M.S. in electrical engineering will be enrolled in the Ph.D. program upon entrance. They must take the M.S. comprehensive examination during the first year. All students admitted to study for the Ph.D. must attain a cumulative grade-point average of 3.4 in the graduate courses.

Upon enrollment in the Ph.D. program a student must secure a faculty adviser and as soon as possible begin a research project. Within two years after enrollment in the Ph.D. program, the student must pass the research examination, in which the student reports on the research project and is questioned to determine his or her understanding of the field of research.

PHOTONICS

The course and comprehensive examination requirements are as listed for the M.S. program under photonics. After enrolling in the Ph.D. program, a student must obtain an ECE faculty adviser; this will either be a research adviser or the

faculty adviser for the photonics, students without a research adviser. The core and elective courses must be chosen with the approval of an adviser.

APPLIED OCEAN SCIENCES

The applied ocean sciences program is an interdepartmental program administered jointly with SIO and AMES. Students should go to the SIO graduate office to obtain information on advisers and to check the requirements.

Core Courses

Math. 210A-B-C or AMES 294A-B-C, SIO 210A, 240, 260, 280, and one additional three-course sequence listed under "Core Courses" for electrical engineering (applied physics) or electrical engineering (communication theory and systems). Continuing enrollment in the Applied Ocean Science Seminar (SIO 208) is required.

Comprehensive Examination

Students are required to pass the written applied ocean science examination covering the applied ocean sciences core courses. The examination is given during the second year. Upon successful completion of the written examination, the student will be given an oral examination by an interdepartmental committee composed of two ECE faculty members and one faculty member from SIO or AMES.

Courses

The department will endeavor to offer the courses as outlined below; however, unforeseen circumstances sometimes mandate a change of scheduled offerings. Students are strongly advised to check 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*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

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

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and thermal pollution (effects of CO₂, 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 of how we create automated machines and computing systems to help us function in our environment. Topics include: the design and application of analog and digital electronic systems, the evolution of computers and how they function. Three hours of lecture. *Prerequisite: none.* (W) R. Fellman

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 lecture. *Prerequisite: none.* (S) S.S. Lau, K. Kavanagh, or P. Yu

10. Introduction to Scientific Programming (4)

Introduction to digital computation and numerical methods. The UNIX operating system and FORTRAN 77. Symbol manipulation, simulation, design of subroutines, numerical solution of simple algebraic and differential equations. Special attention given to problems encountered in circuit analysis and design. Three hours of lecture. *Prerequisites: Math. 2B or equivalent, CSE 62B or 65 with grades of C- or better, or concurrent enrollment in Math. 2B, CSE 62B, or 65.* (W) K. Quest

50A. Circuits and Systems (4)

Physical behavior of circuit elements—resistance, capacitance, inductance and mutual inductance; reference directions for voltage-current relationships; Kirchhoff's voltage and current laws; source transformations; loop and node analysis; initial conditions; classical solution of systems of differential circuit equations; the Laplace transform; inverse transform; partial fraction expansions. Three hours of lecture, one hour discussion. *Prerequisites: Grades of C- or better in Math. 2B and Phys. 2B or 3B (may be taken concurrently).* (F) R. Lugannani

50B. Circuits and Systems (4)

Solution of network equations using Laplace transforms; convolution integral; the concept of complex frequency; impedance of circuit elements; series and parallel combinations of impedances; Thevenin's and Norton's theorems; driving point and transfer functions; poles and zeroes of driving point impedances and transfer functions; two-port networks. Three hours of lecture, one hour discussion. *Prerequisites: Grades of C- or better in ECE 50A and Math. 2DA (may be taken concurrently).* (W) R. Lugannani

52AL. Elementary Circuits Laboratory (2)

Circuit elements and their ratings. Use of oscilloscope, function generator, and multimeter. Characteristics and application of simple filters. Analysis of circuit behavior in the time and frequency domains. One hour discussion, three hours of laboratory. *Prerequisite: Phys. 2B with a grade of C- or better or equivalent.* (F) M. Rotenberg

52BL. Elementary Circuits Laboratory (2)

Characteristics and use of operational amplifiers and diodes. Various applications of these components are examined: comparators, linear and logarithmic amplifiers, integrators, differentiators, unregulated and regulated power supplies. One hour discussion, three hours of laboratory. *Prerequisite: ECE 52AL with a grade of C- or better.* (W) M. Rotenberg

80. Introduction to Computer Engineering (4)

This course is designed to introduce the fundamentals in both the hardware and software in a computing system. Topics include the representation of information, computer organization and design, combinational and sequential logic, microprogramming, and current technology in logic designs. Three hours of

lecture. *Prerequisite: CSE 62B or 65 with a grade of C- or better, or knowledge of high-level programming.* (F,S) T.T. Lin and R. Fellman

81. Digital Systems (4)

Design of digital electronic systems. Topics include Boolean algebra, logic minimization, combinational and sequential logic design. Circuits to be discussed include logic gates, flip-flops, registers, and counters. Three hours of lecture, one hour discussion. *Prerequisites: grades of C- or better in ECE 50B, ECE 80, or CSE 70 (may be taken concurrently).* (Students who have taken CSE 170A may not take ECE 81 for credit.) (S) C. Guest

82. Elementary Digital Laboratory (2)

Review of Boolean algebra. Digital logic and integrated circuits: logic gates, trigger circuits, flip-flops, frequency dividers, counters. CMOS technology is used throughout. One hour discussion, three hours of laboratory. *Prerequisite: a grade of C- or better in ECE 52BL, ECE 81 (may be taken concurrently).* (Students who have taken CSE 175B may not take ECE 82 for credit.) (S) M. Rotenberg

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

104. Numerical Methods in Electrical Engineering (4)

Introduction to applied numerical methods for solution of electrical engineering problems. Iterative solutions of nonlinear equations; matrix methods and solution of multi-loop circuit equations; filtering, smoothing, spline fits and interpolation of laboratory data; numerical differentiation and integration. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites: CSE 62A or equivalent, ECE 50A or equivalent with grades of C- or better, and knowledge of Fortran 77 recommended.* (S) K. Quest

105A. Complex Variables and Transform Analysis (4)

Functions of a complex variable, integration of a function of a complex variable, singularities, and residues. Infinite series for functions of a complex variable. Z-transforms. Discrete and continuous time Fourier series and transforms. Linearity, causality and time invariance. Convolutional integral. Eigenfunctions. Transform analysis. Modulation and sampling. Three hours of lecture, one hour discussion. *Prerequisites: Math. 2A-2F, ECE 50A,B with grades of C- or better.* (F) R. Cruz

105B. Introduction to Mathematical Physics (4)

Differential equations, Frobenius' method, exceptional cases, Bessel, Legendre, and hypergeometric equations and functions. Boundary value problems; the Sturm-Liouville problem, generalized Fourier series. Vector analysis: vector algebra, differentiation of vectors, the vector operator ∇ , gradient, divergence and curl operators, the theorems of Gauss, Stokes, and Green. Three hours of lecture, one hour discussion. *Prerequisite: ECE 105A with a grade of C- or better.* (W) A. Mendis

105C. Introduction to Mathematical Physics (4)

Topics in higher dimensional calculus: partial differentiation; implicit functions; functional dependence; Jacobians; Lagrange multipliers; calculus of variations and its applications, differentiation of integrals. Methods for solving partial differential equations: Laplace's equation, Poisson's equation, the wave equation and the Klein-Gordon equation, heat conduction and mass diffusion equations and the telegraph equation. Three hours of lecture, one hour discussion. *Prerequisite: ECE 105B with a grade of C- or better.* (S) A. Mendis

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 unmagnetized planets (and comets). Three hours of lecture. *Prerequisites: Phys. 2A,B or 4A,C and Math. 2A,B with grades of C- or better (Phys. 2C and Math. 2C recommended).* (S) K. Quest

121A. Electromagnetism (4)

Electrostatics and magnetostatics. Electrodynamics. Maxwell's equations: integral and differential forms, simple plane waves, quasi-static approximations. The Poynting vector. Skin effect, the electromagnetics of circuits. Transmission lines: reflection and transmission at discontinuities, matching problems. Three hours of lecture, one hour discussion, one hour lab. *Prerequisites: Math. 2F, Phys. 2B-C (or 4C-D), ECE 105B with grades of C- or better.* (F) B. Rickett

121B. Electromagnetism (4)

Lossy transmission lines, dispersion, group velocity. Plane waves, reflection and transmission at interfaces. Electromagnetic power, energy and Poynting's theorem. Boundary value problems. Guided waves: TEM, TE and TM modes, coaxial lines, microstrip, waveguides, optical fibers. Resonant structures, Q-factor. Transmission line circuits. Coupled lines. Three hours of lecture, one hour discussion, one hour lab. *Prerequisite: ECE 121A with a grade of C- or better.* (W) B. Rickett

121C. Electromagnetism (4)

The magnetic vector potential, electric dipole radiation, duality, magnetic dipole. Spherical harmonics. Far field radiation from electric and magnetic sources. Antenna gain and radiation patterns, reciprocity, antennas in reception, polarization. Diffraction, slots, horns. Antenna arrays, self and mutual impedances. Numerical methods for antennas. Three hours of lecture, one hour discussion, one hour lab. *Prerequisite: ECE 121B with a grade of C- or better.* (S) B. Rickett

122. Electromagnetic Wave Propagation (4)

Transmission lines, impedance matching, attenuation, and dispersion. Electromagnetic fields, Maxwell's equations, plane waves. Dielectric guides, optical fibers. Radiation and antennas. Students may not receive credit for both ECE 121B and ECE 122. Three hours of lecture, one hour discussion. *Prerequisites: Math. 2F, Phys. 2B-C (or 4C-D), ECE 50A-B, ECE 105A with grades of C- or better.* (S) B. Rickett

133. 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 powder techniques, electron diffraction and radial distribution analysis. Four hours of lecture. *Prerequisite: consent of instructor.* (See also "Materials Science Program" section.) (Offering depends on enrollment; check with department.) Staff

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 and 2D with grades of C- or better.* (S) K. Kavanagh

135A. Semiconductor Physics (4)

Review of quantum theory, crystalline lattices, band theory of solids, electron statistics, carrier motion in semiconductors, junction theory, semiconductor devices related to p-n junction diodes. Three hours of lecture. *Prerequisites: Phys. 2D or 4E with a grade of C- or better and ECE 105A concurrently.* (F) H-L. Luo

135B. Transistor Physics (4)

Physics of semiconductor devices, mainly bipolar junction transistors (BJT), field-effect transistors (FET), and metal-oxide-semiconductor transistors (MOS). Discussion of general characteristic equations, device parameters, and various models. Three hours of lecture. *Prerequisite:* ECE 135A with a grade of C- or better. (W) C. Tu

136A. 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. *Prerequisites:* ECE 135A-B with a grade of C- or better. (S) P. Yu

136B. Microelectronics Laboratory (4)

This course is designed to provide laboratory training for students who are interested in the fabrication of semiconductor devices. Lectures will be combined with laboratory to cover photolithography, oxidation, diffusion, thin film deposition, etching and evaluation of devices such as diodes, bipolar transistors, and field effect transistors. *Prerequisites:* ECE 135A-B with grades of C- or better; 136A recommended. (F,W,S) W. Chang or S.S. Lau

136C. Optoelectronic Circuit Design Laboratory (4)

Design, fabrication, and evaluation of optoelectronic circuits, involving optical and electronic devices as well as optical fiber and microwave transmission lines. Lectures will be combined with laboratory to cover the basic operating principles of circuit element and system requirements. Two hours of lecture, six hours of laboratory. *Prerequisites:* ECE 135A-B and ECE 121B with grades of C- or better. Department stamp required. (F) P. Yu and W. Chang

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

138. Introduction to Semiconductor Devices (4)

Introduction to electronic properties of semiconductors, principles and properties of p-n junction diodes, bipolar and field effect transistors, equivalent circuit representation of devices. This course cannot be taken if credits were received for ECE 135A and 135B. Three hours of lecture. *Prerequisites:* Phys. 2D or 3D, ECE 50A-B with grades of C- or better. (S) W. Chang

139. Semiconductor Device Modeling and Design (4)

Device physics of modern FET and bipolar transistors, including behavior of submicron structures. Integrated circuit fabrication. Relationship between structure and circuit models of transistors. CMOS and BiCMOS circuits. Emphasis on computer simulation of transistor fabrication, operation, and application in integrated circuits. Three hours of lecture. *Prerequisites:* ECE 135A-B and ECE 160A with grades of C- or better. (S) P. Asbeck

140A. Quantum Electronics (4)

Introduction to quantum electronics, based on quantum mechanics. Interaction of optical radiation with atomic systems. Applications to light sources (lasers, light-emitting diodes), photodetectors, periodic media. Three hours of lecture. *Prerequisites:* Math. 2DA, Phys. 2C and 2D (or 4C, 4D, and 4E) with grades of C- or better. (F) C. Tu

140B. Optical Engineering I (4)

Fourier optics. Two-dimensional Fourier transforms and angular spectrum of plane waves. Fresnel transform and spherical waves. Elements of information processing using coherent and

incoherent light. Optical and computer-generated holography. Diffractive optics. Three hours of lecture. *Prerequisites:* ECE 140A, ECE 105A with grades of C- or better; concurrent registration in ECE 105B recommended. (W) S. Lee and S. Fainman

140C. Optical Engineering II (4)

Geometrical optics. Ray tracing. Electro-optic and acousto-optic modulation and scanning. Holographic scanners. Computer-aided design of optical systems. Three hours of lecture. *Prerequisites:* ECE 140A,B with grades of C- or better; concurrent registration in ECE 105C recommended. (S) C. Guest

141A. Lasers and Holography Laboratory (4)

Laser resonator design, construction, alignment, characterizations. Operation and evaluation of molecular, gas, liquid dye, semiconductor lasers. Spatial and temporal coherence measurements. Design and fabrication of transmission, reflection, bleached, color, multiple exposure holograms. Two hours of lecture, eight hours of laboratory. *Prerequisites:* ECE 140A-B-C with grades of C- or better or consent of instructor. (F) S. Lee and Y. Fainmam (Cojoint for undergraduate and graduate students/241AL.)

141B. Optical Signal Processing Laboratory (4)

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. Two hours of lecture, eight hours of laboratory. *Prerequisites:* ECE 140A-B-C with grades of C- or better or consent of instructor. (W) Y. Fainman or S. Lee (Cojoint for undergraduate and graduate students/241BL.)

141C. Optoelectronics and Communications Laboratory (4)

Operation and characterization of electro-optic, acousto-optic modulators. Polarization manipulation techniques. Heterodyne detection schemes. Parametrization of P-I-N and avalanche detectors, LED sources. Evaluation of optical fiber, thin film waveguide properties. Characterization of Hughes LCLV spatial light modulator. Two hours of lecture, eight hours of laboratory. *Prerequisites:* ECE 140A-B-C with grades of C- or better or consent of instructor. (S) S. Esener and Y. Fainman (Cojoint for undergraduate and graduate students/241CL.)

144A. Introduction to Robotic Vision

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. *Prerequisites:* ECE 170A, 105A with grades of C- or better, and some computer programming experience. (S) S. Fainman

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. *Prerequisites:* concurrent enrollment in ECE 121A or consent of instructor. (F-W-S) J. Hildebrand

146. Fundamentals of Magnetic Recording (4)

Basic theoretical concepts of the magnetic recording process. Magnetostatic fields from magnetized media and heads; 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; signal to noise ratios and system error rate analysis. Three hours of lecture. *Prerequisites:* ECE 105A,B and 121A with grades of C- or better. (W) N. Bertram

147. Magnetic Recording Laboratory (4)

Basic measurements in magnetic recording. FFT spectral analysis. The use of measurements and the theory from ECE 146 to investigate magnetization processes in heads and magnetic media. Topics include: fields and Fourier transforms of head structures; inductance and B-H loop of recording heads and head core materials; recording system calibration. One hour lecture, seven hours of lab. *Prerequisites:* ECE 146 with a grade of C- or better and laboratory experience. (S) N. Bertram

152A. Probability and Random Processes for Engineers (4)

Introduction to probability theory. Random variables, conditional and unconditional distribution functions, characteristic functions, moments, transformation of random variables. Sequences of random variables. *Prerequisite:* ECE 105A concurrently. (F) R. Rao

152B. Probability and Random Processes for Engineers (4)

Random processes. Stationary processes: correlation, power spectral density. Gaussian processes and linear transformation of Gaussian processes. Point processes. Random noise in linear systems. *Prerequisite:* ECE 152A with a grade of C- or better. (W) R. Rao

152C. Kalman and Wiener Filtering (4)

Minimum and linear mean square estimators and their properties, orthogonality principle, design and experiments (computer simulations) with linear estimators, discrete time Kalman filters (KF), and applications, steady state KF, design and experiments with KF, KF based on continuous time state and discrete measurement model, continuous time KF, Wiener filtering and relationship to KF. *Prerequisites:* ECE 151A-B with grades of C- or better. (S) B. Rao

154A. Communications Systems (4)

Review of stochastic processes including correlation functions and power spectral densities. Orthogonality principle and optimum linear mean-square estimation, including solution of Wiener-Hopf equation. Description of analog modulation systems including AM, SSB, DSB, VSB, FM, and PM. *Prerequisites:* ECE 152A-B with grades of C- or better. (F) L. Milstein

154B. Communications Systems (4)

Analysis of analog modulation systems in the presence of noise, including both coherent and noncoherent demodulation and including threshold effects in FM. Analysis of performance of digital modulation techniques, including probability of error results for PSK, DPSK, and FSK. Introduction to effects of intersymbol interference and fading. *Prerequisite:* ECE 154A with a grade of C- or better. (W) L. Milstein

154C. Communications Systems (4)

Detection and estimation theory including optimal receiver design and maximum-likelihood parameter estimation. Introduction to information theory and coding, including entropy, average mutual information, channel capacity, and block codes. *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 152A-B-C 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 152A-B-C with grades of C- or better and concurrent registration in ECE 154B-C required. Department stamp required. (W,S) J. Wolf

158A. Data Networks (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 lab. *Prerequisites:* ECE 152A, B or equivalent, ECE 159A with grades of C- or better. (W) R. Rao

158B. Data Networks (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 lab. *Prerequisite:* ECE 158A with a grade of C- or better. (S) R. Cruz

159A. Queuing Systems (4)

Analysis of single- and multi-server queuing systems; queue size and waiting lines. Modeling of telephone systems, interactive computer systems and the machine repair problems. Three hours of lecture. *Prerequisite:* ECE 152B or Math. 180A with a grade of C- or better. (F) E. Masry

159B. Queuing Systems (4)

Queues in tandem. Priority scheduling, computer systems application; time-sharing scheduling, modeling and performance of interactive multiprogrammed computer systems. Three hours of lecture. *Prerequisite:* ECE 159A with a grade of C- or better. (W) E. Masry

159C. Queuing Systems (4)

Computer systems modeling: a case study. Elements of computer-communication networks; delay analysis, capacity and flow assignments, random access techniques. 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

160A. Electronic Circuits and Systems I (4)

Nonlinear active circuit design. Nonlinear device models for diodes, bipolar and field-effect transistors. Large signal analyses of circuits such as digital inverters, current sources, and buffers. Linearization of device models and small signal equivalent circuits. Biasing and small signal models for circuits such as common emitter stages and emitter-coupled pairs. Dynamic response of digital circuits, bandwidth of analog circuits. Circuit designs will be simulated by computer and tested in the laboratory. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 50A,B, ECE 170A, ECE 52AL,BL, ECE 175B with grades of C- or better. (F) W. Coles

160B. Electronic Circuits and Systems II (4)

Analysis and design of digital integrated electronic circuits and subsystems for LSI and VLSI Systems. Analytical methods for obtaining static and dynamic characteristics will be stressed. Application of MOS field-effect transistors and bipolar junction transistors to circuits such as combinational logic gates, regenerative logic circuits (flip-flops; Schmidt-triggers, mono and astable multivibrators), datapaths (shift registers, FIFOs, STACKS), programmable logic arrays, memory elements (RAMs, ROMs, EPROMs, CAMs). GaAs devices and circuits will be introduced. Circuits will be simulated by computer and tested in lab. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 170A, 175B, ECE 80 (or CSE 70), ECE 160A with grades of C- or better. (W) S. Esener

160C. Electronic Circuits and Systems III (4)

Analysis and design of analog electronic circuits and systems. Ideal and practical operational amplifiers and circuits. Feedback systems, applications to operational amplifier circuits. Stability, sensitivity, bandwidth, compensation. Design of active filters, state-variable realizations, Sallen-Key realizations, multiple-

feedback infinite-gain realizations. Switched capacitor circuits. Phase-locked loops. Analog-to-digital and digital-to-analog conversion. Circuit designs will be simulated by computer and tested in the laboratory. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 160A, 171A with grades of C- or better. (S) W. Coles

161A. Analog Integrated Circuit Design (4)

Design of linear and nonlinear analog integrated circuits in bipolar and MOS technologies. Linear circuits include video amplifiers, operational amplifiers, voltage regulators, drivers, and power stages. Nonlinear circuits include oscillators and multipliers. Use of feedback at the circuit level. Effects of circuit design on noise performance. Parasitic effects and limitations in integrated circuit design. In addition, basic A/D and D/A converters will be discussed. Circuit designs will be simulated by computer and tested in the laboratory. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 160C, 171A with grades of C- or better. *Recommended:* ECE 135A, 152B. (F) R. Fellman

161B. Digital Integrated Circuit Design (4)

Advanced circuits and subsystems for MOS LSI and VLSI Digital Systems Design. Advanced circuit characterization and performance estimation and optimization. Impact of technology scaling. Circuit design for alternative logic styles (static, dynamic, pass transistor, domino, clocked) and alternative clocking schemes (synchronous mono, 2/4/multiphase, asynchronous). Subsystem design include arithmetic (adders, comparators, multipliers), ALUs and counters, memory systems, regular iterative arrays, and PLAs. Introduction to VLSI design techniques for gate arrays, PLDs, standard cell and custom design. Subsystems will be designed and simulated using CAD tools. Cross-listed with CSE 172A. Three hours of lecture, one hour recitation, and three hours of lab. *Prerequisites:* ECE 160B or CSE 170A,B with grades of C- or better. (W) P. Chau

161C. Microwave Systems and Circuits (4)

Waves, distributed circuits and scattering matrix methods. Detection and frequency conversion using microwave diodes. Design of transistor amplifiers including noise performance. Analysis of simple antenna systems. Circuit designs will be simulated by computer and tested in the laboratory. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 121A-B, ECE 160A with grades of C- or better. (S) W. Coles

162A. Electronic Signal Processing I (4)

Design of linear filters in continuous and discrete time. Approximation of specifications by rational functions. Mapping low-pass prototypes to high-pass, band-pass, etc. Sensitivity analysis. Design of digital FIR, IIR, and frequency domain filters. Digital correlation and convolution (linear and cyclic). Finite word length effects and limit cycles. Decimation and interpolation. Fast Fourier transform (FFT) algorithms. Structures for discrete time system implementation. Algorithms will be simulated by computer and tested in laboratory. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 160A,B,C with grades of C- or better. (W) R. Fellman

162B. Electronic Signal Processing II (4)

Basic principles of adaptive algorithms. Algorithms for adaptive FIR (search techniques, gradient and LMS, recursive techniques, RLS and fast RLS) and IIR (gradient descent, SPR, AR-MAX) filtering. Adaptive algorithms for restoring signal properties. Implementation issues. Introduction to advanced fast transform algorithms (FFT, Winograd FFT, number theoretic transforms, DCT). Fast convolution and correlation. Basic concepts of abstract algebra and number theory will be studied, as well as computations in surrogate fields. Algorithms and architectures will be simulated by computer lab. Three hours of lecture, one hour discussion, three hours of lab. *Prerequisites:* ECE 162A, ECE 152A,B,C with grades of C- or better. (S) P. Chau

167. 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, buses, and communications protocols will be discussed. Three hours of lecture, four hours of lab. *Prerequisites:* ECE 160B, ECE 170A, 175B, (80 or CSE 70) with grades of C- or better. (F) C. Guest and P. Chau

169. 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 170A, ECE 80, or CSE 70 with grades of C- or better. (W) T.T. Lin and R. Fellman

171A. Linear Control System Theory (4)

Stability of continuous- and discrete-time single-input/single-output linear time-invariant control systems emphasizing frequency domain (s- and z-plane) methods. Transient and steady-state behavior. Stability analysis by root locus, Bode, and Nyquist plots. Design of compensators. Introduction to the state-variable formulation of the control problem for the linear time-invariant systems. Three hours of lecture, one hour discussion. *Prerequisites:* ECE 50A,B, ECE 105A with grades of C- or better. (W) A. Sebald

171B. Linear Control System Theory (4)

Time-domain, state-variable formulation of the control problem for both discrete-time and continuous-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 discussion. *Prerequisite:* ECE 171A with a grade of C- or better. (S) A. Sebald

172A. Introduction to Robotics: Kinematics and Dynamics (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 task-space control. Path/trajectory generation. Newton-Euler and Lagrangian formulations of manipulator dynamics. Three hours of lecture, one hour discussion. *Prerequisites:* grades of C- or better in ECE 171A-B and ECE 176A (may be taken concurrently). (F) K. Kreutz-Delgado

172B. Introduction to Robotics: Control of Redundant and Nonredundant Manipulators (4)

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, one hour discussion. *Prerequisites:* ECE 172A, ECE 176A with grades of C- or better. (W) K. Kreutz-Delgado

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. 2EA with a grade of C- or better. (Summer) A. Sebald

176A-B-C. Introduction to Optimization and Applications (4-4-4)

Unconstrained optimization. Constrained and discrete optimization. Linear and nonlinear programming. Kuhn-Tucker condi-

tions. Simplex method. Design of effective computational procedures for solving optimization problems. Optimal control problems; design of linear quadratic-optimal controllers, dynamic programming, maximum principle, calculus of variations, two-point boundary value problems. Three hours of lecture. *Prerequisites:* a grade of C- or better in Math. 2EA. ECE 176B requires a grade of C- or better in ECE 176A. ECE 176C requires a grade of C- or better in ECE 171A-B and ECE 176B. (F,W,S) D. Sworder

177. Microprocessor Real-Time Control Laboratory (4)
Project-based design course in which a microprocessor controls a dynamic electromechanical device in real time (including sensing, software, and actuation). Groups or pairs of students propose, design, build and debug project, which must function in real time by the last day of instruction. Involves fifteen hours per week in laboratory (twenty-four hour access for enrolled students). (Priority enrollment is given to robotics and control majors.) *Prerequisites:* a grade of C- or better in ECE 171A and concurrent enrollment in ECE 171B. (S) A. Sebald

190A. 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. *Prerequisites:* ECE 160A-B with grades of C- or better. (F) C. Guest

190B. 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. *Prerequisite:* ECE 190A with a grade of C- or better or sponsorship of a faculty member. (W) C. Guest

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. *Prerequisites:* ECE 131A-B-C 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, micro-

wave circuits, and antennas. Three hours of lecture. *Prerequisites:* ECE 121A,B,C 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)
The physical models for the bipolar junction transistor, the junction field-effect transistor, the metal-oxide-semiconductor (MOS) diode, and the MOS field-effect transistor are developed. Models for the behavior of these devices in circuits are also developed. Three hours of lecture. *Prerequisites:* 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. *Prerequisites:* 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. *Prerequisites:* 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. *Prerequisites:* 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. *Prerequisites:* 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 powder 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 hetero-junction 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 spectroscopies. 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

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 121A, B or equivalent; introductory quantum mechanics. (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. Opti-

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cal computing and other applications. Three hours of lecture. *Prerequisites: ECE 140B 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 140A, C 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. *Prerequisites: ECE 141A, B, or equivalent.* (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 coherence measurements. Design and fabrication of transmission, reflection, bleached, color, multiple exposure holograms. *Prerequisites: ECE 140A-B-C or consent of instructor. (This course is cojoint with ECE 141A. 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 140A-B-C or consent of instructor. (This course is cojoint with ECE 141B. Graduate students 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 waveguide properties. Characterization of Hughes LCLV spatial light modulator. *Prerequisites: ECE 140A-B-C or consent of instructor. (This course is cojoint with ECE 141C. Graduate students will choose 50 percent of the experiments and receive two units of credit.)* (S) S. Lee and S. Fainman

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 121A, B, C 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 hardware embodiments. Three hours of lecture. *Prerequisites: 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.* (F-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.* (W-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.* (S-alternate years) N. Bertram

250A. 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 152C or equivalent or consent of instructor.* (F) R. Lugannani

250B. Random Processes (4)
Convergence of sequences of distribution functions and characteristic functions, compact and weak convergence. Central limit

theorem, Liapunov and Lindeberg-Lévy theorem, infinitely divisible limit laws. Shot noise processes and generalized shot noise. Chernoff bound, Edgeworth series, saddle point expansions for probability distributions and densities. *Prerequisite: ECE 250A or consent of instructor.* (S) 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 non-recursive designs; fast Fourier transform, windowing, high-speed correlation and convolution; cepstrum analysis and homomorphic deconvolution. *Prerequisites: ECE 152A-B-C 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

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 152A-C, ECE 162A-B recommended; ECE 251B-C.* (F) S. Chatterjee

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.* (W) S. Chatterjee

253C. Digital Image Restoration and Reconstruction (4)
Theory and algorithms: deconvolution, additive and signal-dependent noise removal, band limited extrapolation, 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

254A-B-C. Detection Theory (4-4-4)
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 152C.* (F,W,S) E. Masry

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. *Prerequisites: ECE 250A.* (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 152A, B or equivalent, ECE 159A. 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) A. Viterbi

260A. VLSI Digital System Design: CAD Tools (4)

Custom and semicustom VLSI design from the system designer's perspective. VLSI system architectures, design methodologies, and computer-aided design (CAD) tools will be emphasized. Knowledge of basic semiconductor electronics and digital design is assumed. Three hours of lecture. *Prerequisites:* undergraduate-level semiconductor electronics and digital design; ECE 161B or equivalent or consent of instructor. (F) P. Chau

260B. VLSI Digital System Design: IC Chip Design Project (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 and R. Fellman

260C. VLSI Digital System Design: VLSI Testing (4)

Computer-aided procedures and hardware for testing IC chip design projects of ECE 230A-B-C sequence will be developed. Fabricated chips to be tested. Final reports and reviews of class projects to be presented and discussed in classroom presentations. Three hours of lecture. *Prerequisite:* ECE 260B. (S) P. 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 161A, 161B, 162A and 170A. (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 176A-B-C. (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 250A; 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 176A. 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 152A-B and ECE 271A (may be taken concurrently). (F) A. Sebald

276A-B. Advanced Robot Kinematics, Dynamics, and Control (4-4)

Parameterizations and group representations for rotations and general rigid-body Euclidean displacements. Infinitesimal generators and the Lie algebra of rotations and Euclidean displacements. Motion and force propagation operators and their algebra. Operator factorization and inversion of Jacobians and manipulator inertia tensors. Efficient forward- and inverse dynamics algorithms. Contact and grasp kinematics. Closed-chain kinematics and dynamics. Feedback linearizing control. Liapunov stability theory-based adaptive and nonadaptive control. Topics from (time permitting): control of nonholonomic systems; collision avoidance and computational geometry; neural network-based kinematic learning and control. *Prerequisites:* ECE 172A-B, ECE 176A-B-C, ECE 152C, prior or concurrent enrollment in AMES 271A-B-C. Highly recommended: ECE 273A-B and Physics 200A. (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

ENVIRONMENTAL STUDIES

the concepts learned in this course. *Prerequisites: experience equivalent to CSE 161A (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

291. Graduate Seminar in Applied Physics (2)

Weekly discussion of current research literature. 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: 3232 Literature Building, Warren College

Director

Margaret Loken, M.A.

The English as a Second Language Program offers two writing courses and one reading course for any interested nonnative speakers, one writing course for nonnative-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. ESL Critical Reading may be taken once.

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.*

12. Critical Reading (4)

This course is designed to offer ESL students directed practice in the critical reading skills required of them. Students will be guided to approach university-level readings analytically and to formulate critical responses to the texts. Winter and spring only. *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: Muir College Interdisciplinary Studies Office, 2024 Humanities and Social Science Building

Faculty

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*

William Deverell, Ph.D., *Assistant Professor, History*

Patrick Ledden, Ph.D., *Provost, Muir College*
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 world-wide complex of preindustrial, industrial, and postindustrial societies. The minor is structured as follows:

Required: Contemporary Issues 30A, 30B

Required: Four additional courses, at least three in the upper division, from the following two lists. At least one course must be taken from Group A and at least one from Group B.

Group A	Group B
Biology 3	USP 2
Earth Sciences 40	ANBI 132*
AMES 119B	Economics 131
Biology 162	Economics 132
Biology 169	HIUS 154
Biology 170	Philosophy 186
Biology 173	Sociology/D 184
Biology 176*	Sociology/D 185
Chemistry 149A	USP 105
Chemistry 173	USP 175

*These courses are cross-listed.

Some of the above courses, particularly in Group A, have significant prerequisites, and students planning an environmental studies minor should read the catalog descriptions carefully. Courses will be added to the lists as departments and programs develop additional offerings. Petitions for transfer courses, Education Abroad Program courses, and individual additions to the above lists must be approved by the chair of the Environmental Studies Steering Committee. Additional information may be obtained from the Muir Interdisciplinary Studies office.

ETHNIC STUDIES

OFFICE: Literature Building, Rm. 3410, Warren College

Faculty

Paule Cruz Takash, Ph.D., *Assistant Professor*
 Yen Le Espiritu, Ph.D., *Assistant Professor*
 Ross Frank, Ph.D., *Assistant Professor*
 Ramon A. Gutierrez, Ph.D., *Professor and Chair*

George Lipsitz, Ph.D., *Professor*
 Leland Saito, Ph.D., *Assistant Professor*

Associated Faculty

James Cheatham, *Music*
 Matthew Chen, *Linguistics*
 Wayne Cornelius, *Political Science*
 Steve Cornell, *Sociology*
 Anthony Curiel, *Theatre*
 Steve Erie, *Political Science*
 Claudio Fenner-Lopez, *Communication/Visual Arts*
 Frances Foster, *Literature*
 Floyd Gaffney, *Theatre*
 Harry Hirsch, *Political Science*
 Jorge Huerta, *Theatre*
 Arend Lijphardt, *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*
 Julie Saville, *History*
 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:

- ES 102: Racial Inequality in America
- ES 103: American Culture and Ethnic Identity
- ES 104: The Idea of Race in America
- ES 105: Ethnic Diversity and the City
- ES 106: Ethnoracial Transformations of U.S. Communities

- ES 112: History of Native Americans in the United States
- ES 115: The Sociology of Indian-White Relations
- ES 119: Multiracial Societies in the Americas
- ES 120: Comparative Asian-American History, 1850-1965
- ES 121: Contemporary Asian-American History
- ES 123: Asian-American Politics
- ES 130: Social and Economic History of the Southwest I
- ES 131: Social and Economic History of the Southwest II
- ES 150: Politics of Cultural Pluralism and National Integration
- ES 151: Ethnic Politics in America
- ES 152: Law and Civil Rights
- ES 155: The Supreme Court and the Constitution
- ES 156: Civil Liberties—The Rights of Criminals and Minorities
- ES 157: Ethnic Conflict in the Third World
- ES 158: Immigration Policy and Politics
- ES 169: African Society and the Slave Trade
- ES 170: Slavery and the Atlantic World
- ES 171: Slavery and Freedom in the Nineteenth-Century United States
- ES 197: Field Work in Racial and Ethnic Communities*
- ES 198: Directed Group Studies*
- ES 199: Supervised Independent Study and Research*

*Only two will be counted in fulfillment of this requirement.

Colloquia

- ES 180: Topics in Mexican-American History
- ES 181: American Slave Communities in Comparative Perspective
- ES 182: Segregation, Freedom Movements, and the Crisis of the Twentieth Century
- ES 183: Gender, Race, Ethnicity, and Class
- ES 189: Special Topics in Ethnic Studies

C. At least three upper-division courses that focus on language and ethnicity:

- ES 140: Language and American Ethnicity
- ES 141: Language and Culture
- ES 142: Languages of Africa
- ES 145: Spanish Language in the United States

Due to the limited course offerings in this general area during the 1993-94 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:

- ES 101: Ethnic Images in Film
- ES 110: Cultural World Views of Native Americans
- ES 111: Native American Literature
- ES 122: Asian-American Culture and Identity
- ES 132: Chicano Dramatic Literature
- ES 133: Hispanic-American Dramatic Literature
- ES 134: The Chicana
- ES 135: Development of Chicano Literature
- ES 136: Themes and Motifs in Chicano Literature
- ES 137: Chicano Prose
- ES 138: Chicano Poetry
- ES 139: Chicano Literature in English
- ES 144: Colonialism and Culture
- ES 146A-B: Theatrical Ensemble
- ES 172: Afro-American Prose
- ES 173: Afro-American Poetry
- ES 174: Themes in Afro-American Literature
- ES 175: Literature of the Harlem Renaissance
- ES 176: Black Music/Black Texts: Communication and Cultural Expression
- ES 177: Modern Black Drama
- ES 178: Introduction to Oral Music
- ES 179A-B: Music of Black 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 wishing to minor in ethnic studies must take six four-unit upper-division courses from the department's offerings. All students minoring in ethnic studies must enroll in Theories and Methods of Ethnic Studies (ETHN 100) and Research Methods: Studying Ethnic and Racial Communities (ETHN 190). At least two, but not more than three, of the four remaining courses must 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.

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

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 not being incorporated into American institutions; and implications of these transformations for the nation.

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 181.)

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.

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 survey exploring the interconnectedness of language and culture. Special areas to be emphasized include child language learning and socialization, alternative sources of knowledge, and culturally specific styles of interaction.

142. Languages of Africa (4)

Introduction to the study of African languages from various linguistic perspectives. Topics may include techniques of linguistic analysis applied to systems of sounds, word formation, sentence structure, and genetic relationships; language and society; language planning. (Cross-listed with LIGN 108.)

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-B. 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 120-121.)

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 Poli. 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 Poli. 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 Poli. 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 Poli. Sci. 150A.)

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. Modern Black Drama (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 Black Americans (4-4)

The first quarter of this course will investigate the vocal music of black 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.

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.)

500. Apprentice Teaching in Ethnic Studies

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.



OFFICE: Provost, Fifth College, Building 412, University Center

THE MAKING OF THE MODERN WORLD/Writing PROGRAM

OFFICE: Fifth College Writing Program, Building 412, University Center

See "The Making of the Modern World" program for Fifth Writing.

FIFTH COLLEGE HONORS PROGRAM

OFFICE: Provost, Fifth College, Building 412, University Center

The Fifth College Honors Program provides outstanding students with special courses, cultural activities, and other opportunities for academic enrichment and recognition. Particularly well-prepared entering students will be invited to participate in the Freshman Honors Program. During their first year at Fifth College, these students will enroll in special seminars in which internationally oriented faculty members from a variety of disciplines will discuss their research. This small group setting is designed to give selected students an opportunity for direct, informal interactions with faculty. Second-year students with cumulative GPAs of 3.5 or higher have the opportunity to pursue independent study with a faculty member by enrolling in Fifth 92. Students generally select themes or topics from material encountered in MMW.

10. Fifth Freshman Honors Seminar (0)

Biweekly, two-hour seminar conducted by five different members of Fifth College faculty, who will introduce students to their own research projects having a cross-cultural or international focus. Fifth College. *Prerequisite: by invitation only.* Pass/Not Pass grades only. (F)

20. Freshman Honors Seminar: International Themes (1)

Each quarter a faculty member engaged in research with an international component will lead a seminar devoted to some aspect of his or her research. *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 related to the MMW sequence done under direction of a faculty member. Open only by special permission of Fifth College to students who received Provost's Honors in first year at UCSD. Repeatable for credit twice up to a total of six units over three quarters. Pass/Not Pass only.

100. Writing about Cross-Cultural Transitions (2)

In this writing-intensive course students will read theories of cultural relativism and cross-cultural interaction; analyze how writers and scholars represent cultural "otherness"; and submit three five-page papers for peer critique and instructor evaluation.

tion. They will revise one of the three papers for their final project. *Prerequisite: participation in a program abroad.*

196. Honors Project (4)

Senior thesis research project for students who have been accepted into the Fifth 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 Fifth Individual Studies major.*

199. Fifth 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 Fifth College Individual Studies major. *Prerequisite: admission to Fifth Individual Studies major.*

FIFTH SEMINAR

OFFICE: Provost, Fifth 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)*

FRONTIERS OF SCIENCE

OFFICE: 1512 Galbraith Hall, Revelle College

These courses in the frontiers of knowledge are concerned with three kinds of frontiers:

1. Recent discoveries or breakthroughs in scientific research and in technology.
2. The frontiers between different sciences where the areas of human understanding depend on the interactions between two or more sciences or technologies, such as the many problems related to energy.
3. The frontiers between science and other human affairs, including the practical social problems where science and technology can contribute to a solution.

The Frontiers of Science courses are specifically designed to be used as a noncontiguous minor or as noncontiguous electives by non-science majors in Revelle College. They may also be used as electives and/or to fulfill requirements in other colleges (see relevant provost's office for details). With the approval of the appropriate faculty adviser, certain courses may also be used in partial fulfillment of requirements for a science minor.

All Frontiers of Science courses presuppose some familiarity with college-level science and mathematics. For that reason, these courses require junior or senior

standing and either the equivalent or completion of the Revelle general-education requirements in natural science (biology, chemistry, calculus, and physics) or the consent of the instructor.

Freshmen and sophomores (or others) who wish to take science courses for which there are no prerequisites should also see Earth Sciences 10, 12, 20, and 30, Physics 5, and lower-division courses organized for the non-major by the Department of Biology. A maximum of two such lower-division courses can be used in partial fulfillment of an *approved* Frontiers of Science minor. However, Revelle students who elect to take noncontiguous science electives in lieu of an approved minor may use three noncontiguous lower-division science courses.

Courses

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)*

GREEK LITERATURE

See Literature.

HEALTH CARE—SOCIAL ISSUES

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, 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, and 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 post-graduate 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. Students who complete the health care—social issues course work but do not use it as a minor (or program of concentration) may elect to have a special transcript notation certifying completion of the program. Transcript notation requests must be obtained from and approved by the Interdisciplinary Programs Office. 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 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, the 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, Warren College.

HEALTH CARE—SOCIAL ISSUES MINOR REQUIREMENTS

The minor consists of six courses (two required and four electives, chosen from a list of approved courses). At least four courses (Philosophy 122, which is required, and three electives) must be taken at the upper-division level. Upper-

HISTORY

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 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

4. Sociology/L 40—Sociology of Health Care Issues
5. Philosophy 122—Bio-Medical Ethics

ELECTIVE COURSE OPTIONS

Four courses to be chosen from the following list. At least three 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

Contemporary Issues

- 22—Human Sexuality
- 40—The AIDS Epidemic
- 136—Anthropology of Medicine
- 181—Seminar in Medical Anthropology

Economics

- 1A, 1B—Elements of Economics
- 138—Economics of Health

Philosophy

- 124—Contemporary Moral Issues
- 127—Professional Ethics
- 185—Special Topics (prior approval of topic required)

Psychology

- 1—Psychology

- 2—General Psychology: Biological Foundations
- 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
- 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

- 137—Alcohol and Society
- 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 5024, Humanities and Social Sciences Bldg., Muir College

Professors

Stanley Chodorow, Ph.D., *Dean of Arts and Humanities*
Joseph W. Esherick, Ph.D., *Hsiu Professor of Chinese Studies*
David Noel Freedman, Ph.D., *Endowed Chair, Biblical Studies*
David M. Goodblatt, Ph.D.
Ramón A. Gutierrez, Ph.D.
Steven Hahn, Ph.D.
Judith M. Hughes, Ph.D.
David S. Luft, Ph.D.
Allan Mitchell, 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*
Robert S. Edelman, Ph.D.
Robert Marc Friedman, Ph.D.
Rachel Klein, Ph.D.
John A. Marino, Ph.D.
Michael P. Monteón, Ph.D.
William H. Propp, Ph.D.
Julie Saville, Ph.D.
Cynthia M. Truant, Ph.D., *Vice-Chair*

Assistant Professors

William F. Deverell, Ph.D.
Takashi Fujitani, Ph.D.
David G. Gutierrez, Ph.D.
Christine Hunefeldt, Ph.D.
Hasan Kayali, Ph.D.
Dorothy Y. Ko, Ph.D.
Stephanie McCurry, Ph.D.
Michael Meranze, Ph.D.
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., *Associate Professor, Political Science*
 Paul Drake, Ph.D., *Professor, Political Science*
 Steve Erie, Ph.D., *Associate Professor, Political Science*
 Peter Smith, Ph.D., *Professor, Political Science*
 Leften Stavrianos, Ph.D., *Professor Emeritus, Clark University*

Emeriti Professors

Guillermo Cespedes, Ph.D.
 John S. Galbraith, Ph.D.
 H. Stuart Hughes, Ph.D.
 Gabriel Jackson, Ph.D.
 Thomas A. Metzger, Ph.D.
 Earl Pomeroy, Ph.D.
 Ramón Eduardo Ruiz, Ph.D.

THE UNDERGRADUATE MAJOR

"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 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 departmental coordinator of student advising and registration (CSAR). After determining the student's likely field of emphasis, the CSAR will then assign him or her to an appropriate faculty adviser. In consultation with this academic adviser, the student should select a coherent program of history courses that will lead to completion of the major. All undergraduate majors are required to consult with the academic adviser at least once each quarter, during a designated advising period, and to obtain written approval for the selection of courses for the quarter following. Any difficulties in the advising procedure or in registration formalities should be reported to the CSAR.

The fields are as follows: Africa (HIAF), East Asia (HIEA), Europe (HIEU), History of Science (HISC), Latin America (HILA), Near East (HINE), and U.S. History (HIUS).

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.

Three of the twelve upper-division courses must be chronologically situated before 1800. These courses 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.

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 CSAR.)

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 requirements. 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.

THE HONORS PROGRAM

The department offers a special program for outstanding students. 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 record and the recommendation of professors familiar with the student's work. Interested candidates should complete the application form (available in the Department of History office) prior to May 15.

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 inde-

pendent 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 AT HOME PROGRAM (EHP)

In the winter quarter 1993, the UCR campus will continue the Education at Home Program (EHP) for those students with special interest in early American history and culture. Those selected for participation in this program will spend nine weeks in Williamsburg, one in Philadelphia, and a concluding week in Washington, D.C. *This program is open to all undergraduates from any campus in the UC system. With the prior approval of their graduate adviser, graduate students may also apply.* Registration (through the Riverside campus) will be made for the following three courses in the Department of History: 157, 158, and 159. Special arrangements for additional independent study (maximum of four units) may be made with the student's home campus. For further information, brochures, or application forms, call Susan Braddock at (714)

787-3820. Preference is given to applications received by June 30; final application deadline is November 1.

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, seminars, or independent study courses. Master's students may enroll in a research seminar offered for Ph.D. students with the permission of the instructor. 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 (and the degree will be an M.A. in Chinese history), it is an interdisciplinary program, permitting the student to select 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, in business, journalism, education and 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 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. 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.

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.

Note: The department hopes to be able to add Greek and Roman history as a major field within the near future.

- 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 a 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. First and Second Minor Fields

The first and second minor will ordinarily be the premodern history of the East Asian country chosen for the major field, and the modern history of the country *not* chosen for the major field. That is, stu-

dents specializing in modern China will do minor fields in premodern China and modern Japan; students specializing in modern Japan do minors in premodern Japan and modern China. Specifying these two minors is designed to train Ph.D.s for the type of jobs that are available. It is typical for East Asian history professors to be asked to teach survey courses covering modern East Asian (including both China and Japan), or national history courses covering the entire period of Chinese or Japanese history.

- C. Third Minor Field

The function of the third minor is to broaden the student's perspective on East Asian history through one of two types of supplementary work:

 1. A history field outside of East Asia.
 2. A related discipline, offered through another department, which will be studied with particular attention to East Asia.
- 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 inter-departmental 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 areas 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.
2. An area of discipline, offered through another department, related to the student's dissertation or preparation for university teaching.

D. Language Requirement

Competency in one language 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 minor fields in this area.

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.) 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 agreed-upon 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. Major Field

Ordinarily, Ph.D. students take the major oral examination no later than the spring of their third year of study (except as otherwise specified by the individual fields). Students must fulfill all course work, minor fields, and language requirements before taking the oral examination. Students should consult with their adviser

about the composition of the examining committee well before the examination. The examination committee will normally act as the dissertation committee. It is strongly encouraged that students also submit a prospectus, in addition to the major field book list, 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 the 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.

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.

PH.D. AND M.A. LANGUAGE REQUIREMENTS

Ph.D. candidates in ancient, East Asian, and European history must demonstrate competency in two foreign languages. Ph.D. candidates in history of science, Latin American and United States history, and M.A. candidates in European and Latin American history must demonstrate competency in one foreign language. 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 the student's major field adviser.

Students may satisfy the foreign language requirement in one of the following ways:

- A. By achieving, for Ph.D. candidates, a score of 600 or better in one language and 550 or better in a second language, if required; and for M.A. candidates, a score of 550 or better on the Graduate School Foreign Language Test (GSFLT) administered by the Educational Testing Service.
- B. By passing a proficiency examination administered by the Department of Linguistics, with a score of 30 or better.
- C. By completing, with a grade of B — or better in each term, a two-year, lower-division sequence in the language approved by the Graduate Committee.
- D. 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.

E. For languages not covered by the GSFLT or 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 member proficient in the language.

NOTE: with reference to options C and D, 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.

COURSE WORK

A normal full-time program consists of twelve units per quarter. Ph.D. students are expected to complete the following minimum of formal courses prior to their examinations: two two-quarter research seminars and eight colloquia, conjoined or directed reading courses, or three two-quarter research seminars (not necessarily in the same field) and six colloquia, conjoined or directed reading courses. Under certain circumstances, when appropriate colloquia are not available, students may substitute upper-division undergraduate courses for colloquia in the minor fields, with extra study required. Students are encouraged to take at least one colloquium or research seminar in their major field during the initial year of graduate study.

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

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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.

OPPORTUNITIES FOR TEACHING

Undergraduate teaching, for which students 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 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.

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 on 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.

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 norma-

tive 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. Saville

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. Gutierrez

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

AFRICA

Lecture Courses

HIAF 110. History of Africa to 1880 (4)

(Cross-listed as Third World Studies 175A.) A survey of pre-colonial Africa, concentrating on ancient Africa, Islam, state formation, the slave trade and abolition, and European penetration of the interior. Reynolds. + (Formerly Hist. 175A.)

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. Reynolds (Formerly Hist. 175B.)

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. Reynolds (Formerly Hist. 176.)

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. Reynolds (Formerly Hist. 177.)

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. Reynolds + (Formerly Hist. 178.)

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)

Will examine selected topics in African economic history. Topics will include the precolonial economy, economics of colonialism, economics of underdevelopment, and postcolonial economic development. Special topics will vary from year to year. Department stamp required. *Prerequisites: completion of several upper-division history courses.* Reynolds (Formerly Hist. 177Q.)

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 (Formerly Hist. 178Q.)

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, land-holding, 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, Taishō 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 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 by 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 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 (Formerly Hist. 182.)

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 (Formerly Hist. 183.)

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 post-revolutionary institutionalization, the role of ideology, the tension between city and countryside, Maoism, the Great Leap Forward, the Cultural Revolution. Pickowicz (Formerly Hist. 184.)

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. (Formerly Hist. 180Q.)

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 (Formerly Hist. 183Q.)

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 (Formerly Hist. 185Q.)

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. Escherick

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 (Formerly Hist. 189Q.)

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 + (Formerly Hist. 101A.)

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 + (Formerly Hist. 101B.)

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 + (Formerly Hist. 102A.)

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 Constantine. Mosshammer + (Formerly Hist. 102B.)

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). Mosshammer +

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. Chodorow + (Formerly Hist. 103A.)

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. Chodorow + (Formerly Hist. 103B.)

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. Chodorow + (Formerly Hist. 104A.)

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. Chodorow + (Formerly Hist. 104B.)

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

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actions in property law. Third, we will discuss the origins of modern contract law. Chodorow + (Formerly Hist. 129.)

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 + (Formerly Hist. 105A.)

HIEU 121. Late Italian Renaissance: From Machiavelli 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 + (Formerly Hist. 105B.)

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 + (Formerly Hist. 105C.)

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 + (Formerly Hist. 105D.)

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 + (Formerly Hist. 106A.)

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 + (Formerly Hist. 130A.)

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 + (Formerly Hist. 130B.)

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 + (Formerly Hist. 107.)

HIEU 131. The French Revolution: 1789–1814 (4)

A lecture and discussion course dealing with the Revolution in France and its impact throughout Europe. Among the topics considered will be the origins of the Revolution, the birth of popular radicalism, the nature of the Terror and Robespierre and the impact of the Napoleonic Wars on England, Germany, and Italy. *Prerequisite: upper-division standing.* Truant + (Formerly Hist. 108.)

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 + (Formerly Hist. 118.)

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 (Formerly Hist. 116.)

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 + (Formerly Hist. 110A.)

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 + (Formerly Hist. 112A.)

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 137. British Empire Since 1840 (4)

The political and economic development of the British empire, including the evolution of colonial nationalism, the development of the commonwealth idea, and changes in British colonial policy. *Prerequisite: upper-division standing or consent of instructor.* Galbraith (Formerly Hist. 131A-B.)

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 + (Formerly Hist. 135A.)

HIEU 139. History of Canada (4)

A survey of the growth of Canada into a modern state from its beginnings under the French and British colonial empires. Galbraith

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 re-

definition 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 (Formerly Hist. 112B.)

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 (Formerly History 113)

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 (Formerly Hist. 114.)

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 (Formerly Hist. 119.)

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 (Formerly Hist. 124.)

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 Industrial Revolution (4)

The course deals with changes in women's roles, status, and sexual taboos from the beginning of the Middle Ages to 1789. HIEU 147 is not a prerequisite to HIEU 148. *Prerequisite: upper-division standing.* Truant + (Formerly Hist. 128A.)

HIEU 148. The History of Women in Europe: Industrial Revolution to the Present (4)

This course covers the history of women from the Industrial Revolution to the present, focusing on the role of women in radical political movements, the evolution of women's work and feminism. HIEU 147 is not a prerequisite to HIEU 148. *Prerequisite: upper-division standing or consent of instructor.* Truant (Formerly Hist. 128B.)

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 (Formerly Hist. 122.)

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 (Formerly Hist. 135B.)

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, and communism 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 (Formerly Hist. 125.)

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 (Formerly Hist. 121.)

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 (Formerly Hist. 126.)

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 (Formerly Hist. 110B.)

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 (Formerly Hist. 171.)

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 + (Formerly Hist. 1320.)

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 + (Formerly Hist. 104Q.)

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 + (Formerly Hist. 105Q.)

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 + (Formerly Hist. 134Q.)

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 + (Formerly Hist. 115Q.)

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 + (Formerly Hist. 116Q.)

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 + (Formerly Hist. 112Q.)

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 (Formerly Hist. 120Q.)

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 (Formerly Hist. 121Q.)

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 (Formerly Hist. 113Q.)

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 (Formerly Hist. 122Q.)

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 (Formerly Hist. 130Q.)

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 (Formerly Hist. 118Q.)

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 (Formerly Hist. 119Q.)

HIEU 178/278. Special Topics in Modern Russian History (4)

Topics will vary from year to year. May be repeated for credit. Edelman (Formerly Hist. 110Q.)

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

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. The Discovery of Prehuman Time and History (4)

The emerging knowledge of the vast scale of the past history of the natural world and the consequent dwarfing of human history, from the chronologies of the seventeenth century to the planetary histories and radiometric dating of the twentieth. *Prerequisite: upper-division standing.* Rudwick (Formerly Hist. 194.)

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 + (Formerly Hist. 168.)

HISC 103. Gender and Science in Historical 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 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

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. Rudwick (Formerly Hist. 131Q.)

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. Rudwick/Westman (Formerly Hist. 182Q.)

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 (Formerly Hist. 192Q.)

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.

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.* Rudwick

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.* Monteon (Formerly Hist. 140C.)

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. Hunefeldt

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.* Monteon (Formerly Hist. 148A.)

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. Monteon (Formerly Hist. 148B.)

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 (Formerly Hist. 143C)

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 ef-

orts and on Mexico, Cuba, Brazil, and Argentina. Lecture, discussion, reading, and films. *Prerequisite: upper-division standing or consent of instructor.* Van Young (Formerly Hist. 149.)

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 + (Formerly Hist. 141.)

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.* Monteon

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. Hunefeldt

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.* Monteon (Formerly Hist. 143A.)

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.* Monteon (Formerly Hist. 143B.)

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.* (Formerly Hist. 147.)

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.* (Formerly Hist. 146A.)

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.* (Formerly Hist. 146B.)

Colloquia

The following courses are available to both undergraduate and graduate students. Under-

graduates 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. Gutierrez (Formerly Hist. 143G.)

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. Hunefeldt

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. Monteon (Formerly Hist. 144Q.)

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 (Formerly Hist. 147Q.)

HILA 170/270. Topics in Latin American History, 1820-1910 (4)

Topic will vary from year to year. May be repeated for credit. Staff (Formerly Hist. 146Q.)

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. Gutierrez (Formerly Hist. 145Q.)

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 + (Formerly Hist. 100.)

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 archaeological data. Prerequisite: upper-division standing or consent of instructor. D.N. Freedman + (Formerly Hist. 109.)

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 + (Formerly Hist. 137.)

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 Achaemenid 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. Prerequisite: upper-division standing. 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 + (Formerly Hist. 136.)

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 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 + (Formerly Hist. 160.)

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 + (Formerly Hist. 161.)

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 + (Formerly Hist. 166.)

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 re-

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lations between planters and yeomen, the development of slave communities, and the growing sectional conflict. *Prerequisite: upper-division standing or consent of instructor.* Hahn (Formerly Hist. 153.)

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 (Formerly Hist. 172.)

HIUS 114. California History (4)

This course examines California history from 1800 onward, with an emphasis on social, economic, and political change. The course will explore the effect of national and international events as well as the ways in which California—the ideal and the real—shapes the American experience. Deverell

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. Deverell

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 (Formerly Hist. 167A.)

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 (Formerly Hist. 167B.)

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 (Formerly Hist. 169A)

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-Soviet relations after 1945, the cold war, Vietnam, and contemporary developments. Staff (Formerly Hist. 169B)

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 (Formerly Hist. 123)

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, anti-slavery and proslavery thought. *Prerequisite: upper-division standing or consent of instructor.* Klein (Formerly Hist. 151A.)

HIUS 131. Cultural History from the Civil War to the Present (4)

This course will focus on the transformation of work and leisure and the development of consumer culture. Students will consider connections between culture, class relations, gender ideology, and politics. Topics will include labor radicalism, Taylorism, the development of organized sports, the rise of department stores, the transformation of middle-class sexual morality, the growth of commercial entertainment, and the culture of the cold war. *Prerequisite: upper-division standing or consent of instructor.* Klein (Formerly Hist. 151B.)

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. Saville (Formerly Hist. 159A.)

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. Saville (Formerly Hist. 159B.)

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 work culture, political consciousness, labor organization, and working-class protest. *Prerequisite: upper-division standing.* Staff (Formerly Hist. 164.)

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 dealt with historically. Deverell

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 move-

ments; and the transformation of American popular culture. D. Gutierrez

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 (Formerly Hist. 154A.)

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 (Formerly Hist. 154B.)

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 (Formerly Hist. 157.)

HIUS 153. American Political Trials (4)

Survey of politicized criminal trials and impeachments from Colonial times to the 1880s. Examines politically-motivated 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. Deverell

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. Gutierrez, R. (Formerly Hist. 155A)

HIUS 159. Social and Economic History of the Southwest II (4)

(Cross-listed as Ethnic Studies 131.) 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. Gutierrez, R. (Formerly Hist. 155B)

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. (Formerly Hist. 154Q.)

HIUS 161/261. Popular Politics and 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 (Formerly HIGR 263)

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 behavior, 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.* Saville

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. Saville

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 (Formerly Hist. 153Q.)

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. Gutierrez, R. (Formerly Hist. 155Q)

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 (Formerly HIGR 255)

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 (Formerly Hist. 163Q.)

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 (Formerly Hist. 166Q.)

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 (Formerly Hist. 168Q.)

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 (Formerly Hist. 162Q.)

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. Saville

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.* Gutierrez

HIUS 181/281. Topics in 20th 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 + (Formerly Hist. 179A.)

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 + (Formerly Hist. 179B.)

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 + (Formerly Hist. 179C.)

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

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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

The following courses are available to both undergraduate and graduate students. Undergraduates must receive a departmental stamp or permission of the instructor to register for the course. Requirements for each course will differ for undergraduate, M.A., and Ph.D. students.

HITO 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 Hobsbawm, Perry Anderson, Robert Brenner, Eugene Genovese, and Andre Gunder Frank. Hahn (Formerly Hist. 152Q.)

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 (among them ethnology, anthropology, and psychology) have treated gender differences. *Prerequisite: department stamp or consent of instructor.* J. M. Hughes.

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. *Prerequisites: consent of instructor. Department stamp required.* Staff (Formerly Hist. 196A.)

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 (Formerly Hist. 196B.)

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 (Formerly Hist. 196Q.)

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 (Formerly Hist. 197.)

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 (Formerly Hist. 198.)

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 (Formerly Hist. 199.)

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 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 1993-94.)

HIGR 211A-B-C. Literature of Modern East Asian History (4-4-4)

This three-quarter sequence will introduce students to the monographic literature and the main historiographic controversies of modern East Asian history. Ordinarily, one quarter will focus on China, and one quarter on Japan, and one on comparative topics in Chinese and Japanese history. *Prerequisite: Graduate standing or permission of instructor.* Esherick

HIGR 212. 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 214A-B. Modern East Asian History (4-4)

A two-quarter research seminar in East Asian History. A paper, based on original research, due in the second quarter. Seminar topics will vary, with focus shifting from China to Japan in alternate years. Reading knowledge of Chinese or Japanese 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. Esherick

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. Chodorow

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.* Chodorow

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 (Not offered in 1993-94.)

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 1993-94.)

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 1993-94.)

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.

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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.* (Not offered in 1993-94.)

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 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 247A covers the colonial period, from conquest to independence to today; HIGR 247B covers South America from independence to today; HIGR 247C 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: 240A is a prerequisite for 240B.*

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. Ruiz

HIGR 252. History, Social Evolution, and Intellectuals in the Andes: Mariátegui, Haya de la Torre, and Arguedas (4)

The course will study three major twentieth-century interpreters of Andean history and society. Mariátegui is Latin America's most original socialist intellectual; Haya de la Torre is the founder of Peru's most important party; and Arguedas was the most profound interpreter of the role of Indian peasants in the Andean nations. *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

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.

tual 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/Saville

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: 270A is a prerequisite for 270B.*

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.

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 1993-94.)

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 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.

INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL (IR/PS)

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.)

dents 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.*

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.
Peter Gourevitch, Ph.D., *Dean*
Stephen Haggard, Ph.D.
Chalmers Johnson, Ph.D., *Emeritus*

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 stu-

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. Students for whom Humanities 1-5 fulfill general-education requirements may not also use these courses for 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

Miles Kahler, Ph.D.
 Alex Kane, Ph.D.
 Lawrence Krause, Ph.D.
 Bruce Lehmann, Ph.D.
 Gordon MacDonald, Ph.D.
 R. John McMillan, Ph.D.
 Susan Shirk, Ph.D.

Associate Professors

Barry Naughton, Ph.D., *Associate Dean*
 Yasu-Hiko Tohsaku, Ph.D.

Assistant Professors

Roger Bohn, Ph.D.
 Takeo Hoshi, Ph.D.
 Taekwon Kim, Ph.D.
 Luis Rivera-Batiz, Ph.D.
 Matthew Shugart, Ph.D.

Adjunct

Harold Agnew, Ph.D.
 Paul W. Drake, Ph.D.
 Theodore Groves, Ph.D.
 Joseph Grunwald, Ph.D.
 J. Luis Guasch, Ph.D.
 Germaine Hoston, Ph.D.
 David Lake, Ph.D.
 David Mares, Ph.D.
 Lisa Martin, Ph.D.
 Michael May, Ph.D.
 James Rauch, Ph.D.
 Peter H. Smith, 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 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 experiences, 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 #1901 for UCSD, Pacific International Affairs.) 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 contact the IR/PS office at (619) 534-5914 well in advance of the January 15 application deadline to schedule appointments.

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. Given the intensive, integrated nature of the MPIA curriculum, part-time study is not feasible. The minimum required course-load is twelve units per quarter.

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. Core courses list as follows:

- Economics (Managerial and International Economics)
- 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 examination 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)
- *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 three 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 courses examining the political-military relations among states as well as political dimensions of interstate relations. Attention is directed toward the Pacific region as an international subsystem.

Comparative Public Policy: This concentration includes courses comparing public 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.

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.

At the present time, students can fulfill the foreign language requirement in Mandarin Chinese, Japanese, Korean, or Spanish. Students may also fulfill their language proficiency requirement in other languages, such as Brazilian, Portuguese, Vietnamese, 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 two-plus on the Foreign Service Institute Scales (FSI)—and two-minus for Mandarin Chinese, Japanese, and Korean. 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 lan-

guage courses for professional proficiency in the three 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, 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 requirement; 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 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 résumé 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, consulting, or research organizations. The number of students admitted to the program each year is small and, within the general requirements described below, 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 geographical areas or fields of emphasis covered in the program. The GRE (verbal, quantitative, and analytical) is required of all applicants. (Indicate code HR 4836 for UC San Diego, 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.)

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. The program also exposes students to both public and private perspectives on these 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 a secondary field complementing the student's major field of emphasis. Knowledge of the major and minor fields is evaluated by comprehensive examinations; knowledge of the Pacific region is demonstrated through course work in three courses dealing with a country or subregion in the Pacific.

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 MAJOR FIELD AND MINOR FIELDS

- International Relations
- International Economic Policy and Management
- Comparative Policy Analysis

At the time of application into the Ph.D. in international affairs program, students must declare a major in 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 a four-course minor in a field different from the one in which they are majoring. 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 work in the major and minor fields may be in both IR/PS and, with

adviser's permission, in related departments. Students must make satisfactory progress in a coherent program of course work and reading courses in the major and minor fields which meets the approval of their Program Advisory Committee.

PACIFIC REGION ISSUES

Students must take at least three courses on policy processes and issues in the Pacific region. These courses must focus on the Pacific region as a whole, a subregion, or 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. Qualifying examinations on regional areas are not required.

SKILL REQUIREMENTS

Students must satisfy the following skill requirements:

1. Basic Requirements: All Ph.D. students must have at least a rudimentary knowledge of statistics *and* a foreign language. The course requirements are:

Quantitative Methods: the equivalent of one course in statistics, *and*

Foreign Language: the equivalent of two years of college-level foreign language.

2. Advanced Requirements: To prepare for carrying out independent research, students must have *either* advanced competence in quantitative methods *or* a foreign language. The choice will depend on each student's research interests and professional goals. Some students may devote the extra time and effort required to achieve advanced competency in both quantitative methods and foreign language. The requirements are:

Quantitative Methods: the ability to use advanced methods of statistical data analysis and mathematical modeling in research, certified by courses or examination, *or*

Foreign Language: a research working knowledge, certified by a written and oral examination.

GRADUATE POLICY SEMINAR

All third-year doctoral students must participate in the Graduate Policy Seminar. This seminar brings together advanced Ph.D. students and faculty to discuss policy issues in the Pacific region. The course requires students to make presentations of literature reviews, research papers, and a dissertation prospectus.

COMPREHENSIVE EXAMINATIONS

Students will normally prepare for comprehensive examinations by taking course work offered by the school and related disciplinary departments. At least one-third of all courses must be taken at IR/PS. (Remaining courses must be taken at the graduate level.) Students who have completed master's programs elsewhere may discuss with their Program Advisory Committee ways of incorporating their previous course work into the Ph.D. program at IR/PS.

QUALIFYING EXAMINATIONS

Students must pass written comprehensive examinations in their major and minor fields. These exams will be administered by a committee of IR/PS faculty.

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. CURRICULUM REQUIREMENTS FOR A MAJOR IN INTERNATIONAL RELATIONS

All students with a major in international relations must complete a core requirement, including courses in international relations theory, international relations of the Pacific region, strategic analysis, quantitative methods, and a graduate policy seminar (three-quarter sequence). Other requirements include two additional regional courses, a four-course minor, and seven elective courses—five in international relations and two in any field.

PH.D. CURRICULUM REQUIREMENTS FOR A MAJOR IN INTERNATIONAL ECONOMIC POLICY AND MANAGEMENT

All students majoring in international economic policy and management must complete the core requirement which includes five three-

quarter sequence courses in microeconomics, macroeconomics, econometrics, and both a research and graduate policy seminar. Other course requirements include two electives, a three-course regional requisite, and a four-course minor.

PH.D. CURRICULUM REQUIREMENTS FOR A MAJOR IN COMPARATIVE POLICY ANALYSIS

The core requirements for a major in comparative policy analysis include courses in managerial economics, public finance, international economics, quantitative methods, policy analysis, regional courses, and a graduate policy seminar (three-quarter sequence). In addition to the core requirements, students must take three micro-processes courses and three macro-processes courses from thematic and regional offerings. Other requirements include both a three-course regional requisite and a four-course minor.

Specific course requirements for all Ph.D. major and minor fields of study are available through the IR/PS Office of Student Affairs.

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:

1. An individualized one-year program leading to a Certificate of Study
2. Opportunities to interact with world-renowned Pacific Rim scholars and policymakers
3. Special seminars and lectures by academics and professionals
4. Programmatic activities relevant to policy, trade, and financial issues

5. Group programs to explore diversities and commonalities within represented countries
6. 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.

Courses

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.

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 434A. Modern Japanese Political Economy and Decision Making (4)

An advanced-level survey of modern Japanese political and economic development since the Meiji Restoration, with attention to some of the main controversies concerning Japan, including the place of Japanese culture in Japan's achievements, the failure of prewar democracy and the rise of militarism, and continuities between prewar and postwar Japan.

IP/Core 434B. Modern Japanese Political Economy and Decision Making (4)

An analysis of the core institutions in Japanese society (ruling party, bureaucracy, and "zaikai" [big business]) and how they interact with each other. Attention will also be given to the changing place of law in the Japanese system and to the costs and benefits of Japanese innovations in management and labor relations. *Prerequisite: IP/Core 434A.*

IP/Core 438. 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/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. 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. *Prerequisites: IP/Core 411, or consent of instructor.* Conjoined with Political Science 144D and 262.

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 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 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. *Prerequisite: 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 in financial planning. Course format will be mostly lectures, with occasional cases. Some international aspects of corporate finance will also be discussed. *Prerequisite: IP/Core 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 427. Comparative Management Systems (4)

A survey of recent research comparing management systems, in particular, those of Japan and the U.S. The topics to be covered are strategic management, organization structures, personnel systems, work attitudes, and compensation plans. Systematic data, as well as case studies, will be presented.

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 430. The Comparative Politics of International Financial Markets (4)

This course examines the interaction between political and market forces in the rapidly changing international financial markets. Students are introduced to theories of regulation, an his-

torical overview of financial markets in comparative perspective, and analysis of the current global trend towards financial deregulation.

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 or 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 in-

clude 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 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 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 454. Comparative Welfare States/Social Policies (4)

Growth of the welfare state in advanced industrial societies, current tensions and transformations in contemporary welfare states. Empirical focus on social security, health, welfare, and labor market policies in Britain, Sweden, Germany, Canada, and the U.S. Conjoined with Sociology 247.

IP/Gen 455. Technology and Trade in Economic Growth (4)

Examination of the latest research on economics of technological change, role of trade in economic growth, and determinants of economic growth. Focus will be on structures and policies that support or impede growth in different regions.

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' spe-

cialized agencies (UNEP and WMO on ozone depletion and climate change) to mediate environmental disputes. Consideration of nontraditional approaches resolving international environmental problems.

IP/Gen 465. Economy of China (4)

Survey and assessment of China's economic development since 1949. Section 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 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 473. Japan's Foreign and Defense Policies (4)

Examination of major issues in the evolution of Japan's foreign and defense policies. Emphasis will be given to the analytical considerations and policy interests in the management of Japan's foreign relations.

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 479. Regime Change in Latin America (4)

Theories and case studies of regime change, including transitions to democracy and the breakdown of democracy. Revolution is examined as a special type of regime change. Case studies of countries such as Chile, Peru, Nicaragua, and El Salvador are used. Attention is given to the recurrence of certain political "models," such as the Mexican and Peruvian, with attempts to explain why the imitation of such models is rarely successful.

IP/Gen 480. Health Policy Development in Mexico and Latin America: Implications for U.S.-Mexican Immigration and Border Relations (4)

Analysis of health policies in Mexico and Latin America, with special reference to consequences for the United States. Focus

on country cases, international migration, and the U.S. border region.

IP/Gen 481. Stabilization, Reform, and Internationalization in the World Economy (4)

This course offers a comparative perspective on economies' adaptation to the environment of the nineties. It focuses on international financial change, macrostabilization, and long-term reform in the Pacific Rim and Europe.

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 488. Comparative Cultural Environments (4)

A course on the interpretation of similarities and differences of cultural forms and social forces in order to prepare students to understand and act in different sociocultural settings. Cultural schemas and values underlying a variety of religious and cultural belief systems significantly shape the ways in which people in different societies think and behave.

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 2A-B-C. Second-Year Korean: Korean Conversation (2-2-2)

Tutorial meetings to practice Korean conversation. Must be taken with IP/Lang 2AX, BX, CX. *Prerequisite: IP/Lang 1C and 1CX or equivalent.*

IP/Lang 2AX-BX-CX. Second-Year Korean: Analysis of Korean (3-3-3)

A continuation of IP/Lang 1A, B, C. Through lecture and practices, 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 2A, B, C. *Prerequisite: IP/Lang 1C and 1CX or equivalent.*

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 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 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 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 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 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 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. 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.

IP/Gen 203. 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 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?

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 interna-

tional 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. *Prerequisites: graduate status or consent of instructor. Some background in political science and in quantitative analysis of issues desirable.*

IP/Gen 220A-B-C. Research Seminar: Applied Economic Research (2-2-2)

A three-quarter sequence course consisting of special topics in empirical research and applied econometrics. Each student will be supervised in work on a major empirical project. Empirical research undertaken will be original and designed to give training in the application and integration of theoretical and econometric tools. The topic researched will be related to the Pacific region; and as a result, the student will gain in-depth experience with Pacific data sources. The paper will be presented before the Graduate Policy Seminar. *Prerequisite: successful completion of first year, doctoral level, IR/PS economic course requirements.*

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 occurs, 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 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 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 manufacturing base, international comparison of manufacturing management, 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 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 254. Comparative Welfare States/Social Policies (4)

Growth of the welfare state in advanced industrial societies, current tensions and transformations in contemporary welfare states. Empirical focus on social security, health, welfare, and labor market policies in Britain, Sweden, Germany, Canada, and the U.S. Conjoined with Sociology 247.

IP/Gen 255. Technology and Trade in Economic Growth (4)

Examination of the latest research on economics of technological change, role of trade in economic growth, and determinants of economic growth. Focus will be on structures and policies that support or impede growth in different regions.

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)

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/Gen 261. Chinese Politics (4)

This course will analyze post-1949 Chinese politics, including political institutions, the policymaking process, and citizen po-

litical 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 265. Economy of China (4)

Survey and assessment of China's economic development since 1949. Section 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 270A. Modern Japanese Political Economy and Decision Making (4)

An advanced-level survey of modern Japanese political and economic development since the Meiji Restoration, with attention to some of the main controversies concerning Japan, including the place of Japanese culture in Japan's achievements, the failure of prewar democracy and the rise of militarism, and continuities between prewar and postwar Japan.

IP/Gen 270B. Modern Japanese Political Economy and Decision Making (4)

An analysis of the core institution in Japanese society (ruling party, bureaucracy, and *zaikai* [big business]) and how they interact with each other. Attention will also be given to the changing place of law in the Japanese system and to the costs and benefits of Japanese innovations in management and labor relations. *Prerequisite: IP/Core 434A or IP/Gen 270A.*

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 273. Japan's Foreign and Defense Policies (4)

Examination of major issues in the evolution of Japan's foreign and defense policies. Emphasis will be given to the analytical considerations and policy interests in the management of Japan's foreign relations.

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 279. Health Policy Development in Mexico and Latin America: Implications for U.S.-Mexican Immigration and Border Relations (4)

Analysis of health policies in Mexico and Latin America with special reference to consequences for the United States. Focus on country cases, international migration, and the U.S. border region.

IP/Gen 280A-B-C. Research Seminar: Comparative Analysis of Political Decision Making (4-4-4)

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 281A-B-C. Graduate Policy Seminar (4-4-4)

Three-quarter sequence requirement for all doctoral candidates. Discussion amongst advanced Ph.D. students and faculty of Pacific region policy issues. Students will make presentations of literature reviews, research papers, and a major piece of independent research contributing to the dissertation prospectus.

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.

JAPANESE STUDIES

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 291. Stabilization, Reform, and Internationalization in the World Economy (4)

This course offers a comparative perspective on economies' adaptation to the environment of the nineties. It focuses on international financial change, macrostabilization, and long-term reform in the Pacific Rim and Europe.

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.

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

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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*

Jon R. Snyder, 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.

JAPANESE STUDIES

OFFICE: 3071 Humanities and Social Sciences Building, Muir College

Faculty

Takashi Fujitani, *Assistant Professor, History*

Takeo Hoshi, *Assistant Professor, International Relations and Pacific Studies*

Germaine Hoston, *Professor, Political Science*

Hifumi Ito, *Lecturer, Japanese Language*

Noriko Kikuchi, *Lecturer, Japanese Language*

Setsuko Kiyomi, *Lecturer, Japanese Language*

Sige-Yuki Kuroda, *Professor, Linguistics*

Masao Miyoshi, *Hajime Mori Professor of Japanese, English, and Comparative Literature*

Masato Nishimura, *Lecturer, Japanese Language*

Frances Rosenbluth, *Assistant Professor, International Relations and Pacific Studies*

Yasu-Hiko Tohsaku, *Associate Professor, International Relations and Pacific Studies*

Christena Turner, *Assistant Professor, Sociology*

Lisa Yoneyama, *Assistant Professor, Literature*

Joji Yuasa, *Professor, 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 MINOR PROGRAM

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.

Courses

(All graduate-level courses require permission of the instructor for undergraduate students.)
(Course titles may vary from year to year.)

■ HISTORY

HIEA 80. Japan to 1600

HIEA 81. Japan since 1600

HIEA 110. Ancient Japan and the Courtly Society

HIEA 111. Japan in the Age of the Samurai

HIEA 112. Japan's Emergence as a Modern State

HIEA 113. Pearl Harbor and Hiroshima: World War Two in Asia

HIEA 114. Occupied Japan and the Cold War in Asia

HIEA 160. Colloquium on Modern Japanese History

■ LANGUAGE

(All courses are offered annually. The 'A' courses are offered in the fall, 'B' in winter, and 'C' in spring only.)

10A-B-C. First-Year Japanese

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

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

Lit/Th 240. Forms and Genres (Check with program office as to whether this course may be used towards a Japanese studies minor.)

■ MUSIC

(Check with program office as to whether these courses may be used towards a Japanese studies minor.)

111. World Music.

211. Seminar in World Music

■ POLITICAL SCIENCE

133A. Introduction to Japanese Politics

133D. Japanese Foreign Policy

133E. Public Policy in Japan

233. Politics and Political Economy in Contemporary Japan

■ SOCIOLOGY

188G. Japanese Organizational Culture

■ GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

IP/Gen 400. International Relations of the Pacific

IP/Gen 471. Japanese Economy

IP/Gen 472. Cultures of Japanese Business Organizations

IP/Core 434A-B. Modern Japanese Political Economy

IP/Core 473A-D, 474A-D, 475A-D. Japanese Language Maintenance for Professional Proficiency

JUDAIC STUDIES

OFFICE: 4008 Humanities and Social Sciences Building, Muir College

Professors

David Noel Freedman, Ph.D., *History; Endowed Chair, Biblical Studies*

Richard Elliot Friedman, Th.D., *Hebrew and Comparative Literature*

David M. Goodblatt, Ph.D., *History; Coordinator*
Melford E. Spiro, Ph.D., *Anthropology, Professor Emeritus*

Associate Professors

William H.C. Propp, Ph.D., *History*

Jonathan Saville, Ph.D., *Theatre*

Gershon Shafir, Ph.D., *Sociology*

Assistant Professor

Thomas E. Levy, Ph.D., *Anthropology*

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 Cultural Traditions 1A-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 whose principal interest is in Judaic studies also have the following options:

1. Within the Classical Studies Program, students may pursue a major concentrating upon Hebrew/biblical courses offered in the Departments of Literature, History, and Philosophy.
2. Within the general literature major in the Department of Literature, students may concentrate 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.

LATIN AMERICAN STUDIES

Cultural Traditions: Judaic 1A-B-C. (4-4-4)

(Also listed as Philosophy 30A-B-C.)

An introductory survey of the Jewish people and Jewish civilization from the Bible to the present day.

Judaic Studies 1. Beginning Hebrew (4)

Acquisition of basic vocabulary, fundamentals of Hebrew grammar, conversation, and reading.

Judaic Studies 2. Intermediate Hebrew (4)

Continued study of vocabulary and grammar, emphasis on fluency in conversation, and reading.

Judaic Studies 3. Intermediate Hebrew, Continued (4)

Vocabulary, grammar, conversation, introduction to literary and nonliterary texts.

Judaic Studies 101. Introduction to Hebrew Texts (4)

Reading and analysis of texts from Biblical through modern authors, study of advanced vocabulary and grammar. Course taught in Hebrew and in English.

Judaic Studies 102. Intermediate Hebrew Texts (4)

Further reading and analysis of Hebrew literature from a range of periods. Advanced grammar and vocabulary. Course taught in Hebrew and in English.

Judaic Studies 103. Advanced Hebrew Texts (4)

Synthesis of fluency, reading, and grammatical skills. Reading of texts from a range of periods.

Judaic Studies 105. Modern Jewish Thought (4)

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/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 to 8)

(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)

L ANGUAGE

See particular languages under linguistics (beginning and intermediate) or literature (advanced).

L ATIN AMERICAN STUDIES

OFFICE: 117 Institute of the Americas Building

Professors

George Borjas, Ph.D., *Economics*

Jaime Concha, Ph.D., *Literature*

Wayne Cornelius, Ph.D., *Political Science*

Paul Drake, Ph.D., *Political Science/History*

Ramon Gutierrez, Ph.D., *History*

David Ringrose, Ph.D., *History*

Peter H. Smith, Ph.D., *Political Science, Program Chair*

Carlos Waisman, Ph.D., *Sociology*

Adjunct Professor

Joseph Grunwald, Ph.D., *Economics*

Associate Professors

Rae Blumberg, Ph.D., *Sociology*

Ann Craig, Ph.D., *Political Science*

Dee Dee Hallek, B.A., *Communication*

Daniel Hallin, Ph.D., *Communication*

Jorge Huerta, Ph.D., *Theatre*

David Mares, Ph.D., *Political Science*

Michael Monteon, Ph.D., *History*

Marta Sanchez, Ph.D., *Literature*

Rosaura Sanchez, Ph.D., *Literature*

Harley Shaiken, B.A., *Communication*

Eric Van Young, Ph.D., *History*

Leon Zamosc, Ph.D., *Sociology*

Assistant Professors

Juan Diez-Medrano, Ph.D., *Sociology*

James Holston, Ph.D., *Anthropology*

Christine Hunefeldt, Ph.D., *History*

Graciela Kaminsky, Ph.D., *Economics*

Matthew Shugart, Ph.D., *International Relations and Pacific Studies*

Marcelo Suarez-Orozco, Ph.D., *Anthropology*

MINOR IN LATIN AMERICAN STUDIES

Language prerequisite: successful completion of two years of college-level Spanish or Portuguese (or the equivalent thereof).

In addition to the language prerequisite, a minor in Latin American studies consists of six courses, of which at least three must be upper-division courses dealing with Latin America. The remaining three courses may be at the lower- or upper-division level. All six courses must focus on Latin America or provide instruction in Spanish-American literature or in the Portuguese language. No more than three of the courses can be taken in any single department.

All six courses must be taken for a letter grade. Approved courses taken at other universities or through participation in the Education Abroad Program may be included as part of the minor. Courses for the minor must be approved by the student's college and by the Committee on Latin American Studies.

The following is a partial list of courses approved to satisfy these requirements:

ANTHROPOLOGY

- 100: Power and Resistance
- 102: Latin American Societies and Cultures
- 125: Contemporary Central America
- 134: The Cultures of Mexico
- 145: Topics in Latin American Societies and Cultures

ECONOMICS

- 161: Latin American Economic Development

ETHNIC STUDIES

- 133: Hispanic American Dramatic Literature
- 134: La Chicana
- 180: Topics in Mexican-American History

HISTORY

- 100: Colonial Latin America: Era of Conquest
- 101: Colonial Latin America: The Mature Colonies
- 102: Latin America in the Twentieth Century
- 105: South America: Labor, Coercion, and the Society in the Nineteenth Century
- 110: Progress and Poverty in South America: 1820-1930
- 111: Progress and Poverty in South America: 1930-Present
- 112: Economic and Social History of the Andean Region
- 113: Lord and Peasant in Latin America
- 114: Social History of Colonial Latin America
- 115: The Latin American City, a History
- 117: Indians, Blacks, and Whites: Family Relations in Latin America
- 120: History of Argentina
- 121: History of Brazil
- 122: Cuba: From Colony to Socialist Republic
- 131: A History of Mexico
- 132: A History of Contemporary Mexico

Colloquia:

- 160: Topics in Latin American Colonial History

- 161: History of Women in Latin America
- 162: Special Topics in Latin American History
- 164: The Political Economy of Argentina
- 166: Cuba: From Colony to Socialist Republic
- 170: Topics in Latin American History, 1820-1910
- 171: Special Topics in Latin American History since 1910
- 172: Machismo and Matriarchy: The Latin American Social Structure
- 199: Independent Study in Latin American History

LINGUISTICS

Basic Portuguese language courses (third-year level or higher).

LITERATURE

- Lit/Gen 136: Latin American Literature in Translation
- Lit/Gen 137: Mexican Literature in Translation
- Lit/Sp 130B: Development of Latin American Literature
- Lit/Sp 131: Spanish American Literature: The Colonial Period
- Lit/Sp 132: Spanish American Literature: The Nineteenth Century
- Lit/Sp 133: Spanish American Literature: The Twentieth Century
- Lit/Sp 134: Argentine Literature
- Lit/Sp 135: Mexican Literature
- Lit/Sp 136: Peruvian Literature
- Lit/Sp 137: Caribbean Literature
- Lit/Sp 140: Spanish American Novel
- Lit/Sp 141: Spanish American Poetry
- Lit/Sp 142: Spanish American Short Story
- Lit/Sp 143: Spanish American Essay
- Lit/Sp 144: Spanish American Theatre
- Lit/Sp 163: Spanish Language in America
- Lit/Sp 164: Language and Society
- Lit/Sp 172: Indigenista Themes in Spanish-American Literature
- Lit/Sp 173: Problems in Spanish and Spanish-American Literary History

POLITICAL SCIENCE

- 134AA: Comparative Politics of Latin America
- 134AB: Comparative Socialist Experiments in 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 Politics in Latin America
- 134N: Politics in Central America
- 146A: The U.S. and Latin America: Political and Economic Relations
- 146BA-BB: Seminar in Mexico and U.S.-Mexican Relations
- 146D: Political Parties in Latin America
- 196B-C: Fieldwork in U.S.-Mexican Studies

SOCIOLOGY

- 188D: Latin America: Society and Politics

MASTER'S DEGREE PROGRAM

The Faculty Group in Latin American Studies is composed of professors housed in their respective departments. The group offers an interdisciplinary M.A. in Latin American studies. That degree requires:

1. Foreign language competence in Spanish or Portuguese;
2. Forty units of course work in at least three departments, with no more than sixteen units in any one department; four of those units must be taken in the Latin American Studies Core Seminar. A list of approved courses is available from the Faculty Group in Latin American Studies;
3. Successful completion of either a comprehensive examination or a master's thesis.

Courses

This course is required for Latin American studies M.A. graduate students.

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.*

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, history, linguistics, philosophy, political science, psychology, sociology, and urban studies and planning. To assure an interdisciplinary learning experience, students must include in their program at least one course from each of the following academic departments: history, philosophy, political science, and sociology.

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. Students who complete the law and society course work but do not use it as a minor (or program of concentration) may have a special notation placed on their transcript certifying completion of the course work. Transcript notation requests must be obtained from and approved by the Interdisciplinary Programs Office. 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 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. Warren College sponsors the Earl Warren Symposium dedicated to the analysis of a socially relevant legal topic. The symposium includes lectures and discussions by members of the legal community and the UCSD faculty, informal debates, student panels, and a moot court presentation. Selected students from community high schools are invited to attend, along with their instructors. The symposium is open to all UCSD students, staff, and faculty as well as to the community at large.

Information, workshops, and additional law-related programs are also offered by the Career Services Center, the student Pre-Law Education Association (PLEA), 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.

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 162—Philosophy of Law

Sociology 140—Sociology of Law

Two electives chosen from the following:

Communication/SF

139A-B—Law, Communication, and Freedom of Expression

Economics

118A or B—Law and Economics

History U.S.

152—The Trials of America

153—American Political Trials

169—American Legal and Constitutional History

Linguistics/Gen

105—Law and Language

Philosophy

12—Logic and Decision Making

120—Political Philosophy

121—The State and Freedom

122—Biomedical Ethics

124—Contemporary Moral Issues

127—Professional Ethics

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

If there are courses with substantial legal content, students may petition to substitute courses in the minor. 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. Students should consult the Interdisciplinary Programs Office for further information on Law and Society 101.

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: 5237 McGill Hall, Muir College

Professors

Matthew Y. Chen, Ph.D.
Jeffrey-L. Elman, Ph.D.
S.-Y. Kuroda, Ph.D., *Chair*
Ronald W. Langacker, Ph.D.
David M. Perlmutter, Ph.D.
Sanford A. Schane, Ph.D.

Assistant Professors

Farrell Ackerman, Ph.D.
Adele Goldberg, Ph.D.
Suzanne Kemmer, Ph.D.
Robert Kluender, Ph.D.
John Moore, Ph.D.

Professors Emeritus

Edward S. Klima, Ph.D.
Margaret Langdon, Ph.D.
Leonard Newmark, Ph.D.

Linguistics is the study of language. Like other rapidly developing fields, linguistics resists simple classification into one of the traditional categories of academic disciplines. As one of the humanities, linguistics is concerned with the historical development of a particular language or language family, or with the relation between language and literature. As a social science, linguistics may be related to anthropology, in describing language as part of culture; or it may be related to psychology, in describing language as a kind of human behavior. One branch of linguistics, phonetics, may even be considered a natural science, related to the physical science of acoustics and the biological sciences of anatomy and physiology. As an applied science, linguistics has found many applications in fields as far apart as language pedagogy, speech therapy, and computer programming. Finally, linguistics may be considered a formal science in its own right, related to mathematics and formal logic.

A linguistics 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 Department of Linguistics at UCSD also offers elementary instruction in a variety of foreign languages.

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. Transfer students should note that at least six of the ten required upper-division linguistics courses counted towards the major must be taken in residence at UCSD. A 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.

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 courses numbered 141 and above in certain years.

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 141, 143, 147 and 151 may be repeated for credit, each repetition counting toward the major):

- Ling/Gen 115: Phonology II
- Ling/Gen 125: Syntax II
- Ling/Gen 141: Language Structures
- Ling/Gen 142: Language Typology
- Ling/Gen 143: Romance Linguistics
- Ling/Gen 145: American Indian Linguistics
- Ling/Gen 146: Structure of Japanese
- Ling/Gen 150: Historical Linguistics
- Ling/Gen 151: Language History
- Ling/Gen 154: History of English

OTHER LINGUISTICS ELECTIVES

- Ling/Gen 104: Concepts and Categories
- Ling/Gen 105: Law and Language
- Ling/Gen 160: Mathematical Background in Formal Linguistics
- Ling/Gen 163: Computational Linguistics
- Ling/Gen 170: Psycholinguistics
- Ling/Gen 172: Language and the Brain
- Ling/Gen 175: Sociolinguistics
- Ling/Gen 177: Theories and Methods of Foreign Language Acquisition

LINGUISTICS

Ling/Gen 178: Bilingualism and English as a Second Language
Ling/Gen 182: Linguistics and Poetics
Ling/Gen 184: Writing Systems

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

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, 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 Theoretical Linguistics)."

Theoretical Linguistics

5 required linguistics courses
Ling/Gen 115: Phonology II
Ling/Gen 125: Syntax II
Ling/Gen 160: Mathematical Background in Formal Linguistics, or a core linguistics elective
2 core linguistics electives or relevant courses offered in philosophy or cognitive science, selected in consultation with the faculty adviser for theoretical linguistics
4 linguistics electives (core or other)

Linguistics with Concentration in a Particular Language

5 required linguistics courses
1 course selected from:
Ling/Gen 143: Romance Linguistics (for concentration in a Romance language)
Ling/Gen 150: Historical Linguistics
Ling/Gen 151: Language History (in language of concentration)
Ling/Gen 154: History of English
3 upper-division courses taught in the language of concentration
5 linguistics electives (core or other). Courses particularly relevant to this specialization are:
Ling/Gen 141: Language Structures (in language of concentration)

Ling/Gen 146: Structure of Japanese (for concentration in Japanese)
Ling/Gen 177: Theories and Methods of Foreign Language Acquisition
Ling/Gen 182: Linguistics and Poetics

Language and Mind

5 required linguistics courses
2 core linguistics electives
3 courses related to language and cognition 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 163: Computational Linguistics
Ling/Gen 170: Psycholinguistics
Ling/Gen 172: Language and the Brain

Language and Computers

5 required linguistics courses
2 core linguistics electives
3 courses offered in the Departments of Computer Science and Engineering or Cognitive Science, selected in consultation with the faculty adviser for language and computers
4 linguistics electives (core or other). Courses particularly relevant to this specialization are:
Ling/Gen 125: Syntax II
Ling/Gen 160: Mathematical Background in Formal Linguistics
Ling/Gen 163: Computational Linguistics

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 105: Law and Language
Ling/Gen 175: Sociolinguistics



English as a Foreign 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 154: History of English
 - Ling/Gen 175: Sociolinguistics
 - Ling/Gen 177: Theories and Methods of Foreign Language Acquisition
 - Ling/Gen 178: Bilingualism and English as a Second Language

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.

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 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 (Linguistics 198) or independent study

in linguistics (Linguistics 199). No more than one such course (to be taken Pass/Not Pass) may count toward the major.

THE MINOR PROGRAM

Fifth, Muir, and Third: For Fifth, Muir, and Third Colleges, the linguistics minor consists of six courses: Linguistics 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 Linguistics 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 Linguistics 198 or 199. Only one quarter of Ling/Gen 198 or 199 may be counted toward the minor.

THE PH.D. PROGRAM

The Department of Linguistics offers a Ph.D. program that is unique in its primary emphasis on modern linguistic theory combined with serious study of a wide range of languages and language families from around the world, in particular African languages, American Indian languages, American Sign Language, Chinese, Germanic, Hungarian, Japanese, and Romance. This emphasis is complemented by unusually strong offerings and research interests in grammatical theory, comparative-historical linguistics, formal linguistics, computational linguistics, language processing, phonology, and first- and second-language acquisition. The department has a wide array of research facilities. The phonetics laboratory contains equipment for research in acoustic and articulatory phonetics as well as speech perception. The department houses an event-related brain potential laboratory, a spectrograph, and various computer systems, including a general-

purpose network used by faculty, students, and staff; the department also has ready access to the campus computer network. In addition to the extensive linguistics holdings in the main library, the department maintains a reading room with a collection of research reports, dissertations, and unpublished papers. Access to the libraries of other UC campuses exists through interlibrary loan.

The department's language laboratory maintains a library of written and recorded materials permitting independent study of dozens of common and "exotic" languages; it includes a micro-computer facility for self-instruction in French, German, and Spanish. Since the Linguistics Language Program provides basic foreign language instruction for the campus, graduate students who are interested in second-language pedagogy have an opportunity to develop innovative teaching materials.

The department has its own excellent tape and videotape recording facilities for work in sociolinguistics, anthropological linguistics, psycholinguistics, and the sign language of the deaf. The Center for Research in Language facilitates research over a broad range of projects concerned with theoretical and applied problems. Finally, UCSD is ideally located from the standpoint of availability of native speakers of a wide variety of languages.

In the first two years of graduate study, the student's basic courses stress linguistic theory and linguistic analysis. For advanced work, students choose an area of specialization based on individual interests.

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. Applicants are expected to have substantial experience with foreign languages. Students with no previous course work in linguistics proper are advised to become acquainted with the fundamentals of contemporary linguistic theory prior to enrollment. Students who, upon admission, are deficient either in their formal linguistic preparation or languages will be advised by the department on how to make up the deficiency. 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 two languages, to be chosen from: French, German, Russian, and Spanish. A student whose native language is not English may use English as one of the languages to satisfy the reading knowledge requirement, the other being one of the four languages above which is not his or her first language.

REQUIRED COURSES

Candidates for the Ph.D. must pass certain graduate courses prior to taking the qualifying examination. These include five courses in the general area of syntax (221A, 221B, 221C, and two offerings of 222A); four courses in phonology (211A, 211B, and two chosen from 212, 213, and 215); and a two-quarter field methods sequence.

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 the Central University 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 (eight of which must be graduate courses in the Department of Linguistics at UCSD); 2) passing the comprehensive evaluation at the end of the fifth quarter; and 3) demonstrating reading proficiency in one language, to be chosen from among French, German, Russian, and Spanish. A student whose native language is not English may use English to satisfy this requirement.

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

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

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 lab-

oratory 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, three, or four units of credit. For some languages, the course may be repeated for credit.

■ CHINESE

See: Chinese Studies

■ FRENCH

Ling/Fr 1A. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Ax. *Prerequisite: no prior study of French required.*

Ling/Fr 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 Ling/French 1A. *Prerequisite: no prior study of French required.*

Ling/Fr 1B. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Bx. *Prerequisite: Ling/French 1A or equivalent.*

Ling/Fr 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 Ling/French 1B. *Prerequisite: Ling/French 1Ax or equivalent.*

Ling/Fr 1C. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Cx. *Prerequisite: Ling/French 1B.*

Ling/Fr 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 Ling/French 1C. *Prerequisite: Ling/French 1Bx.*

Ling/Fr 1D. French Conversation (2.5)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Dx. *Prerequisite: Ling/French 1C.*

Ling/Fr 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 Ling/French 1D. *Prerequisite: Ling/French 1Cx.*

Ling/Fr 11. Elementary French Reading (2-4)

A self-instructional program designed to prepare graduate students to meet reading requirements in French. After a one-week introduction to French orthography/sound correspondence, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also: **Department of Literature**

■ GERMAN**Ling/Ge 1A. German Conversation (2.5)**

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Ax. *Prerequisite: no prior study of German required.*

Ling/Ge 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 Ling/German 1A. *Prerequisite: no prior study of German required.*

Ling/Ge 1B. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Bx. *Prerequisite: Ling/German 1A or equivalent.*

Ling/Ge 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 Ling/German 1B. *Prerequisite: Ling/German 1Ax or equivalent.*

Ling/Ge 1C. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Cx. *Prerequisite: Ling/German 1B.*

Ling/Ge 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 Ling/German 1C. *Prerequisite: Ling/German 1Bx.*

Ling/Ge 1D. German Conversation (2.5)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Dx. *Prerequisite: Ling/German 1C.*

Ling/Ge 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 Ling/German 1D. *Prerequisite: Ling/German 1Cx.*

Ling/Ge 11. Elementary German Reading (2-4)

A self-instructional program designed to prepare graduate students to meet reading requirements in German. After a one-week introduction to German orthography/sound correspondences, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also: **Department of Literature**

■ GREEK

See: **Department of Literature**

■ HEBREW

See: **Judaic Studies**

■ ITALIAN**Ling/It 1A. Italian Conversation (2.5)**

Must be taken in conjunction with Ling/Italian 1Ax. *Prerequisite: no prior study of Italian required.*

Ling/It 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 Ling/Italian 1A. *Prerequisite: no prior study of Italian required.*

Ling/It 1B. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Bx. *Prerequisite: two or more years of Italian in high school or Ling/Italian 1A, or equivalent.*

Ling/It 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 Ling/Italian 1B. *Prerequisite: two or more years of Italian in high school or Ling/Italian 1Ax, or equivalent.*

Ling/It 1C. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Cx. *Prerequisite: Ling/Italian 1B.*

Ling/It 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 Ling/Italian 1C. *Prerequisite: Ling/Italian 1Bx.*

Ling/It 1D. Italian Conversation (2.5)

Must be taken in conjunction with Ling/Italian 1Dx. *Prerequisite: Ling/Italian 1C.*

Ling/It 1Dx. 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 Ling/Italian 1D. *Prerequisite: Ling/Italian 1Cx.*

See also: **Department of Literature**

■ JAPANESE

See: **Japanese Studies**

■ LATIN

See: **Department of Literature**

■ PORTUGUESE**Ling/Port 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.)*

■ RUSSIAN

See: **Department of Literature**

■ SPANISH**Ling/Sp 1A. Spanish Conversation (2.5)**

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Ax. *Prerequisite: no prior study of Spanish required.*

Ling/Sp 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 Ling/Spanish 1A. *Prerequisite: no prior study of Spanish required.*

Ling/Sp 1B. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Bx. *Prerequisite: Ling/Spanish 1A or equivalent.*

Ling/Sp 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 Ling/Spanish 1B. *Prerequisite: Ling/Spanish 1Ax or equivalent.*

Ling/Sp 1C. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Cx. *Prerequisite: Ling/Spanish 1B.*

Ling/Sp 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 Ling/Spanish 1C. *Prerequisite: Ling/Spanish 1Bx.*

Ling/Sp 1D. Spanish Conversation (2.5)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Dx. *Prerequisite: Ling/Spanish 1C.*

Ling/Sp 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 Ling/Spanish 1D. *Prerequisite: Ling/Spanish 1Cx.*

Ling/Sp 15. Intermediate Spanish for the Social Sciences (2)

(Formerly Ling/Sp 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**Lang/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, three, or four units of credit and may be repeated up to the total number of units available for that language.

Afrikaans	Burmese
Albanian	Chinese (Cantonese)
American Sign Language	Chinese (Mandarin)
Arabic (Eastern)	Czech
Arabic (Egyptian)	Danish
Arabic (Iraqi)	Dutch
Arabic (Moroccan)	Esperanto
Arabic (Saudi)	Finnish
Bengali	French
Bulgarian	German

Greek (Modern)	Norwegian
Haitian Creole	Persian
Hausa	Polish
Hawaiian	Portuguese
Hebrew (Modern)	Romanian
Hindi-Urdu	Russian
Hungarian	Serbo-Croatian
Igbo	Spanish
Irish Gaelic	Swahili
Italian	Swedish
Japanese	Tagalog
Kannada	Thai
Korean	Tibetan
Latvian	Turkish
Lithuanian	Twi
Malay	Vietnamese
Mongolian	Welsh
Navajo	Yoruba

Courses

LINGUISTICS

LOWER DIVISION

3A. 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.

3B. 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, the law, and artificial intelligence.

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 language and linguistics. Language as an instrument of communication. Aspects of the structure of English and other languages. Survey of linguistic sub-disciplines.

41. Language and Human History (4)

The genetic relationships between the world's languages, their contribution to the understanding of history. Other topics: criteria for language families; the contributions of nineteenth-century linguists, and views of language and language families that emerged from the study of Native American languages.

47. English Vocabulary Elements (4)

Introduction to the study of words in English from a structural and historical standpoint focussing on how words are built up from smaller meaningful units. Designed to introduce students to whole families of words.

63. Language of the Computer (4)

Differences between human and computer languages. Overview of UNIX and the roles played by hardware and software. Editors, word-processing programs, utilities, C-shell scripts.

71. 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.

75. Language and Society (4)

Focus on language in its social context. Topics include but are not limited to: bilingualism, literacy, dialects, Black English, language planning, gender. Illustrated with case studies from a variety of social contexts and cultural settings.

76. The Language of Persuasion (4)

An examination of the ways in which language is employed in advertising and politics to control the beliefs and behavior of populations.

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.

105. Law and Language (4)

The interpretation of language in understanding the law: the language of courtroom interaction (eyewitness testimony, jury instructions); language-based issues in the law (free speech and the First Amendment, libel and slander); written legal language (contracts, ambiguity, 'legalese', legal fictions). Readings include case studies, legal articles, and linguistic texts. *Prerequisite: upper-division standing.*

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 the phonological structure of natural languages. Exercises in phonological description. The empirical justification of phonological analyses. *Prerequisite: Linguistics 110.*

115. Phonology II (4)

Current theoretical approaches to the sound structure of languages. *Prerequisite: Linguistics 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: Linguistics 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: Linguistics 10 or consent of instructor.*

125. Syntax II (4)

Topics in the syntax of English and other languages. Syntactic theory and universals. *Prerequisite: Linguistics 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. Languages and language families likely to be examined

include African Languages, American Sign Language, Chinese, Germanic, Hungarian, Japanese, Luiseño, Romance, Slavic, Uto-Aztecan, and others. Because the subject matter varies from quarter to quarter, this course may be repeated for credit.

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.

145. American Indian Linguistics (4)

A survey of American Indian languages, their genetic relationships and areal groupings. Specific languages and families are selected for more detailed discussion, illustrating questions of relevance to linguistic theory and analysis, sociolinguistics, and applied linguistics.

146. Structure of Japanese (4)

Introduction to linguistic theory through the study of grammatical structures of Japanese. Emphasis is on the syntactic structure of Japanese and its comparison with English syntax. *Prerequisite: Japanese Studies 11 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: Linguistics 111.*

151. Language History (4)

Examination of the historical development of one language or a group of related languages. Languages and language families likely to be considered include Chinese, Germanic, Japanese, Romance, Uto-Aztecan, and others. Because its subject matter varies, this course may be repeated for credit.

154. History of English (4)

General trends in the historical development of the English language, its sounds and its grammar.

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 variable, and may include: parsing theory; computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

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.

172. Language and the Brain (4)

Basic neuroanatomical and neuropsychological aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

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.

177. Theories and Methods of Foreign Language Acquisition (4)

This course examines linguistic, psychological, and pedagogical arguments that underlie various language teaching programs.

178. Bilingualism and English as a Second Language (4)

Sociolinguistic aspects of bilingualism especially as applied to the teaching of English to language minority groups in the United States. Methodology of teaching in an "English as a second language" or bilingual program. *Prerequisite: upper-division standing or consent of instructor.*

182. Linguistics and Poetics (4)

Formal poetics, a linguistic approach to various forms of literature. Fundamentals of linguistics are related to various current theories of literature. Special attention is given to structuralist analyses of literature including those by Jakobson and the generative grammarians.

184. Writing Systems (4)

The development and structure of writing systems. The relation between the orthography of a language and its phonology and morphology.

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 in 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

NOTE: Unless otherwise specified, the following graduate courses may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

200. Research Forum (2)

A forum for discussion of current issues. (S/U grades only.) May be repeated for credit.

210. Phonetics (4)

Anatomy and physiology of the mechanisms used in speech. Acoustic phonetics. Speech perception. Additional topics such as neurolinguistics, acquisition, distinctive feature theory, phonetic explanation in phonology. Practice in transcription and production of the international phonetic alphabet.

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: Linguistics 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, neurolinguistics. Laboratory techniques and computer tools in these areas will be covered. May be repeated for credit when topics vary.

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-B-C. Introductory Syntax (4-4-4)

Foundations of syntactic theory. The notion of an explicit grammar, argumentation, and basic results of generative grammar. Issues that bring conflicting assumptions about linguistic structure into focus, with emphasis on discoveries resulting from the testing of alternative formulations. These courses aim to develop an understanding of theoretical alternatives, of the underlying assumptions and empirical results on which each is based, and of the role of theory in fostering discoveries about language.

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.

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.

227. Comparative Grammatical Structures (4)

The purpose of this course is to combine the intensive study of a single language with a cross-linguistic perspective. The course focuses on selected phenomena in the grammar of one language, comparing them with analogous phenomena in other languages. Since the language chosen for intensive study will vary from year to year, the course may be repeated for credit.

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.

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.

240A-B. Field Methods (4-4)

The techniques of discovering the structure of a language through elicitation of data from native consultants under simulated field conditions. The first quarter typically focuses on

phonetics/phonology, the second on syntax/semantics. May be taken for a letter grade only.

241. Language Structures (4)

Detailed investigation of the structure of one or more languages. Languages and language families likely to be examined include African languages, Chinese, Germanic, Hungarian, Japanese, Romance, Uto-Aztecan, and others. Because the subject matter varies from quarter to quarter, this course may be repeated for credit.

242. Language Typology (4)

The systematic ways in which languages differ. Examination of existing classificatory models and criteria for their evaluation as well as for the construction of viable alternatives. Specific topics may include word order, agreement, case, switch reference, reflexives, voice, evidentials, phonological systems and rule types, accentual systems, etc. Since the topics vary from year to year, this course may be repeated for credit.

243. Romance Linguistics (4)

Topics concerning the history or structure of the Romance languages. Investigation of particular semantic, syntactic, morphological, 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.

245. Topics in American Indian Linguistics (4)

Subjects covered may include: the genetic classification of American Indian languages; the structure of individual languages; change and reconstruction; areal relationships; survey of individual language families. Since the topic can change from year to year, course may be repeated for credit.

248. Morphology (4)

Theories of word structure are examined critically and confronted with data from a variety of languages. The problems studied vary from year to year. They may include issues such as the distinction between derivational and inflectional morphology, the interface between morphology and phonology, and the interface between morphology and syntax.

249. Topics in Sign Languages of the Deaf (4)

The structure of American Sign Language and other gestural languages of the deaf. Perception of language in the visual mode. Since the topic can change from year to year, course may be repeated for credit.

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.

251. Language History (4)

Examination of the historical development of one language or a group of related languages. Languages and language families likely to be considered include Chinese, Germanic, Indo-European, Japanese, Romance, Uto-Aztecan, and others. Because its subject matter varies, this course may be repeated for credit.

255. Topics in Historical Linguistics (4)

Advanced or specialized problems in the analysis of language change and inter-language relationships. Issues in the theory of language change and its implications for synchronic theory and description.

263. Computational Linguistics (4)

Topics variable, and may include parsing theory; computational models of grammar; software tools for language analysis; UNIX operating system; SNOBOL4 and Lisp programming languages. May be repeated for credit when topics vary.

265. Topics in Formal Linguistics (4)

Areas of the study of formal grammars to be selected by the instructor. Topics may include the theory of formal grammars,

with particular emphasis on context-free grammars, relationship of the hierarchies of automata and formal grammars.

270. Psycholinguistics (4)

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

272. Language and the Brain (4)

Basic neuroanatomical and neuropsychological aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

273. Topics in Neurolinguistics (4)

Issues of language representation and neural instantiation that arise in studies of neural imaging, language disorders, bilingualism and second language acquisition, animal communication, and the origins and evolution of language. May be repeated for credit when topics vary.

277A-B. Research in Foreign Language Acquisition (4-4)

Investigation of methods of teaching foreign languages and the theories of language acquisition on which they are based.

288. Topics in the History of Linguistics (4)

Survey of salient features in the development of the various aspects of linguistic theory. Assessment of the contributions of principal schools, such as the neogrammarian, Prague, structuralist traditions. Since the topic can change from year to year, course may be repeated for credit.

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.

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. Fieldwork (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.

LITERATURE

UNDERGRADUATE PROGRAM: 3110 Literature Building

GRADUATE PROGRAM: 3129/3130 Literature Building

ADMINISTRATIVE OFFICE: 3124 Literature Building

Professors

Ronald S. Berman, Ph.D., *English Literature*

Carlos Blanco-Aguinaga, Ph.D., *Spanish 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*

Charles Cooper, Ph.D., *Writing; Coordinator, College Writing Programs*

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*

Frances S. Foster, Ph.D., *American Literature*
Richard Friedman, Th.D., *Hebrew and Comparative Literature*

Marcel Henaff, Ph.D., *French Literature*
Fanny Howe, *Writing*

Susan Kirkpatrick, Ph.D., *Spanish and Comparative Literature*

James K. Lyon, Ph.D., *German Literature; Provost of Fifth College*

Masao Miyoshi, Ph.D., *English, Japanese and Comparative Literature; Hajime Mori Endowed Chair*

Louis Adrian Montrose, Ph.D., *English and American Literature, Chair*

Jerome Rothenberg, M.A., *English and American Literature, Writing*

William S. Tay, Ph.D., *Chinese and Comparative Literature*

Quincy Troupe, B.A., *Writing*

Donald T. Wesling, Ph.D., *English and American Literature, Writing*

Sherley Anne Williams, M.A., *American and Afro-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*

David K. Crowne, Ph.D., *English and Comparative Literature*

Thomas K. Dunseath, Ph.D., *English Literature*
Anthony Edwards, Ph.D., *Classics and Comparative Literature*

William Fitzgerald, Ph.D., *Classics and Comparative Literature*

Stephanie H. Jed, Ph.D., *Italian and Comparative Literature; Women's Studies*

George Mariscal, Ph.D., *Spanish Literature*

Fred V. Randel, Ph.D., *English Literature*

Marta E. Sanchez, Ph.D., *Latin American and Chicano Literature*

Rosaura A. Sanchez, Ph.D., *Spanish Literature*

Kathryn Shevelow, Ph.D., *English and American Literature*

Jon Snyder, Ph.D., *Italian and Comparative Literature*

Barbara Tomlinson, Ph.D., *Writing; Director, Muir College Writing Program*

Cynthia Walk, Ph.D., *German Literature*

Don Edward Wayne, Ph.D., *English Literature*

Assistant Professors

Rosemary George, Ph.D., *English Literature*

Judith Halberstam, Ph.D., *English and American Literature*

Beth Holmgren, Ph.D., *Russian and Comparative Literature*

Todd Kontje, Ph.D., *German and Comparative Literature*

William A. O'Brien, Ph.D., *German and Comparative Literature*

Max Parra, Ph.D., *Mexican and Latin American Literature*

Roddey Reid, Ph.D., *French Literature*

Nicole Tonkovich, Ph.D., *English and American Literature*

Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*

Winifred Woodhull, Ph.D., *French Literature*

Lisa Yoneyama, Ph.D., *Japanese Studies and Cultural Studies*

Oumelbanine Zhiri, Ph.D., *French Literature*

Professors Emeriti

Jack Behar, Ph.D.

Diego Catalan, Ph.D.

Edwin S. Fussell, Ph.D.

Reinhard Lettau, 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*

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 Professors

Fredric Jameson, Ph.D.

Edward Said, 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.

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 college requirements, students who have chosen or are considering a major in literature take the appropriate lower-division language sequence in the Departments 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.)

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, and these must be petitioned through the department.

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 (or a total of five through EAP and the balance 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. Dur-

ing 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—"with distinction," "with high distinction," or "with highest distinction"—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. LTEN 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 literature 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. See the heading, "The Major in Literature," above, for further information about this 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. LFR 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. See the heading, "The Major in Literature," above, for detailed information about this 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. At least one of these must be an upper-division course, except French, where two upper-division courses are required. See the heading, "The Major in Literature," above, for detailed information about this 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
- e. Five additional upper-division courses in Italian literature taught in Italian

2. Three courses in a secondary literature. See the heading, "The Major in Literature," above, for detailed information about this 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. See heading, "The Major in Literature," above, for further information about this 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 119, Cervantes
- d. Six additional upper-division courses in Spanish, Latin American and/or Chicano literature

3. Three courses in a secondary literature. At least one of these must be an upper-division course, except French, where two upper-division courses are required. See the heading, "The Major in Literature," above, for detailed information about this 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.

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.

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 about a period, a genre, or a topic in literary study. Some examples: literature of the ancient world, the novel, poetry, and women's literature. The courses taken to satisfy the requirement in Group A cannot at the same time be applied to Group B (and vice versa).
3. Group C: Any four more upper-division courses in literatures outside the Western tradition (African, Asian, and Latin American). Students who have satisfied this requirement in Group A or Group B may take four upper-division courses from any of the departmental offerings.
4. Three courses in a secondary literature. See the heading, "The Major in Literature," above, for further information about this requirement. 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.
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. No more than a total of two courses in writing may be taken as part of the general literature major.

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 119, 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.

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 effective fall 1991, students must complete the sequence LTWR 8A-8B-8C prior to declaring a major in writing.* The major requirements are as follows:

1. Any of the following literature sequences:
 - a. LTGN 4A-B-C-D-E-F—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 100-127). 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 140-144.
 - 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 Department of Literature courses given in a language other than English. See the heading, "The Major in Literature," above, for further information about this foreign 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, 51, 52, 53, 54
- 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—Any six literature courses. There must be a minimum of three upper-division courses. No more than two courses in writing may be applied toward the general minor.

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. 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 foundational sequence (Literature/Theory 200A-B-C) having a comparatist 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, 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. 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 first quarter of the fourth year. The balance of the fourth year and the whole of the fifth year 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 AND RESEARCH

In keeping with the theoretical interdisciplinary tradition in the department, doctoral students may pursue special studies in composition theory and research. These studies do not constitute a separate degree program, but rather a subspecialty within the Ph.D. program for students with a strong interest in theory and research. Within the department, students in composition

theory have access to a diversified faculty in several national literatures with a variety of approaches to textual analysis, including structuralism and semiotics. Within the department, courses are available in the social and psychological aspects of literature, the pragmatics of the author/reader relationship, and the relations between oral and written discourse. And there are relevant courses in the Departments of Linguistics, Psychology, and Communication. In addition, upper-division undergraduate courses are available on the writing process, forms of written discourse, stylistics, and the teaching of writing. At the graduate level there are research and pedagogy courses and courses in the history of rhetoric. Students may teach in one of the five college freshman writing programs and learn firsthand what is involved in the administration and evaluation of college or university writing programs.

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. Beyond this requirement, students must pass a reading examination (equivalent to two years of study) in a second foreign language. 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, in the case of classical and non-Western languages, 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. Reading ability in French, German, Italian, or Spanish is strongly recommended where these languages are not included among the student's two principal foreign languages.

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 a list of readings to be covered by the written examination of the dissertation field. After the satisfactory completion of the written portion of the examination, 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 four 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 3 for admissions 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.

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 1993-94 ACADEMIC

YEAR) IS AVAILABLE IN THE UNDERGRADUATE OFFICE OF THE DEPARTMENT OF LITERATURE.

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.

LITERATURE

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 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 Mandelstam, Boris Pasternak, Mikhail Bulgakov, Lidia 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

Courses are listed under the heading CRITICAL THEORY/CULTURAL STUDIES, below.

■ LITERATURES IN ENGLISH

LOWER DIVISION

LTEN 17. Introduction to Afro-American Literature (4)

A lecture discussion course that examines a major topic or theme in Afro-American literature as it is developed over time and across the literary genres of fiction, poetry, and *belle lettres*. A particular emphasis of the course is how Afro-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.

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.

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 come-

dies, 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 117C. Seventeenth-Century Prose (4)

Studies in the creation and development of a tradition of English prose style. Topics may include the relationship between the writing of prose and the exploration of human personality, the effects of religious controversy on prose style, or the emergence of a "plain style" under the influence of the New Science.

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 125E. The Romantics and the Visual Arts (4)

An examination of the links between the work of one or more of the romantic writers and specific aspects of iconography and representation in the visual arts.

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 Brontës, 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 siècle* 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 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 mod-

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ernists, among them Pound, H.D., and Eliot; Hemingway, Stein, and Faulkner; Stevens, Moore, and Williams.

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, Rex-roth, Everson, Duncan, and Snyder. May be repeated for credit as topics vary.

LTEN 178. Comparative Ethnic Literature (4)

A lecture-discussion course that juxtaposes the experience of two or more U.S. ethnic groups and examines their relationship with the dominant culture. Students will analyze a variety of texts representing the history of ethnicity in this country. Topics will vary.

LTEN 180. Chicano Literature in English (4)

Introduction to the literature in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. Primary focus on the contemporary period.

LTEN 183. Afro-American Prose (4)

Analysis and discussion of the novel, the personal narrative, and other prose genres, with particular emphasis on the developing characteristics of Afro-American narrative and the cultural and social circumstances that influence their development.

LTEN 184. Afro-American Poetry (4)

Close reading and analysis of selected works of Afro-American poetry as they reflect styles and themes that recur in the literature.

LTEN 185. Themes in Afro-American Literature (4)

An intensive examination of a characteristic theme, special issue, or period in Afro-American literature. May be repeated for credit when topics vary.

LTEN 186. Literature of the Harlem Renaissance (4)

The Harlem Renaissance (1917-39) focuses on the emergence of the "New Negro" and the impact of this concept on black literature, art, and music. Writers studied include Claude McKay, Zora N. Hurston, and Langston Hughes. Special emphasis on new themes and forms.

LTEN 187. Black Music/Black Texts: Communication and Cultural Expression (4)

Explores roles of music as a traditional form of communication among Africans, Afro-Americans, and West Indians. Special attention given to poetry of black music, including blues, and other forms of vocal music expressive of contestatory political attitudes.

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 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 permission of department.*

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

LTEN 211A-B. Old English Literature (4-4)

LTEN 211A is a study of Old English language, forms, and syntax and a reading of some prose and verse. LTEN 211B is a study of Old English poetry.

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. *Prerequisite: graduate standing.*

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 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.*

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.

LTFR 122. Seventeenth Century (4)

Major literary works of the seventeenth century. May be repeated for credit as topics vary.

LTFR 123. Eighteenth Century (4)

Major literary works and problems of the eighteenth century. May be repeated for credit as topics vary.

LTFR 124. Nineteenth Century (4)

Major literary works of the nineteenth century. May be repeated for credit as topics vary.

LTFR 125. Twentieth Century (4)

Major literary works and problems of the twentieth century. May be repeated for credit as topics vary.

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 260. Poetic Analysis (4)

Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will empha-

size 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 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. *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)**

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 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 Third College general-education requirements.

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 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 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.

Non-Western 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 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 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 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 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 Literature (4)

A study of various forms of popular literature, such as the Broadway play, song lyrics, the detective novel, etc. May be repeated for credit as topics vary.

LTGN 175. Words into Images (4)

With the proliferation of comic books, photostories, 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 and Science Fiction (4)

Works of fantasy and/or science fiction will be studied in their cultural context. May be repeated for credit as topics vary.

LTGN 178. Classic Science Fiction Films and Literature (4)

This course will attempt to define in literature and film the genre of science fiction by tracing the development of its characteristic themes and preoccupations from the first major science fiction film, *Metropolis*, to a recent remake of the classic, *The Thing*.

LTGN 179. Contemporary Science Fiction (4)

In the last twenty years or so a new generation of science fiction writers has taken this relatively young literary genre into new realms of subject matter and technique. In this course some of the most recent works of modern science fiction will be read closely and discussed in depth. May be repeated for credit as 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, Sontage, 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.

LITERATURE

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 (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 from year to year, including shamanism, ritual performance, mythopoesis, and oral narration. Repeatable 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 Third College (2-4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Third 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 Fifth College (4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Fifth 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 51-52-53-54. 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: adequate proficiency in German to handle course assignments, i.e., successful completion of LTGM 2C, or equivalent preparation.*

51. Middle Ages and Renaissance
52. Classicism and Romanticism: Eighteenth and Nineteenth Centuries
53. The Twentieth Century
54. Baroque and Enlightenment

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor. Normally, a student will be expected to take two courses of the LTGM 51-52-53-54 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 203. Cultural History of the German Language (4)

Philological survey of the German language, with particular attention to historical, cultural, and social interrelations.

LTGM 210A-B. Middle High German (4-4)

210A: Introduction to the middle High German language. Reading of texts, with exercises in semantics, grammar, etymology, and syntax. 210B: Middle High German II. Analysis of texts representing a variety of genres.

LTGM 221. Middle High German Classicism (4)

Medieval epics (heroic and Arthurian) and courtly poetry. Analysis: methods of interpretation and recent research. May be repeated for credit as topics vary.

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**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.

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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 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**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.*

LITERATURE

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 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 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. *Prerequisites:* 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. *Prerequisites:* 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. *Prerequisites:* 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 102. Topics in Medieval Poetry (4)
Study of Spanish poetry from the eleventh to the fifteenth century. May be repeated for credit as topics vary.

LTSP 107. Literature of the Fifteenth Century (4)
A concentrated study of the Spanish literature of the fifteenth century, including the *Celestina*. May be repeated for credit as topics vary.

LTSP 110A-B. Major Works of the Renaissance and Baroque (4-4)
A survey. Historical, but with close reading of the major (complete) texts of the sixteenth and seventeenth centuries. Garcilaso's poetry, *Lazarillo*, Fray Luis, San Juan, Quevedo, Góngora, Lope de Vega, Tirso de Molina, Calderon, Gracian. Cervantes will be read—but not the *Quijote*.

LTSP 111. Topics in Golden Age Poetry (4)
A study of the thematic and stylistic evolution, from Garcilaso de la Vega to Góngora. Close textual reading of major poems.

LTSP 115. Topics in Golden Age Prose (Except Cervantes) (4)
The topics may vary, as, for example: origins of the modern novel, the picaresque, romances of chivalry, and the appearance of "realism," etc. May be repeated for credit as topics vary.

LTSP 117. Golden Age Drama (4)
A close look at the major themes of the Golden Age drama, with special attention to the theater of Lope, Tirso, and Calderon, "National" theatre, and the baroque.

LTSP 119. Cervantes (4)
A close study of Cervantes' major works. This course is required for all Spanish Literature majors. *Prerequisites:* LTSP 50A and either LTSP 50B or LTSP 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. *Prerequisites: two courses from LTSP 50A-B-C.*

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. *Prerequisite: two courses from LTSP 50A-B-C.*

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 Luis 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 161. Spanish Syntax and Morphology (4)

An analysis of Spanish syntax and morphology to increase the student's ability to speak and write 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 202. Spanish Language in America (4)

Selected topics on the history, structure, and peculiarities of the Spanish language in America. May be repeated for credit as topics vary.

LITERATURE

LTSP 208. Textual Criticism in Spanish (4)

Tools and methods of scholarly research in literature for establishing texts from both manuscript and printed sources.

LTSP 214. Studies in Medieval Literature (4)

Consideration of one or more major figures, texts, trends, or problems in medieval Spanish literature.

LTSP 216. Fifteenth-Century Spanish Literature and Culture (4)

Consideration of one or more major figures, texts, trends, or problems in fifteenth-century Spanish literature. May be repeated for credit as topics vary.

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 261. Studies in Spanish Linguistics (4)

A study of current linguistic and psycholinguistic theories and their application to Spanish. The course will focus on grammatical (syntactic and phonological) programs as well as on contemporary theoretical perspectives in the acquisition of language.

LTSP 264. Bilingualism and Bidialectalism: A Sociolinguistic Study (4)

A study of the relation between language production-reception and contextual factors. The course will examine current theories of language variation and problems of multilingual or bilingual societies determining language shift, maintenance, and standardization.

LTSP 266. Language Teaching: Theory and Methodology (4)

A study of theories of second language acquisition and methodologies proposed for the teaching of a second language, with particular focus on Spanish language instruction.

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.

■ CRITICAL THEORY/CULTURAL STUDIES

Courses in theory/cultural studies 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.

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.

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.

GRADUATE

LTCS 201. Theories and Methods of Analysis in Cultural Studies (4)

Contemporary theories of cultural studies. The seminar will concentrate on major interpretive approaches drawn from several areas of cultural and political analysis, including historicism, Marxist theory, feminism, structuralism, psychoanalytic theory, semiotics, postmodernist studies, gay and lesbian studies, and others. The particular focus and approach may vary. Repeatable for credit. *Prerequisite: graduate standing or consent of instructor.*

LTCS 210. History and Culture (4)

This seminar will focus on the cultural practices of a particular historical period as a means of analyzing the relation between culture/ideology and economic and political modes of production and domination. Topic, historical period, and theoretical approach may vary. Repeatable for credit. *Prerequisite: graduate standing or consent of instructor.*

LTCS 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.*

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: upper-division fiction workshops. 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 craft and formal structure. Techniques of composition (metrics, narrative voice, personification) studied through written examples of this genre. Practical imitations and exercises accompany reading assignments. *Prerequisite: upper-division poetry workshops. 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: upper-division nonfiction prose workshops. Prerequisite: Students must have completed their college writing requirements prior to enrollment in LTWR 8C.*

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 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.

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 the writing of scientific or technical reports. Instructor and students will discuss student work, exploring the particular constraints and possibilities of science writing. May be taken for credit three times. *Prerequisite: LTWR 8C.*

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.*

THE MAKING OF THE MODERN WORLD

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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.*

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.

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 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 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

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OFFICE: Fifth College, Bldg. 412 University Center

The Making of the Modern World is a six-course sequence required of all Fifth 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 exam-

ine 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 Fifth 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 Fifth College requirements, see "Fifth College, General-Education Requirements."

Courses

■ TRADITIONS

1. Prehistory and the Birth of Civilization (4)

The first in a six-quarter sequence constituting a comparative, interdisciplinary, and historical inquiry into "The Making of the Modern World." Students will be introduced to what is known about early humans, including the evolution of the human body and the reconstruction of Paleolithic and Neolithic cultures. Contemporary hunting-and-gathering and tribal societies will be examined to illuminate 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 Fifth 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 Israel, Greece, India, and China. The course covers the great early systems of religious and social thought, using an approach which combines history and social sciences. 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 Fifth College students only. (Letter grade only.) (W)

3. The Medieval Heritage (6)

A survey of the period from the early centuries of the Christian era to the sixteenth century. The following topics will be addressed: Christianity and the birth of Europe; India, Africa, and the rise and spread of Islam; Imperial China and Japan; early cross-cultural contacts (the Crusades and other encounters

among Europeans and peoples of the Near and Far East, Africa, and the Americas). Emphasis will be on the dynamism of medieval societies in contrast to the image of static or "dark" ages. Care will be taken to recreate the popular history of these times: lives of common people, the rise of towns, growth of commerce, popular religion, magic and superstition, entertainments, etc. 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 Fifth College students only. (Letter grade only.) (S)

■ **TRANSFORMATIONS**

4. European Expansion and the Clash of Cultures (4)

An examination of the world from the sixteenth to the end of the eighteenth century. Topics will include the religious reformations in Europe and the fierce competition of the European powers for slaves, souls, and material wealth in Africa, America, and Asia. The course will examine the effects of European expansion on the formerly invincible Ottoman Turks and indigenous people of the "New World," as well as the challenge this expansion posed to China and Japan. Attention will be given throughout to views concerning human relations, nature, and the state that transformed both the European and non-European worlds. The course will conclude with a review of conflicting forces in Europe during the period of the Old Regime and the first phase of world-wide colonial empire. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth 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 seventeenth century to the Russian Revolution and their impact on the non-Western world. Topics will include the absolutist state and the Enlightenment, the French and American revolutions, industrialization, the rise of nationalism and the nation-state, mass politics, 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 Fifth College students only. (Letter grade only.) (W)

6. Our Century and After (4)

Beginning with World War I and the Russian Revolution, a study of developments that set our century apart. The expansion of state power and conflicts between democratic and anti-democratic forces will be examined, along with the social and cultural implications of these developments. Changes in the international system (the end of European hegemony, the rise of the superpowers, decolonization, international economic instability, etc.) and in the character of warfare (particularly the development of nuclear weapons) also will be explored. Finally, the notions of world culture and world system will be addressed. Three hours of lecture, one hour of discussion. *Prerequisite: satisfaction of the Subject A requirement.* Open to Fifth College students only. (Letter grade only.) (S)

- 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*
- Hidenori Murakami, Ph.D., *AMES*
- Johann K. Oesterreicher, Ph.D., *Chemistry*
- Constantin Politis, Ph.D., *Adjunct/ECE*
- M. Lea Rudee, Ph.D., *ECÉ*
- Geert W. Schmid-Schoenbein, Ph.D., *AMES*
- Ivan K. Schuller, Ph.D., *Physics*
- Massoud Simnad, Ph.D., *Adjunct/AMES*
- Richard Skalak, Ph.D., *AMES*
- Frank E. Talke, Ph.D., *AMES*
- T. Don Tilley, Ph.D., *Chemistry*
- Charles W. Tu, Ph.D., *ECE*
- Harry H. Wieder, D.Sc., *ECE*

Associate Professors

- Atul Chokshi, Ph.D., *AMES*
- Sadik Esener, Ph.D., *ECE*
- Richard K. Herz, Ph.D., *AMES*
- John B. Kosmatka, Ph.D., *AMES*
- Jan Talbot, Ph.D., *AMES*

Assistant Professors

- John E. Crowell, Ph.D., *Chemistry*
- Frances Hellman, Ph.D., *Physics*
- Karen L. Kavanagh, Ph.D., *ECE*
- Joanna McKittrick, Ph.D., *AMES*
- Michael J. Sailor, Ph.D., *Chemistry*
- Kenneth S. Vecchio, Ph.D., *AMES*
- 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 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.
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. Remaining courses to complete the thirty-six unit requirement for the M.S. degree may be se-

MATERIALS SCIENCE

OFFICE: 4207 Engineering Building 1, Warren College

Professors

- Siavouche Nemat-Nasser, Ph.D., *AMES, Program Coordinator*
- Gustaf Arrhenius, Ph.D., *SIO*

lected from an approved list of graduate courses with the consent of a faculty adviser.

5. Students either complete a thesis (Plan I) or pass a comprehensive examination (Plan II) as described in the "Graduate Studies" section of this catalog.

6. 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.

THE PH.D. PROGRAM

After completing the M.S. degree or meeting equivalent requirements and meeting the minimum standard on the comprehensive examination to be admitted to 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. Present a Research Seminar. This seminar requirement must be completed before scheduling the Ph.D. Qualifying Examination (Senate Exam).
4. Pass an oral examination (Ph.D. Qualifying Examination) to be advanced to candidacy.
5. 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. (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 sub-atomistic 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 mechanisms 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-Grun-eisen 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)

This course covers the 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, magneto-optic 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 (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.*

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, the fine structure in diffraction patterns, diffraction contrast. Quantitative analysis of crystal defects, phase contrast, and specimen preparation. *Prerequisite: MS 240A or consent of instructor.*

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.*

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. Mechanics of Composite Materials (4)

AMES 233B. Micromechanics (4)

AMES 233C. Fracture Mechanics (4)

AMES 234. Experimental Mechanics (4)

AMES 238. Stress Waves in Solids (4)

AMES 261. Thermodynamics (4)

AMES 256. Rheology of Fluids (4)

AMES 257A. Polymer Processing (4)

AMES 257B. Polymerization Reactor Design (4)

■ ELECTRICAL AND COMPUTER ENGINEERING (ECE)

ECE 220A. Solid State Electronics (4)

ECE 220B. Solid State Electronics (4)

ECE 220C. Solid State Electronics (4)

ECE 221. Thin Film Phenomena (4)

ECE 224. Introduction to VLSI Microfabrication Technology (4)

ECE 233. Structure of Solids (4)

ECE 267. Modern Materials Analysis (4)

■ PHYSICS

Phys. 211. Solid State Physics (5)

MATHEMATICS

OFFICE: 7018 Applied Physics and Mathematics Building, Muir College

Professors

- Jim Agler, Ph.D.
- Donald W. Anderson, Ph.D., *Dean, Division of Natural Sciences*
- Randolph E. Bank, Ph.D.
- M. Salah Baouendi, Ph.D.
- Edward A. Bender, Ph.D.
- James R. Bunch, Ph.D.
- Peter Doyle, Ph.D.
- Thomas J. Enright, Ph.D.
- John W. Evans, M.D., Ph.D.
- 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.
- Richard S. Hamilton, Ph.D.
- J. William Helton, Ph.D.
- James P. Lin, Ph.D., *Vice-Chair*
- Alfred B. Manaster, Ph.D.
- John O'Quigley, Ph.D.
- Jeffrey B. Rimmel, Ph.D.
- Yosef Rinott, Ph.D.
- Burton Rodin, Ph.D.
- Helmut Rohrl, Ph.D.

- Murray Rosenblatt, Ph.D.
- Linda Rothschild, Ph.D.
- Michael J. Sharpe, Ph.D.
- Lance W. Small, Ph.D.
- Donald R. Smith, Ph.D.
- Harold M. Stark, Ph.D., *Chair*
- Audrey A. Terras, Ph.D.
- Adrian R. Wadsworth, Ph.D.
- Nolan R. Wallach, Ph.D.
- Ruth J. Williams, Ph.D.
- Stanley G. Williamson, Ph.D.
- Daniel E. Wulbert, Ph.D.

Associate Professors

- Ian S. Abramson, Ph.D.
- Samuel R. Buss, Ph.D.
- Jeffrey M. Rabin, Ph.D.
- Norman A. Shenk, Ph.D.
- John Wavrik, Ph.D.
- Hans G. Wenzl, Ph.D.

Senior Lecturers in Mathematics

- Patrick J. Ledden, Ph.D., *Provost, Muir College*
- Frank B. Thiess, Ph.D., *Emeritus*

Assistant Professors

- Frederic Bien, Ph.D.
- Bruce K. Driver, Ph.D.
- Mark Haiman, Ph.D.
- Beth Ong, 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.

THE UNDERGRADUATE PROGRAM

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 de-

signed both for students who need a preparatory course before beginning the Mathematics 1 sequence and for students who plan to enroll in the Mathematics 2 sequence but need to strengthen their algebraic skills and facility in graphing and working with exponential and logarithmic functions before enrolling in Mathematics 4C. Mathematics 4C is the department's preparatory course for the Mathematics 2 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.

Mathematics 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 Third College and the option of Warren College and Fifth College.

The other first-year calculus sequence, Mathematics 2A (or 2AH), 2B (or 2BH), and 2C (or 2CH), is taken mainly by students who have completed four years of high school mathematics or have taken a college level precalculus course such as Mathematics 4C. This sequence fulfills all college level requirements met by Mathematics 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 Mathematics 2 since Mathematics 1 is inadequate preparation for many later courses in science and economics.

Students who are considering becoming mathematics majors (including applied mathematics, scientific programming, or mathematics-computer science majors) and others with particular interest in mathematics should arrange their schedules so they can take the honors calculus classes, Mathematics 2AH through Mathematics 2FH, instead of Mathematics 2A through Mathematics 2F whenever possible. These honors classes may be substituted for the corresponding nonhonors classes for all UCSD requirements, except that Mathematics 2DH may not be substituted for Mathematics 2DA in the AMES major. With this exception, any combination of honors and nonhonors calculus classes may be taken.

Certain transfers between the Mathematics 1 and Mathematics 2 sequences are possible, but such transfers should be carefully discussed with an adviser. Able students who begin the Mathematics 1 sequence and who wish to transfer to

the Mathematics 2 sequence, may follow one of three paths, the first of which is highly recommended over the others:

1. Follow Math. 1A with Math. 2A, with two units of credit given for Math. 2A. 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. 2B, receiving two units of credit for Math 2B.
3. Follow Math. 1C with Math. 2B, receiving two units of credit for Math. 2B and two units of credit for Math. 2C.

Credit will not be given for courses taken simultaneously from the Mathematics 1 and the Mathematics 2 sequence.

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.

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. Foreign languages recommended for mathematics majors are French, German, and Russian. See also requirements for all major programs.

All students majoring in mathematics must complete the basic sequence 2A (2AH), 2B (2BH), 2C (2CH), 2DA (2DH), 2EA (2EH), 2F (2FH) and, in so doing, should take as many of the honors classes (2AH-2FH) as they can work into their schedules. Mathematics 89 should be taken in the spring quarter of the sophomore year, but may be taken in the fall, concurrently with Mathematics 140A, 100A, or 103A. In addition to these lower-division courses, math. 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, 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 Mathematics 2DA (2DH), 2EA (2EH), 2F (2FH), and Mathematics 89 before the end of their sophomore year. Either Mathematics 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: 2A (2AH), 2B (2BH), 2C (2CH), 2DA (2DH), 2EA (2EH), and 2F (2FH) with as many honors classes taken in place of the regular classes as possible. (Math. 89 is recommended but not required.)
2. Programming:
Fortran (AMES 10) or C (CSE 75) or Pascal (CSE 62AB or CSE 65)
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. 142AB (or 140AB).
6. One of the following sequences: 180A-B-C (probability), 180A-181A-B (probability and sta-



tistics), or any three courses from 170A-B-C, 172, and 173 (numerical analysis).

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.

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 Mathematics 2DA (2DH), 2EA (2EH), and 2F (2FH) before the end of their sophomore year. 142A-B should be taken during the junior 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, 2A-B-C, or 3A-B-C
2. Instead of (#6) and (#7) in the applied mathematics major, the following sequences are required:

(#6) any three from 170A-B-C, 172, 173
 (#7) 171A-B

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. 2A (2AH), 2B (2BH), 2C (2CH), 2DA (2DH), 2EA (2EH), and 2F (2FH) with as many honors classes taken in place of the regular classes as possible.
2. 89 or 79B
3. One of 79A, CSE 65, CSE 62A-B, CSE 75
4. 79B or CSE 70
5. 103A-B (100A-B may be substituted)
6. 184A
7. 176A and 186A
8. 166A
9. 180A
10. 188
11. 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
 - c) Two from: 140A-B, 142A-B, 176B, 186B, 179A-B, 155A-B, 184B, 166B, 168A-B, 187, 189C, 160A-B, CSE 170A-B, CSE 171A-B, CSE 173
 - d) One mathematics-related elective

In order to graduate by the end of their senior year, students must complete Mathematics 103A, 103B, 166A, 176A and 186A by the end of their junior year.

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 Mathematics 2DA (2DH), 2EA (2EH), 2F (2FH), 79A, 79B, and Mathematics 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, Mathematics 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. 2A [2 if Math. 1A previously/0 if Math. 1A concurrently/0 if Math. 1B or 1C]" means that a student already having credit for Mathematics 1A will receive only two units of credit for Mathematics 2A, but will receive no units if he or she has credit for Mathematics 1B or 1C, and no credit will be awarded for Mathematics 2A if Mathematics 1A is being taken concurrently. Math. 4C cannot be taken for credit after Math. 1 or Math. 2.

1. Math. 2A [2 if Math. 1A previously/0 if Math. 1A concurrently/0 if Math. 1B or 1C]
2. Math. 2B [2 if Math. 1B or 1C previously/0 if Math. 1B concurrently]
3. Math. 2C [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 177], Math. 171A-B [0 if Econ. 172A-B]
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]

Credit will be given for only one from each of the following sets of courses, and either course in a set may be used to replace a D or F in the other course: Math. 2A and 2AH; 2B and 2BH; 2C and 2CH; 2DA and 2DH; 2EA and 2EH; 2F and 2FH.

ADVISERS

Advisers change yearly. Contact the undergraduate office at (619) 534-3590 for the current list.

THE GRADUATE PROGRAM

The Department of Mathematics offers graduate programs leading to the M.A. (pure or applied mathematics), M.S. (statistics), and Ph.D. degrees.

The application deadline for fall admission is January 15. Candidates should have a bachelor's

or master's degree in mathematics or a related field from an accredited institution of higher education or the equivalent. A minimum scholastic average of B or better is required for course work completed in upper-division or prior graduate study. In addition, the department requires *all* applicants to submit scores no older than twelve months from both the GRE General Test and Advanced Subject Test in Mathematics. Completed files are judged on the candidate's mathematical background, qualifications, and goals.

Departmental support is typically in the form of teaching assistantships, research assistantships, and fellowships. These are currently only awarded to applicants to the Ph.D. program.

GENERAL REQUIREMENTS

Full-time students are required to register for no fewer than twelve units every quarter, eight of which must be graduate-level mathematics courses taken for a letter grade. Ph.D. candidates may take these courses on a Satisfactory/Unsatisfactory basis, however, when they advance to candidacy. The remaining four 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*). Mathematics 299 (*Reading and Research*) may only be used by students in the Ph.D. program who have either 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 Mathematics 295 (Special Topics) or Mathematics 500 (Apprentice Teaching).
- d. NO units of Mathematics 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 Mathematics 500 (Apprentice Teaching).
- e. NO UNITS of Mathematics 295 (Special Topics) or Mathematics 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 math. 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 Mathematics 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 Mathematics 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 our 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.

Exams are typically given twice a year, once in June immediately following the end of 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 eight 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 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 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 previously completed.) Three lectures, one recitation. *Prerequisite: Math. 1B.* (F,W,S)

2A. Calculus and Analytic Geometry (4)

Differential and integral calculus of functions of one variable: limits, continuity; differentiation of algebraic and trigonometric functions; applications. Definite integral, primitive functions, fundamental theorem of the calculus. Elements of analytic geometry as needed in the development of the calculus. Three lectures, one recitation. *Prerequisites: passing score on placement examination and either three or more units of high school mathematics or Math. 4C. With a superior performance in Math. 4C no placement examination is required; one-half unit of trigonometry is desirable.* (F,W,S)

2AH. Honors Calculus (4)

This course covers the material in Math. 2A, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2A for all UCSD requirements. Recommended for all prospective mathematics majors and others with particular interest in mathematics. Three lectures, one recitation section. *Prerequisites: the same as for Math. 2A.* (F)

2B. Calculus and Analytic Geometry (4)

Applications of the definite integral, calculus of logarithmic, exponential, and hyperbolic functions. Methods of integration. Separable differential equations. Conic sections. In fall quarters all students who have received credit for Math. 2A by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD should take Math. 2BP (Calculus for AP Students), instead of Math. 2B. Three lectures, one recitation. *Prerequisite: Math. 2A (2AH).* (F,W,S)

2BH. Honors Calculus (4)

This course covers the material in Math. 2B, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2B for all UCSD requirements. Recommended for all prospective mathematics majors and others with particu-

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lar interest in mathematics. Three lectures, one recitation section. *Prerequisite: Math. 2A (2AH).* (F,W)

2BL. Honors Mathematics Laboratory (2)

Symbolic, numerical, and graphical explorations of the material of Math. 2B. Student should have received a grade of A — or better in Math. 2A (or equivalent course). *Prerequisite: Math. 2A with corequisite of Math. 2B or consent of instructor.* (W)

2C. Calculus and Analytic Geometry (4)

Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double and triple integrals. Three lectures, one recitation. *Prerequisite: Math. 2B (2BH).* (F,W,S)

2CH. Honors Calculus (4)

This course covers the material in Math. 2C, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2C for all UCSD requirements. Recommended for all prospective math. majors and others with particular interest in mathematics. Three lectures, one recitation section. *Prerequisite: Math. 2B (2BH).* (F,W,S)

2CL. Honors Mathematics Laboratory (2)

Symbolic, numerical, and graphical explorations of the material of Math. 2C. Student should have received a grade of A — or better in Math. 2B (or equivalent course). *Prerequisite: Math. 2B with corequisite of Math. 2C or consent of instructor.* (S)

2DA. Introduction to Differential Equations (4)

Infinite series. Ordinary differential equations: exact, separable, and linear; constant coefficients, variation of parameters, initial value problems. Series solutions: ordinary points, method of Frobenius. Higher order linear equations: systems, Laplace transforms. Techniques for engineering sciences. Three lectures, one recitation. *Prerequisite: Math. 2C (2CH).* (F,W,S)

2DH. Honors Differential Equations (4)

This course covers the material in Math. 2DA, with somewhat less emphasis on drill and more on theory and infinite series. (Check with your major department to determine whether Math. 2DH fulfills your major requirements.) Recommended for all prospective math. majors and others with particular interest in mathematics. Three lectures, one recitation section. *Prerequisites: Math. 2C (2CH) and consent of instructor.* (F,W,S)

2EA. Introduction to Linear Algebra (4)

Matrix operations, solutions to m linear algebraic equations in n unknowns, linear vector spaces, determinants, matrix eigenvalue problems, multiple eigenvalues, orthonormalization and expansions in orthonormal bases, orthogonal matrices, quadratic and positive-definite forms, simultaneous diagonalization, variational and iterative methods. Applications are directed towards the physical and engineering sciences. Three lectures, one recitation. *Prerequisite: Math. 2C (2CH).* (F,W,S)

2EH. Honors Linear Algebra (4)

This course covers the material in Math. 2EA, with somewhat less emphasis on drill and more on theory. It may be used in place of Math. 2EA for all UCSD requirements. Recommended for all prospective math. majors and others with particular interest in mathematics. Three lectures, one recitation section. *Prerequisite: Math. 2C (2CH).* (F,W,S)

2F. Calculus of Functions of Several Variables (4)

Calculus of vector functions with use of linear algebra. Matrix formulation of the chain rule and the second derivative test for critical points of a function of several variables. Jacobian determinants and change of variables in a multiple integral. Vector fields, line and surface integrals. Stokes' theorem and the divergence theorem. Selected applications. Three lectures, one recitation. *Prerequisites: Math. 2DA (2DH) and Math. 2EA (2EH).* (F,W,S)

2FH. Honors Multivariable Calculus (4)

This course covers the material in Math. 2F, with somewhat less emphasis on drill and more on theory. (Check with your

major department to determine whether Math. 2FH fulfills your major requirements.) Recommended for all prospective mathematics majors and others with particular interest in mathematics. Three lectures, one recitation section. *Prerequisites: Math. 2DA/2DH and Math. 2EA/2EH.* (F,W)

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.)* (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. *Prerequisites: intermediate or college algebra.* (Credit not offered for both Math. 10 and Social Science 60 or Psychology 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 Social Science 60 or Psychology 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 include: combinatorial structures, formal languages: permutations, lattice paths . . . ; generating functions: partitions, recurrence relations . . . ; graph theory: tree, chromatic polynomials . . . ; information theory: codes, sorting . . . *Prerequisite: Math. 4C or equivalent.*

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. (Credit not offered for both Math. 74 and CSE 64.) *Prerequisites: Math. 2B and CSE 61 or 65 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. 2C (2CH) and a 3.5 average in two courses in the UCSD Math. 2 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. 2EA (2EH).* (F,S)

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. 2EA (2EH) 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. 2EA (2EH).* (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. 2EA (2EH) 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. 2A-2EA or consent of instructor.* (Not offered in 1993-94.)

110. Introduction to Partial Differential Equations (4)

Fourier series, orthogonal expansions, and eigenvalue problems. Sturm-Liouville theory. Some partial differential equations of mathematical physics. Boundary value problems and separation of variables. Three lectures, one recitation. *Prerequisites: Math. 2DA (2DH) and 2EA (2EH) or consent of instructor.* (F,S)

111A. 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. 2DA (2DH) and 2EA (2EH).* (Not offered in 1993-94.)

111B. 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. 2DA (2DH) and programming ability (any course). (Not offered in 1993-94.)

111C. 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. *Prerequisite:* Math. 111A or 111B. (Not offered in 1993-94.)

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. 2F (2FH). (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. 2DA (2DH) and 2EA (2EH). (F)

130B. Ordinary Differential Equations (4)

Existence and uniqueness of solutions to differential equations. Local and global theorems of continuity and differentiability. Three lectures. *Prerequisites:* Math. 2DA (2DH) and 2EA (2EH), 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. 2DA (2DH) and 2EA (2EH) 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. 2F (2FH) 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. 2F (2FH). 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. 2F (2FH) 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. 2EA (2EH) 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)

Areas of mathematics and their development will be studied. The areas of mathematics to be studied will vary from year to year. Examples are: The evolution of mathematics from the Babylonian period to the eighteenth century using original sources in translation, a history of the foundation of mathematics, the development of modern mathematics. *Prerequisite:* Math. 1C or 2B or consent of instructor. (S)

165. Introduction to Set Theory (4)

Sets, relations, and function. 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. (F,S)

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. 2EA (2EH) 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. 2EA (2EH) 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. 2DA (2DH) and 2EA (2EH) 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. (Credit not offered for both Math. 171A-B and Econ. 172A-B.) *Prerequisites:* Math. 102 or 170A and knowledge of programming. (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

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credit for Math. 174 if Math. 170 A,B, or C has been taken already. *Prerequisites: Math. 2EA (or 2EH) 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. 2F (2FH), 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. 2DA (2DH).* [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. 2F (2FH).* (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 2EA (2EH).* [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. Komogorov-Smirnov statistics, sequential analysis. Three lectures. *Prerequisite: 181A.* (S)

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. 2EA (2EH) 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. 2C (2CH).* (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.*

186A-B. Principles of Algorithm Implementation (4-4)

Methods and tools that make for effective program design developed through case studies of nonnumerical algorithms from sorting, searching, backtracking, and algorithmic graph theory. Includes top down and structured programming, data structures, run time analysis, program correctness, comparative studies of algorithm design. Three lectures. *Prerequisites: Math. 176A, 103A.* (F,W)

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 non-numerical 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)

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. Undergraduate 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)

Vector spaces and linear transformations, eigenvalue problems, tensor algebra, matrices, norms, completeness, the spaces L_p

and C , distributions, delta sequences. Properties of Lebesgue, Stieltjes, line integrals. Analytic functions. *Prerequisites: Math. 2D-E or 3D-E and 140A or advanced calculus.* (F)

210B. Mathematical Methods in Physics and Engineering (4)

Scalar products, orthogonal series in Hilbert space, best approximation. Compact symmetric operators, expansions in eigenvectors. Applications to matrices, quadratic forms, integral equations. Regular and singular Sturm-Liouville problems. Green's functions. *Prerequisite: Math. 210A or consent of instructor.* (W)

210C. Mathematical Methods in Physics and Engineering (4)

Fourier transforms of functions and distributions. Laplace transforms, applications to boundary value problems. Simple second order elliptic, hyperbolic, and parabolic partial differential equations. Uniqueness theorems, maximum principles. Spherical harmonics. Wave propagations. *Prerequisite: Math. 210B or consent of instructor.* (S)

210D. Mathematical Methods in Physics and Engineering (4)

Elements of measure and integration theory, convergence theorems, L_p -spaces, Fubini theorem, Radon-Nikodym theorem. Applications to probability and elements of calculus of variations as time permits. *Prerequisites: Math. 210A and 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.)

230A-B-C. Ordinary Differential Equations (4-4-4)

Existence and uniqueness theorems. Linear systems with constant and periodic coefficients. Sturm-Liouville theory. Eigen-

function expansions. Stability and asymptotic behavior of nonlinear systems. Poincare-Bendixon 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 sub-algebra 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 sieving 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 shellability. 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)
Numerical solution of linear equations, least squares, and eigenvalue problems. Numerical solution of ordinary differential equations. *Prerequisites: Math. 2EA (2EH) and knowledge of FORTRAN.*

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. *Prerequisites: Math. 171A-B or 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. *Prerequisites: Math. 170A, 172, or 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. *Pre-*

requisite: 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 T^2 . 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.

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.)

MIDDLE EAST STUDIES

OFFICE: 8085 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, *Assistant Professor, Anthropology*
Timothy McDaniel, *Professor, Sociology*
Michael E. Meeker, *Professor, Anthropology*
William H. Propp, *Associate Professor, History*
Gershon Shafir, *Associate Professor, Sociology*
Melford E. Spiro, *Professor Emeritus, Anthropology*
Winifred Woodhull, *Assistant 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. 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.

Courses

■ CORE COURSES

- ANRG 162. Peoples of the Near East
 ANRG 189. Zionism
 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 199. Independent Study (Middle East History)
 LTGN 185. Gender and Decolonization in North African and French Literature
 Poli. Sci. 121A-B. Governments and Politics of the Middle East
 Poli. Sci. 121C-D. The Arab-Israeli Conflict
 Soc. 158. Islam in the Modern World
 Soc. 188F. Modern Jewish Societies and Israeli Society
 Soc. 188H. Middle Eastern Societies
 Soc. 189. Special Topics in Comparative-Historical Sociology (Middle East Topics)
 Soc. 199. Independent Study (Middle East Sociology)

■ SUPPORTING COURSES

- ANLD 11. Human Origins (Examples from Near Eastern Archaeology)
 ANGN 100. Prelude to Civilization
 ANGN 101. The Emergence of Civilization
 ANGN 102. Early Urbanism
 ANRG 101. Near Eastern Pre-History
 ANRG 105. Ethnoarchaeology
 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. 148E. Ethnicity and Politics
 Soc. 154. International Social Problems
 Soc. 168. Cultures and Civilizations
 Soc. 182. Revolutions
 Soc. 190. Senior Seminar (Ideological Trends in the Middle East)

MOLECULAR PATHOLOGY

OFFICE: 1012 Basic Science Building, School of Medicine

Associated Faculty:

Professors

- Stephen Baird, M.D., *Pathology*
 Kurt Benirschke, M.D., *Pathology and Reproductive Medicine*
 Colin M. Bloor, M.D., *Pathology, Director*
 Charles E. Davis, M.D., *Pathology*
 Russell F. Doolittle, Ph.D., *Chemistry*
 Richard Dutton, Ph.D., *Biology*
 Marilyn G. Farquhar, M.D., *Pathology*
 James Feramisco, Ph.D., *Medicine*
 Joshua Fierer, M.D., *Medicine and Pathology*
 Martin Haas, Ph.D., *Biology*
 Alan F. Hofmann, M.D., Ph.D., *Medicine*
 John J. Holland, Ph.D., *Biology*
 Martin F. Kagnoff, M.D., *Medicine*
 Michael Karin, Ph.D., *Pharmacology*
 Thomas A. Lane, M.D., *Pathology*
 Katsumi Miyai, M.D., Ph.D., *Pathology*
 Michael N. Oxman, M.D., *Medicine and Pathology*
 Henry C. Powell, M.D., *Pathology*
 Samuel I. Rapaport, M.D., *Medicine and Pathology*

- Ann Rearden, M.D., *Pathology*
 Douglas Richman, M.D., *Pathology and Medicine*
 Michael G. Rosenfeld, Ph.D., *Medicine*
 Deborah H. Spector, Ph.D., *Biology*
 Robert D. Terry, M.D., *Neuroscience and Pathology*
 Gernot Walter, Ph.D., *Pathology*

Associate Professors

- Michael Bevilacqua, M.D., Ph.D., *Pathology*
 Pojen Chen, Ph.D., *Medicine and Pathology*
 Kenneth Chien, M.D., *Medicine*
 Daniel James Donoghue, Ph.D., *Chemistry*
 Thomas J. Kipps, M.D., Ph.D., *Medicine*
 Theo N. Kirkland, M.D., *Pathology and Medicine*
 Michael J. Kelner, M.D., *Pathology*
 Tsunao Saitoh, M.D., *Neurosciences*
 David Schubert, Ph.D., *Salk Institute*
 Bartholomew M. Sefton, Ph.D., *Salk Institute*

Assistant Professors

- Elizabeth Broome, M.D., *Pathology*
 Mark Kamps, Ph.D., *Pathology*
 Jan E. Schnitzer, M.D., *Medicine and 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*
 Erkki Ruoslahti, M.D., *Pathology*
 Bartholomew Sefton, Ph.D., *Pathology*
 Saraswati Sukumar, Ph.D., *Pathology*

Research Series

- Susan Carroll, Ph.D., *Pathology*
 George G. Glenner, M.D., *Pathology*

THE GRADUATE PROGRAM

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. For students with a B.A. in biology, the first qualifying examination will be taken at the end of the fall quarter of the second year. Students holding an M.D. degree take this examination at the end of the spring quarter of the first 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.

TEACHING

All students are encouraged to assist in teaching laboratories in the core histology/pathology course for medical students.

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.

230G. Molecular Biology of the Cell (6)

An integrated consideration of the general principles of molecular pathology. This course will provide the basic foundation of the molecular biology of the cell for graduate students as a prerequisite for Pathology 208G. This course is for graduate students only.

231. Modern Methods in Cellular and Molecular Pathology (4)

This course presents key concepts and methodologies used in cellular and molecular pathology research. Topics will include cell membrane transport, protein purification, recombinant DNA techniques, DNA sequencing, and PCR technology. The relevance of these methods for investigating human disease will be discussed.

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.

MUIR COLLEGE

OFFICE: Provost, Muir College, 2126 Humanities and Social Sciences Building

Courses

199. Muir Special Project (4-16)

A course of independent work on a research or creative project to satisfy a Muir graduation requirement. (Only Muir students who have had Muir Special Project proposals approved may enroll in this course.) Students wishing to enroll must submit a written request with a description of the project. (Muir students must submit the Muir Special Project 199 form to the major adviser and to the Office of the Provost by the seventh week of the quarter prior to the quarter in which the 199 is to be undertaken. For information on other requirements, consult the provost's office.) *Prerequisites: upper-division status, approval by project adviser and by provost.* (Letter grades only.)

THE WRITING PROGRAM

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.

40-50. Critical Writing (4-4)

A sequence in university reading and writing required of all Muir College students who have not completed comparable courses elsewhere. Satisfies the Muir College graduation requirement in writing. MCWP 40 introduces students to the basic elements of argument and analysis. MCWP 50 focuses on advanced skills of argument and analysis. In both courses, students will engage in close reading of texts, weekly writing and revision, and individual conferences. Both courses 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 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.*



OFFICE: 110 Mandeville Center for the Arts

Professors

Robert Erickson, M.A., *Professor Emeritus*
 Peter Farrell, M.M., *Professor Emeritus*
 Brian Ferneyhough, Dip. Mus.
 Edwin Harkins, Ph.D., *Vice Chair*
 Cecil Lytle, B.A.
 F. Richard Moore, Ph.D.
 Thomas Nee, M.A., *Professor Emeritus*
 János Négyesy, Dip. Mus.
 Wilbur Ogdon, Ph.D., *Professor Emeritus*
 Carol Plantamura, M.F.A.
 Roger Reynolds, M.M.
 John Silber, Ph.D., *Professor Emeritus*
 Harvey Sollberger, M.A.
 Bertram Turetzky, M.A.
 Joji Yuasa

Associate Professors

Gerald Balzano, Ph.D.
 John Fonville, D.M.A.
 Philip Larson, M.M.
 Jann Pasler, Ph.D.
 Steven Schick, M.M.
 Rand Steiger, M.F.A., *Chair*

Assistant Professors

Marnie Dilling, Ph.D.
 Aleck Karis, M.M.
 George Lewis, B.A.
 Jane Stevens, Ph.D.

Senior Lecturer

James Cheatham, Dip. Mus., *Emeritus*

Artist in Residence

Celin Romero, Dip. Mus., B.A.

Affiliated Faculty

Kenneth Anderson
 Garrett Bowles, Ph.D.
 David Chase, D.M.A.
 Robert Zelickman

The Department of Music is dedicated to the development of musical intelligence. The goal of its graduate program is to educate researchers

who will extend the musical intelligence of the entire music community; its undergraduate program aims to enhance the musical intelligence of students in their appreciation of the music-making process.

In addition to our regular faculty, the Department of Music regularly invites outstanding composers and performers as visitors. Previous visitors have been John Cage, Toru Takemitsu, Henry Brandt, Joan Tower, Charles Wuorinen, Iannis Xenakis, and Anthony Braxton.

THE UNDERGRADUATE PROGRAM

The special characteristic of the undergraduate program in music at UCSD has been its attempt to coordinate graduate activity with undergraduate studies. By involving undergraduate students whenever possible with faculty and graduate students, undergraduates are offered special opportunities for enlarging their musical abilities and understanding. In particular, the department affords its undergraduates a unique opportunity to gain advanced familiarity with contemporary thinking about and practice of music.

Undergraduate courses offered in the Department of Music satisfy a wide range of student interests for non-music majors as well as for students majoring in music. For students with little background in the study of music, there are three sets of introductory courses: those that lead the student to a personal understanding of the nature of music through various projects in which music is made and performed by the students themselves (Music 5); those that develop basic skills musicians use in the analysis and performance of music (Music 1A-B-C); and those that introduce students to the music heritage of traditional and contemporary cultures (Music 4-14). For students who have more background and who intend to continue in upper-division music theory and practice courses, Music 2A-B-C (instead of 1A-B-C) is essential.

Diverse offerings in music literature courses (numbered 111 through 127) are also available to all UCSD students.

Particular major or minor requirements and course prerequisites may be waived by examination for students with sufficient background in music.

Although careers in music have generally been associated with performance in large ensembles or with teaching in music education programs, there is a growing number of opportunities which relate to more individualized combinations of practical and technical skills. These might include, for example, arts management, recording

and computer-related business, and music publishing. One cannot prepare adequately for most professional roles in music with a bachelor's degree, but a strongly practical, flexible, and broadly conceived training at the undergraduate level is, we believe, the ideal route to the widest range of future possibilities.

FACILITIES**Music Library**

The Central University Library houses an extensive collection of holdings in standard and contemporary music, including an archive of recordings of most Department of Music performances.

Computer Music Instructional Facilities

In addition to facilities for general instruction in electroacoustic music, the department maintains a sophisticated facility for the support of graduate and undergraduate instruction in computer music. The department's Computer Music Instruction Laboratory (CMIL) consists of a network of powerful computer music workstations configured for instructional use by researchers at UCSD and located in the Department of Music. Access to all instructional facilities is limited to students enrolled for credit in specific courses, currently including Music 160A-C, 161, 162, 163A-B-C, 250, or 263A-B-C.

MAJOR PROGRAMS

The Department of Music is committed to active, inventive music making; thus all music majors are encouraged and normally expected to participate in an ensemble performance group each quarter. As a minimum, every major is required to enroll in Music 95, Music 130, or Music 131 ensemble performance for at least six quarters, with three quarters of participation specifically in a reading chorus (Music 95C, 95D, or 95K). (Transfer students will be credited for corresponding activities at other institutions.)

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 are interested in music as one of the fine arts and may wish later to engage in music as a profession; most of the courses in this major involve the student in the performance as well as the analysis of music. This major thus requires extensive development of technical 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. For that

reason, this program is suited for students in Muir, Third, Fifth, and Warren College whose college requirements permit considerable specialization in the lower division; however, Revelle College students with training in music prior to entrance at UCSD may also pursue this program.

The **music/humanities program** is intended for students who are interested in music as one of the liberal arts and wish to gain extensive knowledge and appreciation of music that will enable them to form part of an understanding, sophisticated musical public. Because it does not require training in music prior to entrance into UCSD nor extensive, time-consuming training in musicianship skills, it fits the special need of students in Revelle College, although it is open also to students in Muir College, Third College, Fifth College, and Warren College who do not plan to pursue a career in music or to undertake graduate studies.

A new major in music with emphasis in computing and the arts is currently being developed. If you are interested, please inquire in the music department.

All courses to be counted toward satisfying major requirements in music must be passed with a grade of C or better.

While special studies courses (Music 194, 198, 199) are made available to music students, they are generally not allowed as substitutes for required courses.

A minimum residency of one year is required of all music majors; however, most students take at least two years to complete requirements after transferring to UCSD.

Pre-Music Major Requirements

To qualify for the music major, Music 2C and Music 2CK (Basic Keyboard) must be passed with a grade of A or B.

THE MUSIC MAJOR PROGRAM

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, except Music 2C and Music 2CK (Basic Keyboard), which must be passed with a grade of A or B.

Transfer students must pass a proficiency test for Music 2C and Music 2CK (Basic Keyboard) with a grade of A or B.

The lower-division requirements for this major are Music 5, Music 2A-B-C, and Music 2AK-BK-CK. For students in this program Music 5 and 2A, B, or C may be taken concurrently. To complete the major requirements the following courses are required:

1. Music 101A-B-C.
2. Music 102A-B-C.
3. Music 120 A-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*), Music 160A-B-C (*music science and technology*), three quarters of Music 132 (*performance*), or three additional courses from the series Music 111-127 (*literature*).
7. Six quarters of Music 95, 130, or 131 (three from 95C, 95D, or 95K).
8. Music 143 every quarter.

HONORS

The requirements for a B.A. degree with honors in music are the same as the music major program, but with specification that twelve additional unit-credits be taken in courses in the area of emphasis: advanced performance (specifically in Music 132R), advanced composition (specifically in Music 103D-E-F), advanced music science and technology (Music 163A-B-C and/or 199), or advanced music literature (Music 111-127 and/or 199). To be admitted to the honors program, a student must pass an audition before a jury of faculty members from the department; to graduate with honors the student must give a public presentation of the results of the honors study. In accordance with university regulations, however, only 20 percent of students graduating in any academic year, who fulfill departmental requirements will be granted departmental honors. Faculty will review honors candidates in the spring quarter only.

THE MUSIC/HUMANITIES MAJOR PROGRAM

The lower-division requirements for this major are a total of two courses: Music 1A and 5. In addition, twelve upper-division courses are required to satisfy the major requirements, of which six must be music literature courses (Music 120A-B-C and three other courses selected from Music 111 through 127); the other six must form a coherent set of humanities or fine arts upper-division courses relevant to a music major. For example, the six related courses might all be in art history, or they might be courses distributed over several departments (e.g., history, literature, and visual arts), all dealing with the baroque period in the arts. Advance approval of these six related courses must be secured in writing from the departmental music-humanities major adviser. To complete this major, six quarters of participation in ensemble performance—

through enrollment in Music 95, 130, or 131—is required. Continuous enrollment in Music 143 (department seminar) is also required. All music/humanities majors must submit, in writing, a course proposal to their music faculty adviser at the beginning of their junior year.

TRANSFER STUDENTS

Students who plan to transfer into the Department of Music 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.

To verify the acceptability of transfer courses, students should make an appointment with a Department of Music adviser. A degree check will be done and results placed in the student's file. All transfer students must pass a proficiency examination in Music 2C (Basic Musicianship) and Music 2CK (Basic Keyboard) with a grade of A or B. They should also plan to provide transcripts and syllabi for any music history, literature, performance, composition, or technology courses taken elsewhere that they wish to have counted.

MINOR PROGRAMS

Students must seek advice and obtain approval from a departmental adviser prior to embarking upon a minor program. Please obtain a Department of Music brochure of approved minors from the department office. To satisfy the noncontiguous minor requirements for Revelle College or the optional minor requirements for Fifth, Muir or Third College, a student may take twenty-four quarter-units in music courses with a grade of C or better, of which twelve quarter-units must be in upper-division courses. To satisfy one of the two required Warren College programs of concentration for the B.A. degree, a student may take twenty-four quarter-units in music courses with a grade of C (or P) or better; of these a sufficient number must be earned in upper-division courses to bring the total number of upper-division quarter-units in the two programs of concentration to twenty-four. In lieu of programs of concentration, Warren College B.S. in engineering majors may select one of two required three-course area studies from a special list of options in humanities and fine arts. (One of the three courses must be upper-division.)

ADVISING OFFICES

Music	Professor Stevens, 119
Humanities	Mandeville Center, 534-6754
Fifth	Professor Larson, B-138 Mandeville Center, 534-6650

Muir	Professor Balzano, B-127 Mandeville Center, 534-2087
Revelle	Professor Plantamura, 110 Mandeville Center, 534-3230
Third	Professor Lewis, B-127 Mandeville Center, 534-6293
Warren	Professor Karis, 2146 Warren Lecture Hall, 534-8876
M.A.	Professor Fonville, 2144 Warren Lecture Hall, 534-4712
Ph.D.	Professor Stevens, 119 Mandeville Center, 534-6754

Staff Contacts:

Undergraduate:

Stephanie Ferneyhough, 124
Mandeville Center, 534-8226

Graduate:

Judy H. Payne, 109 Mandeville Center,
534-3279

THE GRADUATE PROGRAM

The department offers programs leading to the degree of master of arts in music and the degree of doctor of philosophy in music.

Normally, students will be admitted to begin graduate studies in the fall quarter only; applications should be submitted by January 15 of the admission year. Failure to meet that deadline will jeopardize the applicant's opportunity for admission and financial support. Applicants to graduate studies in music must submit, as part of the application, the following:

1. Tapes demonstrating their level of vocal and/or instrumental performance. It is expected that applicants will be acceptably proficient in at least one area of performance. (For composition applicants, a tape of performance skills is optional.)
2. A repertory list of works performed during the past year and a sample of printed concert programs in which they have participated.
3. For composition applicants, a minimum of two scores of instrumental works with taped examples of the works being performed. (These may be of electronic compositions, if desired.)
4. A minimum of two papers illustrating writing ability in any one of the following areas: analysis, criticism, aesthetics, or music technology.
5. Scores attained on the Graduate Record Examination—including the Aptitude Test and the Advanced Test in Music—given by the Educational Testing Service of Princeton, New Jersey. Foreign students must also submit TOEFL scores.
6. Official transcripts.

After completion of an **advisory examination**, 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 and error recognition, style recognition, guided composition, analysis, sight reading, keyboard proficiency, history and literature, technology) will be expected to remedy deficiencies during their first year and will be re-tested at the end of that first year. **Students will not be advanced to candidacy until all deficiencies are remedied.** The appropriate departmental adviser or the student's individual adviser must approve student course programs each quarter prior to registration for classes, as well as any significant change in those programs.

To assure that all requirements are being adequately met, all graduate students must make an appointment with the curriculum coordinator for a degree check periodically, and at least no later than during the winter quarter of the second year.

MASTER'S DEGREE PROGRAM

The department offers work leading to a master of arts in music with emphasis on *composition*, *performance*, *computer music*, or *theoretical-experimental studies*. The degree requires admission to the graduate program and completion of at least thirty-six quarter-units of graduate courses (courses numbered 201-299), including six units of Music 299 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

Since the department at all levels encourages the actual making of new music, all master's candidates are required to share in this activity by enrolling in **Music 201**, Projects in New Music Performance, for both years of their residence at UCSD. (Performers must take 201 laboratory 1, Twentieth-Century Ensemble, every quarter offered and are expected to enroll in a performance project as part of winter quarter Music 250; non-performers are expected to participate in a performance project as part of Music 250 or enroll in Music 201C, as well as take Music 228, Conducting.) In addition, all graduate students are expected to attend regularly the departmental colloquia and concerts aimed at extending and sharing their musical experience, and they are encouraged to use these as opportunities to present their own work, their research, and their creative interests.

Because of the importance of technology in present-day music, all graduate students must become familiar with and capable of handling the appropriate technological facilities of the department; to that end, graduate students wishing to use electronic studios or take Music 263 are re-

quired to pass an examination in the modern technology of music by the end of their first quarter at UCSD or to enroll in Music 160A, 161, 162. In addition, all M.A. students are required to take Music 210, Musical Analysis, and Music 291, Problems and Methods of Music Research and Performance. To complete their emphasis requirements, students concentrating on *composition* in their M.A. programs must take the composition seminar sequence Music 203A-B-C and two courses in theoretical or experimental studies. At the end of the fall and spring quarters, juries are held at which the student's current compositions are heard. If the level of work is deemed unacceptable by the assembled composition faculty, the student may not continue with individual study under 203D or pursue a thesis with compositional emphasis. Such students will pursue their degree work in another emphasis. Students emphasizing *performance* must take the performance sequence 232 (a minimum of four quarters) and *two* courses in music literature or performance practices chosen from Music 211-224.

Students who wish to emphasize *theoretical-experimental studies* or *computer music* in their M.A. programs must demonstrate proficiency in either composition or performance by satisfactorily (grade of B or better) completing, in their first year, either the composition seminar sequence Music 203A-B-C or the performance sequence 232A-B-C. In the second year, students emphasizing *theoretical-experimental studies* must take two courses in theoretical studies (207s), and one course in experimental studies (206s); students emphasizing *computer music* must take a total of four quarters of 263 (Advanced Music Technology Seminar) in computer-related areas, plus one quarter of theoretical or experimental studies (206 or 207).

To supplement their course programs (*a full-time graduate student is required to carry a minimum of twelve units per quarter*), the student may choose among a variety of graduate or upper-division courses in music or related courses in other departments, as approved by the student's adviser. If the student's research area calls for reading proficiency in one or more foreign languages, the student's master's thesis committee will require that the student present evidence of proficiency. In order to be able to certify that its graduates are competent teachers of music, the department requires that a master's candidate serve as an apprentice teacher under the supervision of a member of the faculty; this requirement is satisfied by earning a total of six units of credit in Music 500. If a funded teaching assistant appointment is not available, it is the student's responsibility to find and propose an ap-

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appropriate way of fulfilling this requirement. All graduate students must enroll in the department seminar, Music 143, every fall and spring quarter.

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.

THE M.A. PROGRAM

FALL	WINTER	SPRING
COMPOSITION EMPHASIS		
<i>First Year</i>		
203A	203B	203C
291		228
210		
*Other	*Other	*Other
<i>Second Year</i>		
203D	299	299
206/207	206/207	
*Other	*Other	*Other
PERFORMANCE EMPHASIS		
<i>First Year</i>		
232	232	232
291		
201A		201C
210		
*Other	*Other	*Other
<i>Second Year</i>		
232D	299	299
Lit./Perf. (211-224)	Lit./Perf. (211-224)	
201A		201C
*Other	*Other	*Other
THEORETICAL-EXPERIMENTAL STUDIES EMPHASIS		
<i>First Year</i>		
203A/232A	203B/232B	203C/232C
206		
210		228
291		
*Other	*Other	*Other
<i>Second Year</i>		
	299	299
207	207	
*Other	*Other	*Other
COMPUTER MUSIC EMPHASIS		
<i>First Year</i>		
263	263	263
210		228
203A/232A+	203B/232B+	203C/232C+
291		
*Other	*Other	*Other
<i>Second Year</i>		
263	299	299
206	207	
*Other	*Other	*Other

+Students emphasizing computer music must take either the 203 composition seminars or the 232 performance sequence in their first year, and either 206 (Experimental Studies) or 207 (Theoretical Studies) during the second year.

*Other courses and activities will include electives, Music 500, Music 143, departmental colloquia, and concerts.

MASTER'S THESIS

M.A. candidates will present a thesis consisting of the following under the supervision of the student's graduate adviser 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 *performance* will present a lecture-recital lasting an hour—the program to be approved by the departmental master's degree adviser.
3. Candidates emphasizing *theoretical-experimental studies* will write an extended research paper (thesis) on a topic chosen with their adviser.
4. 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.

The specific nature of the thesis to be undertaken—including the types of compositions in the folio for composition emphasis, the program of the lecture-recital for performance emphasis, the topic of the extended research paper for theoretical-experimental studies emphasis, and the nature of the computer music project—must be approved in advance by the student's master's thesis committee, typically in the student's fourth quarter in residence. The entire thesis must be approved by that committee upon completion.

DOCTORAL DEGREE PROGRAM

Students of superior musical competence may pursue a program with emphasis in *composition* or in *theoretical-experimental studies* leading to the Ph.D. in music, under the general requirements for the doctor of philosophy degree as described in the section "Graduate Studies" of this catalog. Emphasis in *composition* or in *theoretical-experimental studies* is not necessarily incompatible with significant stress on performance or computers. The specific departmental requirements for the degree are:

1. Admission to the graduate program and successful completion of an M.A. degree, including requirements equivalent to those described above for the M.A. in music. (Students with graduate degrees or courses from other institutions will be appropriately credited. Music 160A and Music 210 must be taken in the first quarter of the Ph.D. program and Music 291 in the second quarter if proficiency cannot be demonstrated. Music 201A-B-C and 228 must also be taken as described in the typical Ph.D. program [see below]

if the student has not participated in UCSD's master's degree program.) The Department of Music strongly recommends that entering doctoral students have acquired a reading knowledge of at least one foreign language. UCSD M.A. students who apply to the Ph.D. program must complete all departmental requirements, obtain OGSR approval, and file the M.A. degree at CUL before enrolling in Ph.D.-level seminars or courses.

2. A minimum of six doctoral-level seminars beyond the M.A. to be approved in consultation with the student's committee. Ph.D. students are expected to take three 209-level seminars during their first two years, and these three courses, in addition to three chosen from the 206/207 offerings, will be counted towards the required six. (Please see following "Typical Programs for the Ph.D." for additional basic required course work.)

3. a. One research paper judged to be of publishable quality *to be completed prior to qualifying examinations*.

N.B. 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. The student and his or her committee chair should discuss the paper topic and a date for presentation of the first draft to be due some time during spring (sixth) quarter of the student's second year. At that point the paper will be reviewed by the student's entire committee. A final version of the paper will be presented to the committee chair before the last day of fall quarter (seventh quarter) of the student's third year.

If the paper is acceptable, a date for the qualifying exam will be set for the following spring quarter (ninth quarter); if not, the student has one and one-half quarters to make the necessary improvements.

b. For students taking a *composition* emphasis, an additional folio of not fewer than three compositions (not previously accepted for an M.A. degree) *to be completed prior to qualifying examinations*.

N.B. Composition students must take the 203A-B-C seminar series as well as 203D, individual study, with a member of the composition faculty.

4. The Department of Music strongly recommends that entering graduate students have acquired knowledge of at least one foreign language.

5. Demonstration through written and oral examinations of a comprehensive understanding of literature and theory of the field.

N.B. All required course work as well as the publishable paper must be completed previous to qualifying (written and oral examination) for the Ph.D. degree.

6. An acceptable dissertation (*theoretical-experimental studies*) or a major composition project (*composition*).

7. A final public defense of the dissertation/composition (twelfth quarter).

8. Six units of credit in Music 500, Apprentice Teaching (unless the student has completed this requirement in UCSD's master's degree program).

9. Music 143 every fall and spring quarter until qualifying exams are passed.

Materials previously submitted for other degrees are not acceptable for submission for the Ph.D. degree.

The required courses beyond the requirements for the M.A. are assigned by the student's doctoral adviser after review of the student's academic background and abilities, as confirmed by appropriate departmental testing. However, the student should not expect these courses alone to prepare him or her for doctoral examinations. The student is expected to choose other electives in music and electives in other disciplines, such as history, literature, art history, philosophy, and physics when useful. The student will also undertake independent studies, supervised by an appropriate member of the faculty, and prepare himself or herself in the library and laboratory for qualifying examinations.

In addition, the doctoral student is expected to continue participation in departmental colloquia and music-making activities.

TIME LIMIT POLICY FOR THE DOCTORAL DEGREE

The normative time for the Ph.D. in music is four years (with previous master's degree), six years (without previous master's degree). Educational fee grants are provided to students within normative time after advancement to Ph.D. candidacy and until accrued time in graduate status exceeds the normative time.

Maximum Time Limits in the Ph.D. Program: maximum four years precandidacy, maximum six years financial support, maximum total registered time six years in the Ph.D. 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.*

N.B. A total of *six quarters only* will be counted as M.A. time. Quarters beyond six are counted toward total registered time to the Ph.D. degree for those students admitted to the doctoral program.

TYPICAL PROGRAM FOR THE PH.D. IN MUSIC FIRST AND SECOND YEARS

FALL	WINTER	SPRING
COMPOSITION		
<i>First Year</i>		
203A(Ph.D.) (210) (291)	203B(Ph.D.)	203C(Ph.D.) (228)
209—four or more required for the Ph.D. degree		
*Other	*Other	*Other
<i>Second Year</i>		
203D	299	299
206/207—four or more required for the Ph.D. degree		
209		
*Other	*Other	*Other
THEORETICAL-EXPERIMENTAL STUDIES		
<i>First Year</i>		
+232/203/263 (201A) (210) (291)	+232/203/263	+232/203/263 (201C) (228)
209—three or more required for the Ph.D. degree		
*Other	*Other	*Other
<i>Second Year</i>		
206 (232)	299	299
++(206/207—three or more required for the Ph.D. degree)		
*Other	*Other	*Other
*Other courses and activities include electives, Music 500, Music 143, departmental colloquia, and concerts.		
+Students emphasizing performance should take the 232 sequence; those emphasizing composition should take the 203 sequence; and those with computer music emphasis should take three quarters of 263 in computer-related topics.		
++Doctoral students emphasizing computer music may replace one 206/207 requirement with three 263s or two 206/207's with four 263s.		

First and Second Years

(see charts above)

Six approved seminars and a publishable paper (plus 201A-B-C, 210, 228, and 291 if required)**

Additional courses for breadth

Six units of Music 500 (if not already completed)

Music 143 every fall and spring quarter

Third and Fourth Years

Written and oral qualifying examination

Dissertation writing

Dissertation defense

**cf., above under 1.

Courses

NOTE: These 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. *Prerequisites: 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. Music majors must be concurrently enrolled in Music 2AK, 2BK, and 2CK (Basic Keyboard). *Prerequisite: passing score on placement exam. Must be taken in sequence.*

2AK-BK-CK. Basic Keyboard (2-2-2)

Scales, chords, harmonic progressions, transposition, and simple pieces. For music majors, to be taken concurrently with Music 2A-B-C. *Prerequisite: concurrent enrollment in 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. *Prerequisites: 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. *Prerequisites: 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. *Prerequisites: 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. *Prerequisites: none.*

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.). *Prerequisites: none.*

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.). *Prerequisites: none.*

11. Folk and Popular Music (4)

A course on folk and popular musics of the world, all geographic regions. Folk and/or popular music will be covered.

MUSIC

through lectures, films, and listening sessions devoted to detailed discussion of music indigenous to varying countries/areas of the world. *Prerequisites: 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. *Prerequisites: none.*

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. *Prerequisites: 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. *Prerequisites: 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. *Prerequisites: 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. *Prerequisites: 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 classes. *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.*

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.*

Section A. Symphony Orchestra

Section B. Instrument Choir

Section C. Concert Choir

Section D. Symphonic Chorus

Section E. Chamber Orchestra

Section F. Collegium Musicum

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

Section N. Non-Western Music

* Music 95G Gospel Choir may be taken for three units by consent of instructor only by students participating in extra concert activities.

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. *Prerequisite: Music 2C and 2KC, with grade of A or B. Department stamp required.*

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-D-E-F. Seminar in Composition (4-4-4-4-4-4)

Individual projects in composition critically reviewed in seminar with fellow student and faculty composers. *Prerequisites: Music 2A-B-C; Grade of A or B in 103C to go on to 103D. Department stamp required.*

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. *Prerequisites: none.*

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. Studies in Vocal and Choral Literature (4)

A critical study of representative works for solo voice (with piano or other accompaniment) and/or for choral ensemble. Music majors are assigned additional projects. *Prerequisites: none. Music 4 or 120 recommended, or consent of instructor. (Not offered every year.)*

113. Studies in Opera (4)

A critical study of representative operas. At least one opera discussed will be selected because of the opportunity to see it in staged performance. Music majors are assigned additional projects. *Prerequisites: none. Music 4, 7, or 120 recommended, or consent of instructor. (Not offered in 1991-92.)*

114. Music of the Twentieth Century (4)

An exploration of materials and methods used in the music of our time. There will be an extra discussion group for music majors. May be repeated once for credit. *Prerequisites: none. Music 5 recommended, or consent of instructor.*

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.*

116. Medieval and Early Renaissance Music (4)

The development of an operational and intellectual account of medieval and early Renaissance music. Music majors are assigned additional projects. *Prerequisites: none. Music 4, 7, or 120 recommended, or consent of instructor.*

117. Late Renaissance and Early Baroque Music (4)

Functional performance problems and realizations of music of the sixteenth and seventeenth centuries. Music majors are assigned additional projects. *Prerequisites: none. Music 4, 7, or 120 recommended.*

118. Music of the Classic Era (4)

Main emphasis will be placed on the music of Haydn, Mozart, and Beethoven and general culture of the period. Listening assignments shall be two to four hours with scores. Lectures shall include analysis of specific works together with presentation of interesting topics based on melody, harmony, counterpoint, and rhythm of the period. *Prerequisites: none. Music 4, 7, or 120 recommended.*

119. Music of the Nineteenth Century (4)

A critical study of European Art Music produced during the romantic period. Stress will be placed on the rise of nationalism and its effects upon the music. *Prerequisites: none. Music 4, 7, or 120 recommended.*

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: None. Music 1C or 2C and theory background strongly recommended.*

122. 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. *Prerequisites: none. (Not offered every year.)*

123. The Orchestra and Its Literature (4)

A study of the instruments of the orchestra: their resources, tonal effects, their use by major composers, methods of writing for modern instruments, analysis of representative scores. Music majors are assigned additional projects. *Prerequisites: Music 4, 7, or 120 recommended, or consent of instructor.*

124. Studies in Chamber Music (4)

A critical study of representative works for small ensemble. The literature studied is selected and may vary from course to course. Music majors are assigned additional projects. *Prerequisites: Music 4, 7, or 120 recommended, or 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 Black Americans (4-4)

The first quarter of this course will investigate the vocal music of black 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. *Prerequisites: none.*

128. Principles and Practice of Conducting (4)

The theory and practice of instrumental and/or choral conducting as they have to do with basic baton techniques, score reading, interpretation, orchestration, program building, and functional analysis. Members of the class will be expected to demonstrate their knowledge in the conducting of a small ensemble performing literature from the eighteenth, nineteenth, and twentieth centuries. *Prerequisites: Music 2A-B-C and 101A-B-C. Department stamp required.*

129. Orchestration (4)

This course will give practical experience in orchestration. Students will study works from various eras of instrumental music and will demonstrate their knowledge by orchestrating works in the styles of these various eras, learning the capabilities, timbre, and articulation of all the instruments in the orchestra. *Prerequisite: Music 101B.*

130. Advanced Chamber Music Performance (2-4/0)

Advanced 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 0 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 0 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 24 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 and a committee of two additional music faculty. Special audition required during Welcome Week preceding fall quarter. *Prerequisites: by audition only; Music 132.*

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 perfor-

mance. *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.*

198. Directed Group Study (1-4)

Concentrated inquiry into various problems not covered in the usual undergraduate courses. *Prerequisite: 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. Pass/No Pass grade only. May be taken for credit two times. Department stamp required.*

GRADUATE

N.B. 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 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)

Individual studies in composition with a member of the composition faculty. Offered only as demand and faculty availability justifies.

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. (Not offered every year.)

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. (Not offered every year.)*

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.

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.*

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. (Not offered every year.)*

NEUROSCIENCES

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. (Not offered every year.)

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. (Not offered every year.)

224. Seminar Studies in Chamber Literature (4)

A critical and historical study of selected works and repertory. (Not offered every year.)

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 non-performance graduate students. *Prerequisite: consent of instructor.*

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.*

230. Advanced Seminar in Performance of Music for Small Ensemble (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.* (Not offered every year.)

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.* (Not offered every year.)

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.

263A-B-C. 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 plus 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 edi-

tions, and examination of performance practice problems. (S/U grades 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 (a total of six units is required).

NEUROSCIENCES

OFFICE: 3036 Basic Science Building, School of Medicine

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*
 Nelson Butters, Ph.D., *Psychiatry*
 Eric Courchesne, Ph.D., *Neurosciences*
 J. Anthony Deutsch, Ph.D., *Psychology*
 Mark H. Ellisman, Ph.D., *Neurosciences*
 Eva Engval, Ph.D., *Adjunct/Neurosciences*
 John W. Evans, Ph.D., *Mathematics*
 Edmund J. Fantino, Ph.D., *Psychology*
 Fred H. Gage, Ph.D., *Group Chair and Director/Neurosciences*
 Robert Galambos, M.D., Ph.D., *Emeritus/Neurosciences*
 Mark A. Geyer, M.D., *Psychiatry*
 J. Christian Gillin, M.D., *Psychiatry*
 Charles Gray, Ph.D., *Adjunct/Neurosciences*
 Philip M. Groves, Ph.D., *Psychiatry*
 Walter F. Heiligenberg, Ph.D., *Behavioral Physiology*
 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*
 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*
 Arnold L. Miller, Ph.D., *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*
 James W. Patrick, Ph.D., *Adjunct/Neurosciences*
 Stuart Patton, Ph.D., *Adjunct/Neurosciences*
 Henry C. Powell, M.D., *In Residence/Psychiatry*
 Morton Printz, Ph.D., *Pharmacology*
 Vilayanur S. Ramachandran, M.D., *Psychology*
 Michael G. Rosenfeld, M.D., *Medicine*
 David S. Segal, Ph.D., *Psychiatry*
 Terrence J. Sejnowski, Ph.D., *Biology and Physics*
 Allen I. Selverston, Ph.D., *Biology*
 Nicholas C. Spitzer, Ph.D., *Biology*
 Charles E. Spooner, Ph.D., *Neurosciences*
 Larry R. Squire, Ph.D., *In Residence/Psychiatry*
 Charles Stevens, M.D., Ph.D., *Adjunct/Neurosciences*
 Palmer W. Taylor, Ph.D., *Pharmacology*
 Robert D. Terry, M.D., *Neurosciences and Pathology*
 Leon Thal, M.D., *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*
 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., *Neurosciences*

Associate Professors

David G. Amaral, Ph.D., *Adjunct/Neurosciences*
 Karen Britton, M.D., Ph.D., *Psychiatry*
 Stephen L. Foote, Ph.D., *In Residence/Psychiatry*
 Donna Gruol, Ph.D., *Adjunct/Neurosciences*
 Richard Haas, M.D., *Neurosciences and Pediatrics*
 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/Neurosciences*

Pamela Mellon, Ph.D., *Neurosciences*
 Robert R. Myers, Ph.D., *Anesthesiology*
 Helen J. Neville, Ph.D., *Adjunct/Neurosciences*
 Daniel T. O'Connor, M.D., *In-Residence/Medicine*
 Dennis O'Leary, Ph.D., *Adjunct/Neurosciences*
 Tsunao Saitoh, Ph.D., *Neurosciences*
 Mark C. Whitehead, Ph.D., *Surgery*
 Stuart Zola-Morgan, Ph.D., *In-Residence/
 Psychiatry*
 Charles Zuker, Ph.D., *Biology*

Assistant Professors

Thomas Albright, Ph.D., *Adjunct/Neurosciences*
 Gordon Baylis, Ph.D., *Psychology*
 Richard L. Hauger, M.D., *Psychiatry*
 Christine Holt, Ph.D., *Biology*
 John Kelsoe, M.D., *Psychiatry*
 Christopher Kintner, Ph.D., *Adjunct/
 Neurosciences*
 Greg Lemke, Ph.D., *Adjunct/Neurosciences*
 Eliezer Masliah, M.D., *In-Residence/Neuroscience*
 Mark Montminy, Ph.D., *Adjunct/Neurosciences*
 Barbara Ranscht, Ph.D., *Adjunct/Neurosciences*
 Dennis D. Rasmussen, Ph.D., *Reproductive
 Medicine*
 Veronica Roberts, Ph.D., *Reproductive Medicine*
 Martin I. Sereno, Ph.D., *Cognitive Science*
 Clifford Shults, M.D., *Neurosciences*
 Linda Sorkin, Ph.D., *In-Residence/Anesthesiology*
 Neal Swerdlow, M.D., *Ph.D. In-Residence/
 Psychology*
 Matthew Weinger, M.D., *Anesthesiology*

THE GRADUATE 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 campus-wide 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 at least four of the following areas of neurosciences designated as "core": neuroanatomy (Neurosci. 256/257), 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, and students frequently demonstrate minimal competence in an area by enrolling in the appropriate course and passing its final examination. Students are permitted to substitute an area of neurosciences not currently designated a core area for competency; e.g., neuroendocrinology. Such a substitution would require approval by the 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 beginning of the winter 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 four 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)

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: undergraduate or graduate course in neurobiology.* (S/U grades permitted.) (W)

275. Advanced Topics in Neuroscience (2)

Specialized advanced topic areas in neuroscience 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 Clerkship (7)

Provides opportunities for practical application of neurological skills to the understanding and treatment of a variety of clinical disorders of the nervous system. *Prerequisite: successful completion of first two years of medical school.* (F,W,S)

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: 3108 Galbraith Hall, Revelle College

Professors

Henry E. Allison, Ph.D.
 Georgios H. Anagnostopoulos, Ph.D.
 Richard J. Arneson, Ph.D., *Chair*
 Paul M. Churchland, Ph.D.
 Patricia Smith Churchland, B.Phil.
 Gerald D. Doppelt, Ph.D.
 S. Nicholas Jolley, Ph.D.
 Patricia W. Kitcher, Ph.D.
 Philip S. Kitcher, Ph.D.
 Edward N. Lee, Ph.D.
 Stanley W. Moore, Ph.D., *Professor Emeritus*
 Frederick A. Olafson, Ph.D., *Professor Emeritus*
 Robert B. Pippin, Ph.D.
 Avrum Stroll, Ph.D., *Professor Emeritus*
 Zeno Vendler, Ph.D., *Professor Emeritus*

Assistant Professors

Adrian Cussins, D.Phil.
 Sandra D. Mitchell, Ph.D.
 Gila Sher, Ph.D.
 Steven Yalowitz, Ph.D.

Adjunct Professor

S.-Y. Kuroda, Ph.D.

INTRODUCTION TO THE DEPARTMENT

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 courses, of which twelve or more must be from the upper division (courses numbered 100 and above).

ENTRY-LEVEL COURSES

To maximize student options, the department offers a wide variety of lower-division courses and entry-level sequences, with no specific courses or sequences being required. The student's introduction to philosophy can thus be interest-driven. For example, any combination of three courses numbered in the 1-99 range will provide an adequate grounding for entry into most upper-division courses (although see the specific prerequisites cited for some upper-division courses).

AREA REQUIREMENTS FOR THE MAJOR

1. History of Philosophy Requirement: The department requires all of its majors to complete three history courses, one in each of the following areas:

- a. ancient philosophy,
- b. early modern philosophy,
- c. late modern philosophy.

This requirement can be met early, by taking the lower-division 31, 32, 33 sequence, or it can be met later, by taking three appropriate courses from the 101-107 group, or by some suitable combination of these alternatives.

2. Logic Requirement: Philosophy 110 is required of all majors. Note that Philosophy 110 has Philosophy 10 (or an equivalent course from another department or institution) as a prerequisite. Since Philosophy 110 is a prerequisite in turn for a variety of upper-division courses, prospective majors are strongly advised to take Philosophy 10 fairly early.

3. Concentration Requirement: In order to encourage each major to explore at least two areas of philosophy in some depth, the department requires that each major assemble two three-course sequences within the upper division, chosen from two of the following general areas. The two areas of specialization, and the three courses taken within each, are chosen at the student's discretion.

- a. history of philosophy
- b. ethics, social/political philosophy
- c. philosophy of language, logic
- d. metaphysics, philosophy of mind/psychology
- e. epistemology, philosophy of science
- f. continental philosophy

Finally, up to two upper-division courses *outside* of philosophy can count among the twelve required for a major if they are drawn from a closely adjacent field and are relevant to the student's concentration areas. Such credit must be approved by the undergraduate adviser.

Special and independent studies courses (including courses numbered 199) may not be used to satisfy major requirements. Major requirements may be met by examination.

GRADE RULES FOR MAJORS/MINORS

It is required that a passing grade and an overall average of 2.0 must be obtained in courses taken at UCSD fulfilling the major requirements before certification of completion will be granted. Students must attain a grade of C— or better for any course to be counted toward completion of major/minor requirements.

It should be noted that a grade of pass does not count toward fulfillment of departmental requirements for either the major or the minor.

HONORS PROGRAM

The Department of Philosophy offers an Honors Program for outstanding students in the major. Candidates 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. Students interested in participating in the Honors Program should consult with a faculty sponsor before April 15 of their junior year. Admission to the program requires nomination by the sponsor and approval of the department faculty.

In addition to the usual major requirements for graduation, an honors student is required to present a senior honors thesis at the end of winter quarter. During the fall and winter quarters, the student will engage in thesis research (Philosophy 196A and 196B), supervised jointly by the faculty sponsor and the undergraduate adviser. The award of "Philosophy Honors" is based upon the successful completion of Philosophy 196A, 196B, and the senior honors thesis. Honors students are expected to maintain an average of 3.7 or better for all work taken in the program.

**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**

With the exception of Warren College, minor requirements are satisfied by any six courses, at least three of which must be upper-division. Warren College offers its own minor programs in philosophy. A list of possible Warren minor programs in philosophy can be obtained from the college office. With the approval of the undergraduate adviser, courses may be substituted for those included in the Warren programs.

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 3108 Galbraith Hall, (619) 534-3070. Prior to enrolling, students may wish to stop by the department and pick up a copy of the Course Offerings brochure prepared every quarter. The brochure contains course descriptions written by each instructor as well as brief statements by our teaching faculty concerning their background and interests.

**GRADUATE PROGRAM
REQUIREMENTS**

The department offers programs leading to the M.A. and Ph.D. It is the intention of the graduate program to enable the student to obtain an understanding of 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.

MASTER'S DEGREE PROGRAM

To qualify for a master's degree in philosophy, a student must pass eight of the distribution requirement seminars as described below, under the subheading "Distribution Requirements." At least one of the seminars must be from the ethic/

social-political category, and no more than four from either of the other two areas may count towards 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.

DOCTORAL DEGREE PROGRAM

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 101-199), 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 take an examination designed to demonstrate their level of proficiency in formal logic. The examination covers the predicate calculus, up to and including functions, relations, and identity. Students who pass the examination with a grade of B+ or better have satisfied the first component of the logic requirement. Students who do not score a B+ or better must take Philosophy 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.

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 REQUIREMENT

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.")

For information regarding the graduate program, write to: University of California, San Diego; Graduate Adviser; Philosophy, 0302; 9500 Gilman Drive; La Jolla, CA 92093-0302. 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

The Department of Philosophy cooperates in the teaching and administration of the humanities sequence for Revelle College students. (See "Interdisciplinary Courses: Humanities.")

1. The Nature of Philosophy (4)

What is philosophy? A study of some of the major questions with which philosophers deal, through the reading and analysis of classical and contemporary works, and with an emphasis on the way philosophy grows out of questions that in one way or another arise for almost everyone in ordinary life situations.

10. Introduction to Logic (4)

An introduction to critical thinking and to the nature of argument, inference, and proof. How to recognize and defend

PHILOSOPHY

against the most common forms of argumentative fallacy. How to use some of the basic techniques of modern symbolic logic: the propositional calculus. (May be used for the Warren College formal skills requirement.)

12. Logic and Decision Making (4)

An introduction to the study of probability, inductive logic, and scientific reasoning. How to make rational choices between competing hypotheses and alternative courses of action when the relevant evidence is incomplete or uncertain. (May be used for the Warren College formal skills requirement.)

13. Introduction to Philosophy: Ethics (4)

An inquiry into the nature of morality and its role in personal and social life. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

14. Introduction to Philosophy: Metaphysics (4)

An introduction to metaphysical thought, especially as it relates to topics such as freedom, mind, and God. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

15. Introduction to Philosophy: Theory of Knowledge (4)

A study of the scope and nature of human knowledge in both its everyday and scientific forms. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

21. Introduction to the History of Science (4)

This course examines the dramatic development of mankind's conception of the universe from the early Greek scientists through the modern period to Einstein. Emphasis will be on advances in cosmology, astronomy, dynamics, matter theory, mathematics, and biology.

22. Introduction to the Philosophy of Science (4)

An examination of recent theories about the nature of science and the character of scientific knowledge. Topics include the nature of confirmation, explanation, science vs. pseudo-science, instrumentalism vs. realism, and the ultimate aims of science. *Prerequisite:* Phil. 21 or a year of prior study in one of the science programs.

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 Third College humanities sequence.)

27. Ethics and Society (4)

(Same as Poli. Sci. 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)

An introduction to the study of classical Greek philosophy. The main emphasis of the course will be on the thought of Socrates, Plato, and Aristotle, but some consideration may also be given to pre-Socratic and Hellenistic philosophers. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

32. History of Philosophy: The Origins of Modern Philosophy (4)

An introduction to the study of early modern philosophy. Among the central concerns of the course will be the contrast between medieval and modern thought and the connection between the development of modern philosophy and the scientific revolution of the sixteenth and seventeenth centuries. Philosophers studied will include Descartes, Hobbes, Spinoza, and Leibniz, and possibly some medieval thinkers. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

33. History of Philosophy: Philosophy in the Age of Enlightenment (4)

An introduction to the study of the major philosophers of the late seventeenth and the eighteenth centuries. The course will focus largely on the British empiricists—Locke, Berkeley, Hume—and the "Critical Philosophy" of Kant. (May be used in fulfilling the Muir College breadth requirement and the Third College humanities sequence.)

90. Undergraduate Seminar: The Irrational (1)

An examination of recent psychological studies of human irrationality and their implications for epistemology, education, and social policy. Course may be repeated for credit (when topics vary) up to a total of three units.

UPPER DIVISION

101. Plato (4)

A study of some of the major dialogues of Plato. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

102. Aristotle (4)

A study of some of the major works of Aristotle. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

103. Medieval Philosophy (4)

An examination of the major trends of medieval philosophy through the study of selected texts by such authors as St. Augustine, Aquinas, Scotus, and Ockham. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

104. The Rationalists (4)

A study of some of the major writings of one or more of the seventeenth-century rationalists—Descartes, Spinoza, Leibniz. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

105. The Empiricists (4)

A study of the major writings of one or more of the British empiricists—Locke, Berkeley, Hume, Reid. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

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. May be repeated for credit with change of content. *Prerequisites:* department stamp required. Philosophy 33 or 105 required.

107. Hegel and His Critics (4)

A study of some of the essential features of the philosophy of Hegel and of the reaction to this philosophy on the part of thinkers such as Feuerbach, Marx, and Kierkegaard. *Prerequisite:* department stamp required. May be repeated for credit with change of content.

108. Mythology and Philosophy (4)

Study of various ancient Near Eastern mythologies in relation to early Greek philosophy.

110. Symbolic Logic I (4)

An introduction to the techniques of the predicate calculus, including relations and identity. Emphasis will be on acquiring skills in translating natural language into symbolic notation, in the various techniques of semantic evaluation, and especially in the use of natural deduction techniques. *Prerequisite:* Phil. 110 or consent of instructor.

111. Symbolic Logic II (4)

Introduction to axiomatic presentations of both the propositional and predicate calculi, and to their standard metatheory, which is the study of the important semantic and syntactic properties of these systems, such as expressive power, completeness, consistency, etc. *Prerequisite:* Phil. 110.

112. Advanced Logic (4)

An examination of topics in modal logic, free logic, relevance logic, or other non-standard interpretations and logical systems, plus appropriate metatheory. Course content will vary somewhat from year to year. *Prerequisite:* Phil. 110.

113. Philosophy of Mathematics and Logic (4)

The character of logical and mathematical truth; the relations between logic and mathematics; the significance of Godel's incompleteness result; Platonism, logicism, intuitionism, and more recent approaches. Course content may vary somewhat from year to year. *Prerequisite:* Phil. 110 or consent of instructor.

115. Philosophy of Logic (4)

Topics in philosophy of logic. Subjects covered vary from year to year. Typical topics include the problem of non-denoting terms (free logic), intensional contexts (Leibniz's law, identity, necessity, belief sentences). *Prerequisite:* Phil. 110.

120. Political Philosophy (4)

An examination of fundamental issues regarding the nature of the state, society, and government, usually by way of a comparison of the tenets of classical liberal theory and Marxism.

121. The State and Freedom (4)

An advanced course in political philosophy focusing on such topics as contemporary treatments of social justice and of human freedom from liberal, conservative, and radical perspectives.

122. Bio-Medical Ethics (4)

The course will examine moral issues arising in the medical and biological sciences. Possible topics include concept of health, patients' rights and professional responsibilities, behavior control, experimentation, genetic intervention, allocation of medical resources, and ethical issues concerning death, such as euthanasia, abortion, the rights of dying patients. *Prerequisite:* upper-division standing or consent of instructor.

123. Ethical Theories (4)

An examination of issues in ethical philosophy, with emphasis on the work of major historical figures in this area.

124. Contemporary Moral Issues (4)

An examination of contemporary issues in ethics, such as abortion, the treatment of animals, euthanasia, suicide, war. May be repeated for credit with change of content. *Prerequisite:* department stamp required.

126. Sex Differences: Origins and Implications (4)

(Same as Anthropology 123.) This interdisciplinary course focuses on the origins of sex differences and their political, social, and moral implications. Issues include evolutionary, biological, cross-cultural, and sociological evidence for sex differences; legal, economic, social, and psychological effects of present differential treatment of the sexes; moral issues concerning the justification of present practices; preferential treatment; sexual role stereotypes; and family organization. *Prerequisite:* upper-division standing or consent of instructor.

127. Professional Ethics (4)

An inquiry into the fundamental norms or principles of conduct in the various professions. The course will examine the theo-

retical foundations of such norms in relation to the most important ethical theories (utilitarianism, contract theories, rights theories, etc.); will explore the relation between professional and ordinary norms and conduct; and will discuss particular problem cases for various professions (legal, medical, business, engineering, etc.) in order to identify and examine those ethical features that may be unique to some professions.

128. Seminar: Topics in Modern Political Thought (4)
(Same as History 192 and Political Science 110K.) This course will examine the literature of specific individuals and topics, including Burke on revolution, Saint-Simon and Fourier on utopian systems, Marx on class, and Sorel on creative myth. *Prerequisite: upper-division standing or consent of instructor.*

130. Philosophy of Language (4)
Philosophical reflections on such linguistic universals as meaning, synonymy, analyticity, reference, grammar, and speech acts. A selection of contemporary articles will be discussed. Some background in linguistics or philosophy is desirable.

131. Topics in the Philosophy of Language (4)
A careful examination of a selection of topics in the philosophy of language. A typical assortment development of intensional and extensional fragments of English, the role and structure of propositions, conversation and linguistic contexts, formal and informal semantics.

135. Contemporary Analytic Philosophy: Russell and the Vienna Circle (4)
A course in the history of analytic philosophy dealing with the writings of Frege, Russell, Wittgenstein (*Tractatus*), Quine, Tarski, Carnap.

136. Contemporary Analytic Philosophy: Moore and Wittgenstein (4)
A course in the history of analytic philosophy dealing with Moore, the later Wittgenstein, Wisdom, and Austin.

140. Phenomenology and Existentialism: From Nietzsche to Heidegger (4)
A study of the thought of Nietzsche, Husserl, and Heidegger, with emphasis on the development of the phenomenological movement.

141. Phenomenology and Existentialism: Sartre and His Critics (4)
A study of existential phenomenology, through the works of its major representatives such as Sartre, Merleau-Ponty and others, as well as other recent philosophical movements on the European continent.

145. Nihilism (4)
A consideration of various claims about the end or collapse of the Western philosophical tradition, with particular emphasis on claims about the consequences of the absence of "ultimate" rational justification in morality, or even in science and philosophy. Readings will vary, but will most likely include works by Nietzsche, Dewey, Heidegger, Wittgenstein, Derrida; seminal texts in the history of moral and political thought; and selections from contemporary American philosophers concerned with the issue. *Prerequisite: upper-division standing or consent of instructor.*

150. Aesthetics (4)
An examination of major concepts and issues in aesthetics, such as truth, expression and imagination, the nature of the aesthetic attitude and of critical evaluation. *Prerequisite: upper-division standing or consent of instructor.*

152. Philosophy and Literature (4)
A study of philosophical themes as presented in selected fiction, drama, or poetry, as well as an inquiry into philosophical puzzles that arise in the appreciation and criticism of literature. *Prerequisite: upper-division standing or consent of instructor.*

153. Film Aesthetics (4)
A consideration of some special problems in aesthetics relevant to film as an art form. Topics may include the problem of a film's authorship; whether there are unique assumptions in film criticism and the relation between those assumptions and others relevant to literature, drama, and visual art; unity, theme, narration, and structure in film; "high art" — "low art" distinctions; films as representational.

160. Philosophy of Religion (4)
This course provides a general introduction to the philosophy of religion through the study of classical and 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.

161. Religious Existentialism (4)
This course will deal with the existential approach to the religious life and with conceptions such as faith, freedom, and guilt. Authors studied in a particular term may vary and will include Pascal, Kierkegaard, Dostoevski, Buber, and Tillich.

162. Philosophy of Law (4)
An introduction to selected topics and problems such as the nature of law and legal systems, the relationship of law to morality, theories of punishment and legal responsibility, issues of civil disobedience, privacy, paternalism, and affirmative action.

164. Philosophy of History (4)
A study of classical and contemporary conceptions of history and historical knowledge. *Prerequisite: upper-division standing or consent of instructor.*

170. Metaphysics (4)
The content of this course will vary from year to year, but in each case it will center around fundamental problems in metaphysics, such as the mind-body problem, problem of universals or the other-minds problem. The discussion of these issues may be either historical or analytic or both, depending upon the interests of the instructor.

171. Contemporary Works in Epistemology and Metaphysics (4)
The course will deal with a prominent figure or a central issue in contemporary epistemology and/or metaphysics. For example: Quine, Kripke, truth, realism, philosophical knowledge, naturalized epistemology, ontological commitment, primary and secondary qualities. *Prerequisite: Phil. 110 or consent of instructor.*

172. Knowledge and the External World (4)
An examination of some of the fundamental issues about the nature of knowledge gained through sensory experience, such as scepticism, the structure of knowledge, justification of knowledge claims, the nature of perception, sense-data theory, the problem of other minds.

173. Knowledge and Necessity (4)
A course in theory of knowledge dealing with topics such as the nature of our knowledge of the necessary truths of mathematics and logic, the estimation of the probability of untested hypotheses, the validity of the distinction between *a priori* and *a posteriori* knowledge (and related distinctions).

174. Philosophical Psychology (4)
An examination of issues in the philosophy of mind and philosophy of action, such as the nature of beliefs, emotions, and actions and the interrelationships between them; the nature of the mental and conceptual issues arising in psychology.

180. Advanced Philosophy of Science (4)
A detailed examination of some of the central problems in contemporary philosophy of science. Typical topics include current theories on the nature of explanation, the nature of scientific revolutions, inductive logic and rational methodology, and scientific realism vs. various anti-realisms. *Prerequisites: Phil. 110 and either Phil. 22 or consent of the instructor.*

181. Philosophy of Physics (4)
An introduction to some of the most prominent philosophical problems arising from the development of modern physics. Typical topics may include the philosophy of space and time, the epistemology of geometry, the philosophical significance of Einstein's theory of relativity, the significance of quantum mechanics, and modern cosmology. *Prerequisite: consent of instructor.*

182. Philosophy of Biology (4)
An examination of the philosophical problems generated by the biological sciences. Topics include the relation of biology to the physical sciences, the status and structure of evolutionary theory, the role of biology in social science, and others. *Prerequisite: consent of instructor.*

183. Philosophy of Psychology/Neuroscience (4)
This course examines the philosophical issues surrounding the scientific study of cognition, perception, and other mental phenomena. Topics include reductionism, functionalism, methodological and substantive issues in cognitive psychology, artificial intelligence, and the neurosciences. *Prerequisite: consent of instructor.*

184. Philosophy of the Social Sciences (4)
An examination of problems arising out of the concepts, methods, and goals characteristic of the social sciences. Topics include causal vs. rational explanations of behavior; the individual vs. the social whole as the unit of study; the role of values; and the meaning and possibility of objectivity and freedom as a presupposition or consequence of social theory.

185. Special Topics (4)
A course devoted to a specific philosophical problem. May be repeated for credit with change of content.

186. Technology and Human Values (4)
Traditional ideas of nature and the rise of modern science and technology. The influence of the rise of science and technology on political ideals, on human life, on freedom, education, and warfare.

187. Philosophical Aspects of Cognitive Science (4)
This course offers an introduction to some of the basic concepts in cognitive science, and considers some of the current debates about the nature and implications of cognitive theories. Topics may include mental representation, consciousness, rationality, nativism.

195. Introduction to Teaching in Philosophy (4)
Introduction to teaching philosophy. Under the supervision of the instructor, each student will run a class section in one of the philosophy department's courses. Attendance at lectures in the course and additional consultation with the instructor are required. *Prerequisites: upper-division standing and consent of instructor and department chair.*

196A. Philosophy Honors (4)
A program of independent study providing candidates for philosophy 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 196B. *Department stamp required.*

196B. 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 196A and 196B will be given at the completion of this quarter. *Department stamp required.*

198. Directed Group Study (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. (P/NP grades only.)

199. Individual Study (4)
Prerequisite: consent of departmental adviser. (P/NP grades only.)

GRADUATE

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 of the period, such as Kant's *Critique of Pure Reason* and Hume's *Treatise of 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: Phil. 110 or equivalent.*

211. Advanced Symbolic Logic (4)

Topics in mathematical logic and set theory, metatheory, non-standard logics, and other contemporary developments in logical theory. *Prerequisite: Phil. 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: Phil. 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 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 writing 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

OFFICE: Gymnasium, Revelle College

Supervisors

John W. Cates, M.A.
Barry Cunningham, Ed.D.
Howard F. Hunt, Ph.D., *Emeritus*
J. Charles Millenbah, M.A., *Chair*
Bert N. Kobayashi, Ph.D.
Judith M. Sweet, M.S., M.B.A.

Teachers/Special Programs

Check the current list of instructors located in the Main Office, Department of Physical Education. For information call (619) 534-0334.

GENERAL INSTRUCTIONAL PROGRAMS

The Department of Physical Education's General Instructional Program provides enthusiastic, contemporary, and comprehensive instruction in a wide variety of fitness and sport activities designed to meet the needs and interests of all students. In addition to offering classes at beginning, intermediate, and advanced skill and fitness levels, the department also provides instruction for students who may be either temporarily or permanently disabled.

FITNESS CONDITIONING

Based on student interest and in keeping with national trends, a major emphasis of the General Instructional Program in recent years has been on counseling and instruction designed to promote fitness, good nutritional habits, and healthy, active lifestyles. Physical education faculty members are available to all students for advice and suggestions on both personal programs and courses that will improve the level of students' health and fitness. Students are encouraged to establish positive attitudes and habits of lifetime fitness.

To this end, the General Instructional Program offers a multitude of fitness-related courses, including: weight training, coed conditioning, aerobics, rhythmical conditioning (using jazz and country western and ballroom dance routines), power walking, stretching/flexibility, triple fitness conditioning, interval running, and cycling. Optional fitness testing is available for all fitness/conditioning students. Results are analyzed, and students receive counseling.

FITNESS AND WELLNESS FOR LIFE (LECTURE/LAB)

Physical Education also offers a two-unit lecture/lab course, PE 100, Fitness and Wellness

for Life. The focus of this course is the acquisition of knowledge in basic exercise physiology, pertinent gross anatomy, psycho-social issues in exercise, and nutrition principles so that the individual student can develop a personalized cardiovascular program, create a strength and flexibility routine, develop improved eating habits and better nutritional awareness, and select appropriate stress management and relaxation techniques. While activities are used to illustrate the principles discussed, the course is designed to give the student the information necessary to make wise, lifetime health and activity choices. Therefore, lectures, labs, and practicums are used, rather than just activity sessions. Students are encouraged to sign up concurrently for one of the conditioning classes: coed conditioning, swim conditioning, aerobic dance, power walking, or water aerobics. This will provide a structured opportunity for students to apply the principles they are learning, help provide a social support system to encourage exercising, and supply an extended opportunity for them to meet the frequency requirement of a good exercise program.

AREAS OF INSTRUCTION

Certificate Courses

Lifesaving, Water Safety, CPR, and First Aid Instruction

Individual and Team Sports

Individual Sports

Tennis, Badminton, Golf, Racquetball, Tumbling and Trampoline, Karate, Fencing, and Accelerated Motor Skills.

Team Sports

Volleyball, Basketball, Softball, Soccer

Aquatics Program

Swimming, Skin Diving, Scuba Diving, Surfing, Swim Conditioning, and Water Aerobics

Rehabilitation and Disabled Program

Rehabilitation

Applied Rehabilitation

Disabled Students

Activities for the Disabled Student

For further information, call 534-7105.

FITNESS & LIFESTYLE PROGRAM

The Fitness and Lifestyle Program is a non-profit physical fitness assessment service provided to students, faculty, staff, and the UCSD community. Personalized assessment, evaluation

and consultation are conducted by Department of Physical Education faculty technicians who have a practical approach to fitness and lifestyle. For further information, call 534-0812.

Courses

Registration for physical education classes takes place along with regular academic enrollment. Consult the *Schedule of Classes* issued by the Office of the Registrar for specific course offerings. Not all courses are offered each quarter. Courses are offered at various skill levels with specific skill levels identified as follows:

Introductory level (intended for those with little or no previous experience in the activity).

Advanced beginning level (continued instruction and practice on basic skills).

Intermediate level (improvement of skill techniques and/or game strategy.)

Advanced level (for skilled participants with instruction to perfect techniques and sharpen competitive strategy).

1A-B. Swimming (.5)

Designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis.

1C. Swimming, Intermediate (.5)

This course is designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis. *Prerequisite: beginning swimming skills required.*

1D. Swim Conditioning, Advanced Beginning (.5)

Swimming for advanced beginning level swimmers who wish to utilize swimming as a physical conditioning class.

1E. Swim Conditioning, Intermediate (.5)

Swimming for intermediate level swimmers who wish to utilize swimming as a physical conditioning class.

3A. Lifeguard Training (.5)

Course meets Certification of American Red Cross Lifeguard Training requirements. Students will learn to identify and rescue a distressed or drowning victim in an aquatic environment and to recognize potential hazards associated with various types of aquatic facilities. *Prerequisites: intermediate swimming, P.E. 1C, and consent of instructor and/or complete prerequisite swim of 500 yards, swim underwater 15 yards, and tread water one minute.*

3B. Advanced Lifeguard Training (.5)

This course meets State Health Department and Emergency Medical Services approval certifications for public swimming pool lifeguards. In addition to advanced lifeguard training skills, CPR and First Aid Certifications will be awarded. Students must pass timed swim and dive tests to enter this course. *Prerequisites: Intermediate swimming, P.E. 1C, and consent of instructor.*

4. Water-Safety Instruction (.5)

Standard American Red Cross course designed to train authorized water-safety instructor to teach A.R.C. swimming and life-saving courses thereafter. *Prerequisite: only holders of the A.R.C. Senior Lifesaving Certificate are eligible to register. Students must pass Part I in order to qualify for Part II.*

6D. Advanced Open Water SCUBA Diver (.5)

This course is designed to introduce the beginning, newly certified, inexperienced SCUBA diver to the local marine environment in a safe and enjoyable manner. It will expose the diver to the basic elements of SCUBA and the oceanic environment so that confidence and enhancement of enjoyment can be gained. *Prerequisites: recognized basic SCUBA certification, with medical approval. Student must furnish all gear.*

6E. Boating SCUBA Diver (.5)

This course envelopes the operation, care, and maintenance of a small boat, "rules of the road" in boating, knot tying and the uses of knots, and boating etiquette, as well as the SCUBA diving activities and methods while operating from a small boat. *Prerequisites: P.E. 6D/Adv. Open Water SCUBA Diver, or consent of the instructor. Student must furnish all SCUBA gear.*

6F. Sea Resources SCUBA Diver (.5)

This course exposes the SCUBA diver to the vast richness of the sea. Through the methodology of SCUBA, the student will become knowledgeable about the nearshore oceanic resources in local water and their uses by industry and the food services. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish all SCUBA gear.*

6H. Deep SCUBA Diver (.5)

This course introduces the techniques and knowledge needed for the safe conduct of deep SCUBA divers. Decompression calculations, nitrogen narcosis, mandatory equipment, and sequential depth experiences are emphasized, with implementation on a weekly progression. Progressively deeper dives are accomplished by adherence to a safe sequence. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish own gear, to include submersible watch and depth gauge.*

6I. Research SCUBA Diver (.5)

This course exposes SCUBA divers to methodology, techniques, gear, and sampling protocol followed by research programs in conducting underwater SCUBA operations. The setting up of a project, determination of sampling methods, recording of observations, documentation and presentation of results are discussed and thoroughly analyzed. Familiarity with gear used in marine biology, submarine geology, and physical oceanography required. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver, or consent of the instructor. Student must furnish all SCUBA gear.*

6J. Search and Recovery/Night SCUBA Diver (.5)

This course exposes the experienced SCUBA diver to working under limited visibility conditions. Methods in the conduct of search operations underwater, the recovery of items located, and multiple-person team operations will be discussed and implemented. The conditions of limited visibility, especially in zero-visibility waters and in night dive operations, will be experienced. *Prerequisite: P.E. 6D/Adv. Open Water SCUBA Diver. Student must furnish all gear, including underwater flashlight and compass.*

7A. Skin-Diving (.5)

Techniques of skin-diving with practical experience in the ocean environment. Introductory course will include lectures on equipment, ocean environment, and principles of skin-diving. Pool training will precede ocean experience. *Prerequisite: physically fit.*

8E. Divemaster SCUBA Diver (.5)

This course trains the advanced and experienced SCUBA diver in the initiation, implementation, coordination, and logistics for a group and/or class SCUBA diver. Organization both on land and in the water will be stressed, as will the responsibilities of a divemaster. Development of leadership assertiveness and assumption of responsibility will be focused on throughout the course. *Prerequisites: P.E. 6D/Adv. Open Water SCUBA Diver plus P.E. 6E, 6F, 6H, and 6J, or consent of the instructor. Student must furnish all gear, including a safe second.*

8F. Assistant SCUBA Instructor Training (.5)

This course develops the teaching and organization skills of the Divemaster SCUBA Diver in both classroom and water sessions. Oral presentations, practical water skills teaching, and structuring lesson units will be emphasized. The elements of methods of instruction will be discussed and applied; teaching will be structured to reach a wide scope of target audiences.

Prerequisites: P.E. 8E/Divemaster SCUBA Diver, or consent of instructor. Student must furnish all SCUBA gear.

10A-B-C. Surfing (Beginning, Adv. Beg., Intermediate) (.5)

Surfing techniques taught in pool—including mounting, sitting, paddling and turning surfboard, safety techniques. After mastery of pool techniques, students surf in ocean. *Prerequisite: ability to swim 400 yards, basic lifesaving skills, and UCSD beginning swimmer's certificate.*

12. Water Aerobics (.5)

Physical conditioning class designed to improve cardiovascular health and fitness through a water exercise program. Course uses buoyancy effect of water to provide a safe alternative to weight-bearing activities. Students will participate in pre- and post-fitness evaluation testing.

13A. Racquetball, Beginning (.5)

This is an introductory course in which students will learn fundamental skills and rules. Students will learn basic serves, return of serves, forehands, backhands, court etiquette, and offensive and defensive strategies.

13B. Racquetball, Advanced Beginning (.5)

Continued instruction in fundamental skills, etiquette, and offensive and defensive strategies for students slightly beyond the beginning level of play. *Prerequisite: beginning racquetball or consent of instructor.*

13C. Racquetball, Intermediate (.5)

Intermediate racquetball is a course for those students who have taken the introductory racquetball course or have equivalent skills. Students will refine basic skills of racquetball and learn intermediate shots and strategies.

14A. Tennis, Beginning (.5)

Basic instruction in the serve, forehand drive, backhand drive, terminology, rules, scoring, and playing strategy for the 3-stroke game. *Prerequisite: none.*

14B. Tennis, Advanced Beginning (.5)

Continued instruction in the serve, forehand and backhand drives; and introduction to the volley, lob, overhead smash, and basic singles and doubles strategy. *Prerequisite: 14A or consent of instructor.*

14C. Tennis, Intermediate Strokes (.5)

Review of the serve, forehand and backhand drives, and concentrated instruction in the volley, lob, overhead smash, return of serve, and half-volley. *Prerequisite: 14B or consent of instructor.*

14D. Tennis, Intermediate Strategy (.5)

Instruction and drills in court tactics and strategy for single and doubles play utilizing all strokes, with emphasis on application in competitive play. *Prerequisite: 14C or consent of instructor.*

14E. Tennis, Advanced (.5)

Advanced instruction and drills in all strokes, tactics and court strategy for competitive play. *Prerequisite: 14D or consent of instructor.*

14F. Tennis, Stroke Improvement (.5)

Designed for students who have completed beginning and advanced beginning tennis but still have stroke deficiencies (i.e., weak or incorrect backhand drive or poor serve). The serve, backhand, and forehand drive are the three strokes to be improved or corrected.

15A-B-C-D-E. Badminton (.5)

Instruction in the fundamentals of the serve, strokes, volley, rules, scoring, tactics, and court strategy. Designed to allow both men and women students, novice and expert, an opportunity to participate.

16A-B-C. Volleyball (.5)

An emphasis on fundamental skills in serving, spiking, blocking, and teamwork techniques. Opportunity for team competition. *Prerequisite: next lower level course and consent of instructor.*

16E-F. Volleyball—Sand, Intermediate, Advanced (.5)

An emphasis on fundamental skills in serving, passing, spiking, blocking, and teamwork techniques. Opportunity for team competition.

17A-C. Golf (.5)

Instruction and practice in the fundamentals of golf. Emphasis is placed upon golf swing and techniques of using all clubs under varying conditions. Classes are offered in beginning and intermediate levels.

27A. Aerobic Conditioning, Beginning (.5)

A conditioning class using aerobics to improve cardiovascular performance, stamina, and overall fitness. Energetic exercise routines are done to music. Students are taught to monitor their own heart rates, and the significance of heart rate in terms of a fitness program is explained. General fitness concepts and approaches are also discussed. Blood pressure and skinfold (body fat) measurements will also be taken.

27C. Aerobic Conditioning, Intermediate (.5)

A more advanced conditioning class for those who know the basics. This course will place greater emphasis on improved muscular strength and flexibility, with an increase in duration intensity and progression. *Prerequisite: "good" or "excellent" score on 12 minute run or the Lifecycle Fitness Test given by the P.E. department, or consent of instructor.*

27E. Advanced Aerobic Conditioning (.5)

An advanced cardiovascular conditioning class for students who have successfully completed the intermediate level skills and wish to expand and further develop their level of fitness and their knowledge of cardiovascular conditioning. *Prerequisite: P.E. 27C.*

27F. Advanced Aerobic Conditioning—Light Weights (.5)

A conditioning class using ankle weights (2.5 lbs.) to improve strength, flexibility, and overall fitness. Exercise routines are done to music, and they adhere to strict placement techniques and concepts. Major muscle groups are discussed, along with their functions and capabilities in exercise.

29A. Soccer, Beginning (.5)

Instruction in fundamentals. Skills, game strategy, and team play are scheduled. 29A = Beginning; 29B = Advanced Beginning.

29B. Soccer, Advanced Beginning (.5)

To enhance and to take one stage further ball skills and general knowledge of the game, i.e., heading, passing, shooting on angling plays.

30. Softball Skills (.5)

Course instruction will include demonstrations, drills, and supervised play. Special emphasis will be focused on fielding/batting practice, other lead-up softball/baseball exercises, and team strategies. Course activities are designed to encourage maximum participation by all, regardless of their skills level.

31. Officiating Seminar (.5)

Students will enhance their current officiating skills by developing a more individualized officiating style. Activities include field trips to visit professional and local amateur officials. Stu-

dents will be evaluated by videotaped replay and instructor's observations.

32A-C. Interval Running for Conditioning (.5)

Designed to meet specific conditioning needs of each student through several different types of running such as hollow springs, interval sprints, slow and fast intervals, continuous fast running, and continuous slow running. The conditioning program will be individualized and determined by performance runs. A = Entry Level; C = Intermediate Level.

33A-C. Conditioning, Coed (.5)

Designed to meet individual needs of each student enrolled in class through personal evaluation of diet, measurements, and exercise program. Students who have already taken a class in physical conditioning, weight training, or who can run one or two miles, qualify for the intermediate course. Intermediate conditioning includes cardiovascular efficiency, weight training, isometrics, circuit training, crosscountry runs, etc. (NOTE: Occasionally, classes for combined levels are offered.)

34A-C. Weight Training (.5)

Principles and programs of weight training and related areas of fitness including circuit training, individual weight training routines, aerobic training, posture correction exercises, and diet and nutrition for health, exercise, and weight control.

35. Exercise, Nutrition, and Weight Control (.5)

Theory and practice of regular exercise and nutritional needs for development, maintenance, and continuation of good health and weight control.

36. Advanced Conditioning—Long Distance and Marathon Running (.5)

In addition to marathon training, class lectures include individualized fitness evaluation and training schedules, injury prevention, equipment, nutrition programs, blood and obesity in health factors, and psychological preparation for long distance running. *Prerequisite: ability to run a minimum of five miles.*

37A-B-C. Rhythmical Conditioning (.5)

Combines vigorous rhythmical exercises with the challenge of individual choreography. The course is enhanced through a variety of musical arrangements and individually adapted for low, medium, and high levels of participation.

38A-B-C-E. Basketball (.5)

Instruction in fundamentals are combined with opportunities for team play. Some previous knowledge of the game is desirable since emphasis will be on vigorous competition. A = Beginning; B = Adv. Beginning; C = Intermediate; E = Advanced.

39. Accelerated Motor Skills (.5)

Course activities are designed to enhance the quality of student leisure time/competitive sports skills. Accelerated learning will be encouraged through group and individualized use of relaxation techniques and mental rehearsal drills.

40A. Gymnastics/Coed/Beginning (.5)

An introduction to the beginning student. Apparatus adjustment, safety procedures and spotting techniques are taught. Emphasis on improving all components of physical fitness with attention to upper body strength. Tumbling and progressive skills are learned.

40C. Gymnastics/Coed/Intermediate (.5)

To improve skills of students having fundamental knowledge of gymnastics. Begins with conditioning and review. Includes apparatus, tumbling, and trampoline. Special emphasis on safety and spotting techniques. Students will develop routines from individual skills learned.

41. Power Walking for Conditioning (.5)

Designed to meet specific conditioning needs of each student through several types of walking such as power walking, striding, and race walking. The program will be structured to allow students to develop their walking abilities at their own pace.



42. Triple Fitness Conditioning (.5)

This course is designed to attain enjoyable forms of individual levels of conditioning by participating in a combination of three aerobic activities (bicycling, swimming, running) which will provide an ultimate state of physical fitness. *Prerequisites: PE 1C, 1D, 33A, or 33C or consent of instructor.*

45. Stretching/Flexibility Conditioning (.5)

To introduce and improve flexibility, regardless of physical condition or athletic skill. This class will demonstrate and direct stretching, beginning with slow, gentle movements and continuing with conformance to individual difference in muscle tension and flexibility.

46C. Fencing, EPEE (Electric), Intermediate (.5)

Classical French style, brief history, electrical equipment and safety, protocol and basic technique. Attacks, both simple and compound; defenses, simple and compound; strategy and directing of bouts using French terminology. *Prerequisite: beginning foil or consent of instructor.*

47A-C. Fencing, Foil (.5)

Classical French style. Protocol, on guard, advance and retreat, attacks (simple and compound), parries (simple and compound), strategy, and basic rules. A = Beginning; C = Intermediate. All levels of foil will not be taught each quarter. *Prerequisite: 47C requires consent of instructor or 47A.*

48C. Fencing, Sabre (.5)

Designed for intermediate and advanced students of fencing to continue their training in classical Hungarian sabre style fencing. (Sabre fencing may not be taught each quarter.) *Prerequisite: beginning and intermediate fencing (Foil).*

49. Fencing, Theatrical (.5)

Fencing techniques useful to students involved in performing arts. Emphasis will be upon choreography and dramatic presentation. *Prerequisite: fencing, (foil), beginning, (47A). Recommended: 47C.*

50A-B-C. Karate (.5)

Instruction and training in the fundamentals of Shotokan Karate, emphasizing: (1) basic stances and techniques; (2) "Kata," ancient stylized sequences of defensive and counter-offensive movements; (3) sparring, a graded progression from strictly controlled defense and counter-attack situations to free sparring for competition.

51A-C-D. Cycling (.5-.5-.5)

The wonderful world of the bicycle builds the exercise habit into daily routines. Proper riding techniques, care, maintenance, and safety considerations add up to extra thrills of exploring backroads, byways, and paths in a fifty-mile radius of campus or overnight trips for the advanced cyclist.

54A. First Aid (.5)

Standard first aid and personal safety course. Prepares the student to render life support first aid prior to making arrangements for transportation of victims. Training includes treatment of wounds, burns, poisoning, fractures, CPR, bandaging, splinting, heat and cold emergencies.

59A. Applied Rehabilitation for Post Muscle and Joint Trauma (.5)

For students with muscle and joint trauma who need specific information and instruction concerning the nature of tissue injury and a rehabilitation program, and to give the student preventive measures useful in avoiding further injury. *Prerequisite: referral of attending physician.*

59G. Physical Activity for the Disabled Student (.5)

Class activities designed to involve disabled students in a variety of individualized physical activities, modified sports and calisthenics; students will be encouraged to follow an individualized conditioning program as well as develop greater self-confidence.

59T. Athletic Training (.5)

Study and practice of athletic training techniques and emergency field care of athletic injuries. Presentation will include theory and techniques of basic athletic injury prevention, recognition, immediate treatment, emergency procedures, bandaging, and taping.

100. Fitness and Wellness for Life; Principles and Labs (2)

To provide students with the information to implement a lifetime fitness program. Acquisition of knowledge is the focus, so the student may make appropriate personal choices in the areas of cardiovascular activities, strengthening programs, flexibility exercises, stress management techniques, and dietary habits.

PHYSICAL EDUCATION/TEACHER EDUCATION

133. Fitness for Future Teachers (4)

A lab/lecture course presenting resource ideas, in fitness, for future elementary teachers. Students in this course will learn the principles of fitness and how to apply these principles to develop activity programs for children and for themselves.

INTERCOLLEGIATE ATHLETICS

Students participating in intercollegiate athletic teams may enroll in courses associated with the individual sports (some courses offer .5 credit). Teams may be men's, women's, or coed. Contact the Intercollegiate Athletics Office (534-4211).

PHYSICS

OFFICES:

General Administration: 1060-113 Urey Hall Addition, Revelle College

Graduate Student Affairs: 1060-121 Urey Hall Addition

Undergraduate Student Affairs: 1060-115 Urey Hall Addition

Chair's Office: 1060-113 Urey Hall Addition

Professors

- Henry D. I. Abarbanel, Ph.D.
- Ami E. Berkowitz, Ph.D., *CMRR Endowed Chair*
- James G. Branson, Ph.D.
- Keith A. Brueckner, Ph.D., *Emeritus*
- E. Margaret Burbidge, Ph.D., *Emeritus*,
Astronomy
- Geoffrey R. Burbidge, Ph.D.
- Joseph C. Y. Chen, Ph.D.
- Roger Dashen, Ph.D., *Chair*
- Patrick H. Diamond, Ph.D.
- Robert C. Dynes, Ph.D.
- George Feher, Ph.D., *Emeritus*
- Zachary Fisk, Ph.D.
- Donald R. Fredkin, Ph.D.
- George M. Fuller, Ph.D.
- John M. Goodkind, Ph.D.
- Robert J. Gould, Ph.D.
- Francis R. Halpern, Ph.D., *Emeritus*

- Jorge E. Hirsch, Ph.D.
- Barbara Jones, Ph.D.
- Norman M. Kroll, Ph.D., *Emeritus*
- 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*
- George E. Masek, Ph.D., *Emeritus*
- Carl E. McIlwain, Ph.D., *Emeritus*
- Melvin Y. Okamura, Ph.D.
- Thomas M. O'Neil, Ph.D.
- Hans P. Paar, Ph.D., *Vice Chair, Education*
- Laurence E. Peterson, Ph.D.
- Oreste Piccioni, Ph.D., *Emeritus*
- Sally K. Ride, Ph.D.
- Marshall N. Rosenbluth, Ph.D., *Emeritus*
- Ivan K. Schuller, Ph.D.
- Sheldon Schultz, Ph.D.
- Lu Jeu Sham, Ph.D.
- Harding E. Smith, Ph.D.
- Harry Suhl, Ph.D., *Emeritus*
- Clifford M. Surko, Ph.D.
- Robert A. Swanson, Ph.D., *Emeritus*
- William B. Thompson, Ph.D., *Emeritus*
- Harold Ticho, Ph.D., *Emeritus*
- Wayne Vernon, Ph.D.
- Arthur M. Wolfe, Ph.D.
- David Y. Wong, Ph.D., *Provost, Warren College*
- Nguyen-Huu Xuong, Ph.D.
- Herbert F. York, Ph.D., *Emeritus*

Associate Professors

- Daniel P. Arovas, Ph.D.
- David B. Kaplan, Ph.D.
- Oscar Lumpkin, Ph.D.
- Ann E. Nelson, Ph.D.
- Jose N. Onuchic, Ph.D.
- David R. Tytler, Ph.D.

Assistant Professors

- Daniel H. E. Dubin, Ph.D.
- Kim Griest, Ph.D.
- Frances Hellman, Ph.D.
- Elizabeth Jenkins, Ph.D.
- Scot R. Renn, Ph.D.

Adjunct Professors

- Edward C. Creutz, Ph.D.
- Alan M. Eisner, Ph.D.
- John M. Greene, Ph.D.
- Hans Kobrak, Ph.D.
- Tihiro Ohkawa, Ph.D.
- Philip M. Platzman, Ph.D.
- Terrence J. Sejnowski, Ph.D.
- Shmuel Shtrikman, D.Sc.
- Wayne A. Stein, Ph.D.
- Ronald E. Waltz, 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. in physics
- B.S. in physics with specialization in biophysics
- B.S. in physics with specialization in biophysics-premedical
- B.S. in physics with specialization in earth sciences
- B.A. in general physics
- B.A. in 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.

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 sub-

jects 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 or 7A (Chemistry 7A is strongly recommended).
3. Mathematics 2DA-EA-F or 2DH-EH-FH.

Upper Division

1. Physics 100A-B-C, 105, 110A-B, 120A-B, 130A-B, 140A-B, and two additional laboratory courses from the following group: 121, 131, 132, 133, or 199 with departmental approval.
2. Mathematics 110.
3. Restricted Electives: Three upper-division (four-unit) or graduate courses in natural sciences or mathematics, subject to departmental approval. For students who do not minor in mathematics, one of these electives must be in mathematics (Math. 120A recommended). Physics 130C is strongly recommended as an elective for students who plan to attend graduate school.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Phys. 110B	Phys. 120B
Phys. 110A	Phys. 120A	Phys. 130A
Math. 110		
SENIOR YEAR		
Phys. 130B	Phys. 140B	Restr. Elec.
Phys. 140A	Phys. 131*	Phys. 132* or 133*
Restr. Elec.		
Phys. 121*	Restr. Elec.	

*Students choose two out of these four senior lab 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 or 7A-B, and 6BL-CL.
3. BILD 1.
4. Mathematics 2DA-EA-F or 2DH-EH-FH.

Upper Division

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A-B, 153.
2. Chemistry 131, 140A-B, 143A.
3. BIBC 100, BIBC 103, BIMM 100, BICC 110, BICD 100.*
4. Mathematics 110.

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		Chem. 143A
SENIOR YEAR		
Phys. 130B	BIBC 103	Phys. 153
BIBC 100	Chem. 131	BIMM 100
BICD 100		BICC 110

*The Department of Biology is renumbering 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 (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 or 7A-B, and 6BL-CL.
3. BILD 1.*
4. Mathematics 2DA-EA-F or 2DH-EH-FH.

Upper Division

1. Physics 100A-B-C, 105, 110A, 120A-B, 130A, 153.
2. Chemistry 126 or 131, 140A-B, 143A.
3. BIBC 100, BICC 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		
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. 126 or 131	Phys. 153
BICD 100	Restr. Elec.	BICC 110 BIMM 100

*The Department of Biology is renumbering all biology courses effective fall quarter 1993. See "Biology" for conversion of old course numbers to new course numbers.

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:

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 or 7A-B, and 6BL.
3. Mathematics 2DA-EA-F or 2DH-EH-FH.

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		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 110A	Phys. 110B	Phys. 120B
Earth Sci. 101	Phys. 120A	Phys. 130A
Math. 110	Earth Sci. 102	Earth Sci. 103
SENIOR YEAR		
Phys. 105	Phys. 140B	Earth Sci. 120
Phys. 140A	Restr. Elec.	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 2A-B-C-DA-EA-F (or corresponding courses with H notations).

3. Three restrictive elective courses in science and engineering (a list of acceptable courses is given below).

Upper Division

1. Physics 100A-B, 110A-B, 120A, 129 or 130A, 140A or Chemistry 126 or 131.
2. Mathematics 110.
3. Restricted Electives: Sixteen units of upper-division courses in science and engineering.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 129 or 130A
Phys. 110A	Phys. 110B	
Math. 110		
SENIOR YEAR		
Phys. 140A (or Chem.)	Phys. 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 65, Introduction to Programming Techniques
 - CSE 70, Introduction to Systems Programming
 - Phys. 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 or 7A, General Chemistry or Honors Chemistry
- Chem. 6B or 7B, General Chemistry or Honors 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.

PHYSICS

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 2A-B-C-DA-EA-F (or corresponding courses with P or H notations).

Upper Division

1. Physics 100A-B, 110A-B, 120A, 129 or 130A.
2. Chemistry 140A or 141A, 143A.
3. Earth Sciences 101.
4. Mathematics 110.
5. TEP 171 A, B, C.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Chem. 143A
Phys. 110A	Phys. 110B	Phys. 129 or 130A
Math. 110	Chem. 140A	
SENIOR YEAR		
Earth Sci. 101	TEP 171B	TEP 171C
TEP 171A	Phys. 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 should consult with the Department of Physics, Undergraduate Student Affairs Office, 1060-115 Urey Hall Addition.

MINOR IN PHYSICS

Students may arrange minor programs or programs of concentration in physics by consulting with the Department of Physics, Undergraduate Student Affairs Office, 1060-115 Urey Hall Addition.

ADVISING OFFICE

Detailed information may be obtained from the Department of Physics, Undergraduate Student Affairs Office, 1060-115 Urey Hall Addition (619) 534-3290.

THE GRADUATE PROGRAM

The Department of Physics offers curricula leading to the following degrees:

- M.S. in physics
- C.Phil. in physics

- C.Phil. in physics (biophysics)
- Ph.D. in physics
- Ph.D. in physics (biophysics)

Entering graduate students are required to have a sound knowledge of undergraduate mechanics, electricity and magnetism; to have had senior courses or their equivalent in atomic and quantum physics, nuclear physics, and thermodynamics; and to have taken upper-division laboratory work. An introductory course in solid-state physics is desirable.

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 written 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 graduate students during registration week for the purpose of enabling the faculty to give them better guidance in their graduate work. Performance on this test has no bearing on the students' status in graduate school.

REQUIREMENTS FOR THE PH.D.

Students are required to pass a written examination, advanced graduate courses, an oral topic examination, a qualifying examination, and a final defense of the thesis as described below.

1. Departmental Written Examination

Physics students are required to take a written 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

- Phys. 200A (Theoretical Mechanics)
- Phys. 201 (Mathematical Physics)
- Phys. 212A (Quantum Mechanics)

Winter

- Phys. 200B (Theoretical Mechanics)
- Phys. 203A (Adv. Classical Electrodynamics)
- Phys. 212B (Quantum Mechanics)

Spring

- Phys. 203B (Adv. Classical Electrodynamics)
- Phys. 210A (Equilibrium Statistical Mechanics)
- Phys. 212C (Quantum Mechanics)

The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts two days, four hours per day. The examination may be repeated once, the next time it is offered.

Biophysics students take the written examination after completing two years of graduate work.

2. Advanced Graduate Courses

Physics students are required to take six advanced graduate courses, selected 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 five of the six 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.); Math. 210A, 210B, 210C (Math. Phys.); Math. 259A, 259B, 259C (Geom. Phys.)

Group 5: Physics 206 (Biophys.); 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 six 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 at the beginning 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 one-half hour talk on it to a faculty examination committee. The oral presentation is followed by approximately one hour 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 C.Phil. degree.

5. Teaching Requirement

All students are expected to participate in the physics undergraduate teaching program. After passing the departmental examinations and course requirements and before completing a dissertation, students are required to take a total of no fewer than two units of Physics 500 (Physics Instruction). Each unit corresponds to approximately five to six hours per week for one quarter in laboratory sections, recitation sections, or problem sessions. (This requirement may be

waived in special cases by the vice chair, education.)

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 for 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.

FALL	WINTER	SPRING
Phys. 1A	Phys. 1A	Phys. 1B
Phys. 1B	Phys. 1B	Phys. 1C
Phys. 1C	Phys. 1C	Phys. 1CL
Phys. 1CL	Phys. 1CL	Phys. 2AS
Phys. 2A	Phys. 2A	Phys. 2B
Phys. 2BL	Phys. 2B	Phys. 2BL
Phys. 2BS	Phys. 2BS	Phys. 2C
Phys. 2C	Phys. 2BL	Phys. 2CL
Phys. 2CS	Phys. 2CL	Phys. 2CS
Phys. 2CL	Phys. 2CS	Phys. 2DL
Phys. 2D	Phys. 2D	Phys. 4B
Phys. 2DL	Phys. 4A	Phys. 4E
Phys. 4C	Phys. 4D	Phys. 5
Phys. 5	Phys. 6	Phys. 10
Phys. 10		

The Physics 1 sequence is acceptable 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 a serious interest in physics. This five-quarter sequence is not an honors sequence; it 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.

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 and temperature, thermodynamics and the thermal properties of matter. *Prerequisites:* Math. 1A and concurrent enrollment in Math. 1B; or concurrent enrollment in Math. 2A or 2AH. (F,W)

1B. General Physics—Electricity and Magnetism (4)

Continuation of Physics 1A covering fluid statics and dynamics, 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:* Phys. 1A and concurrent enrollment in Math. 1C or Math. 2B or 2BH. (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:* Phys. 1B and Math. 1C or Math. 2B. (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:* Phys. 1B, and prior or concurrent enrollment in Phys. 1C. (F,W,S)

Courses

LOWER DIVISION

The lower-division courses are usually offered in the quarters indicated below:

PHYSICS

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: Math. 2A or 2AH, and concurrent enrollment in Math. 2B or 2BH.* (F,W)

2AS. Physics—Mechanics (4)

Same as Physics 2A except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Math. 2A or 2AH and concurrent enrollment in Math. 2B or 2BH.* (S)

2B. Physics—Electricity and Magnetism (4)

Continuation of Physics 2A covering charge and matter, the electric field, Gauss's law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, the magnetic field, Ampere's law, Faraday's law, inductance, electromagnetic oscillations, alternating currents and Maxwell's equations. *Prerequisites: Phys. 2A, Math. 2B or 2BH, and concurrent enrollment in Math. 2C or 2CH.* (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 Phys. 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: Phys. 2A, Math. 2B or 2BH, and concurrent enrollment in Math. 2C or 2CH.* (F,W)

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: Phys. 2B, Math. 2C or 2CH, and concurrent enrollment in Math. 2DA or 2DH.* (F,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: Phys. 2B, Math. 2C or 2CH, and concurrent enrollment in Math. 2DA or 2DH.* (F,W,S)

2CL. Physics Laboratory—Electricity and Magnetism, Waves, Optics (2)

One hour lecture and three hours' laboratory. Experiments to be chosen from refraction and interference using a laser, refraction, interference and diffraction of microwaves, lenses and the eye, acoustic resonance, the cathode ray oscilloscope and R-C circuits, LRC circuits, oscillations and damping, resonance and damping, measurement of magnetic fields, and the mechanical equivalence of heat. *Prerequisite: prior or concurrent enrollment in Phys. 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: Phys. 2B and Math. 2DA or 2DH.* (F,W)

2DS. Physics—Relativity and Quantum Physics (4)

Same as Physics 2D except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Phys. 2B and Math. 2DA or 2DH.* (Not offered in 1992-93, except in Summer Session.)

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 Phys. 2D, 2DS, or 4E.* (F,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: Math. 2A or 2AH and concurrent enrollment in Math. 2B or 2BH.* (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: Phys. 4A, Math. 2B or 2BH, and concurrent enrollment in Math. 2C or 2CH.* (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: Phys. 4B, Math. 2C or 2CH and concurrent enrollment in Math. 2DA or 2DH.* (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: Phys. 4C, Math. 2DA or 2DH and concurrent enrollment in Math. 2EA or 2EH.* (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: Phys. 4D, Math. 2EA or 2EH, and concurrent enrollment in Math. 2F or 2FH.* (S)

5. The Universe (4)

Descriptive (non-mathematical) introduction to modern astronomy with emphasis on the physical principles that govern the universe and its observed nature. Topics include the earth's place in the universe; the atom and light; the birth, life, and death of the sun and other stars; the Milky Way galaxy; normal and active galaxies; and cosmology. Physics 5 or 7, Earth Sciences 30 (The Oceans), and Earth Sciences 10 (The Earth) form a three-quarter sequence for general interest in science. 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 modern astronomy and astrophysics with emphasis on the physical principles that govern the universe. Topics include the earth's place in the universe; the atom and light; the birth, life, and death of the sun and other stars; the Milky Way galaxy; normal and active galaxies; and cosmology. This course is similar to Physics 5 but is recommended for students who are comfortable with precalculus level mathematics (algebra, proportions, logs, similar triangles). Physics 5 or 7, Earth Sciences 10 (The Earth), and Earth Sciences 30 (The Oceans) form a three-quarter sequence for general interest in science. Students may not receive credit for both Physics 5 and Physics 7. (W)

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. *Prerequisites: college algebra (community college Math. 140) or equivalent.* (F,S)

11. Introduction to General Physics (4)

This course is designed to introduce potential science majors to concepts in physics and to prepare them for further sequences in the sophomore year. Topics include kinematics, dynamics, energy momentum, and thermodynamics. Emphasis will be on problem solving. *Prerequisite: Math. 1A or 2A (or concurrent enrollment).* (Not offered in 1993-94.) (S)

90. Undergraduate Seminar—Physics Today (1)

Undergraduate seminars organized around the research interests of various faculty members. *Prerequisites: none.* (F,W,S)

UPPER DIVISION

(See also course listings: "Frontiers of Science.")

100A. Electromagnetism (4)

Coulomb's law, electric fields, electrostatics; conductors and dielectrics; steady currents, elements of circuit theory. Four hours' lecture. *Prerequisites: Phys. 2C or 4D, Math. 2DA-2EA-F or 2DH-EH-FH.* (F)

100B. Electromagnetism (4)

Magnetic fields and magnetostatics, magnetic materials, induction, AC circuits, displacement currents; development of Maxwell's equations. Three hours' lecture. *Prerequisites: Phys. 100A, 105.* (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. *Prerequisites: Phys. 100B, 105.* (S)

105. Computational Physics (4)

A laboratory-lecture course on practical computer programming. Topics include a review of Fortran, numerical methods, Monte-Carlo techniques, and the use of graphics to interpret results. Some previous experience with computer programming is expected. (Note: Students may not receive credit for both Physics 105 and any of the following courses: CSE 64, Math. 74, Math. 170A-B-C, Math. 174, Biol. 181, Chem. 134.) Two hours' lecture, three hours' laboratory. *Prerequisite: Phys. 4A-B-C-D-E or 2A-B-C-D or equivalent; Math. 2A-B-C-DA-EA, or 2AH-BH-CH-DH-EH, or equivalent.* (F,S)

110A. Mechanics (4)

Mechanics of systems of particles; conservation laws, planetary motion; linear oscillators; statics and dynamics of plane rigid bodies. Four hours' lecture. *Prerequisites: Phys. 2C or 4D, Math. 2DA-EA-F, or 2DH-EH-FH (co-registration in Math. 2F or 2FH permitted).* (F)

110B. Mechanics (4)

Special relativity; Lagrange's and Hamilton's equations; small oscillations of coupled systems; noninertial frames; general

motion of rigid bodies. Four hours' lecture. *Prerequisites: Phys. 105, 110A, Math. 2F or 2FH.* (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: Phys. 2CL and 2DL, Phys. 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. *Prerequisites: Phys. 120A-B or equivalent.* (W)

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 Phys. 2D, 4E, or equivalent, or consent of instructor.* (Not offered in 1993-94.) (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. Schrodinger 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: Phys. 2D, Math. 2DA-2EA.* (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: Math. 110 or equivalent, Phys. 2D, 4E, or equivalent, Phys. 100A-B-C or equivalent, Phys. 110A-B recommended.* (S)

130B. Quantum Physics (4)

Matrix mechanics, angular momentum and spin, Stern-Gerlach experiments, dynamics of two-state systems, approximation methods, Fermi golden rule, the complete hydrogen spectrum, identical particles. *Prerequisites: Phys. 110A, 130A.* (F)

130C. Quantum Physics (4)

Scattering theory, symmetry and conservation laws, systems of interacting particles, interaction of electromagnetic radiation with matter, the relativistic electron. *Prerequisites: Phys. 100C, 130B.* (W)

131. Modern Physics Laboratory (2)

Experiments in radioactivity, X-rays, atomic physics, resonance physics, solid-state physics, etc. Four hours' laboratory. *Prerequisites: Phys. 2CL and 2DL, Phys. 130A.* (W,S)

132. Modern Physics Laboratory (2)

Experiments in atomic physics, optics, physical electronics, fluid dynamics, surface physics, etc. Four hours' laboratory. *Prerequisites: Phys. 2CL and 2DL, Phys. 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: Phys. 105, 110A, and concurrent enrollment in 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: Phys. 130A and 140A.* (W)

150. Continuum Mechanics (4)

Mechanics of continuous media; waves, instabilities, applications to earth sciences, oceanography and aerodynamics. Three hours' lecture. *Prerequisite: Phys. 110B.* (S)

151. Plasma Physics (4)

Particle motions, plasmas as fluids, waves, diffusion, equilibrium and stability, nonlinear effects, controlled fusion. Three hours' lecture. *Prerequisites: Phys. 100A-B, 110A.* (S)

152. Introduction to Solid-State 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: Phys. 130B, 140B.* (S)

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: Phys. 100C, 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: Phys. 100B, 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: Phys. 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: Phys. 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: Phys. 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. Special Project (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)

GRADUATE

200A. Theoretical Mechanics (4)

Lagrange's equations and Hamilton's principle; Lagrangian for charges in electric and magnetic fields and for electro-mechanical systems, symmetry and constants of the motion, central forces and scattering theory, small oscillations, guiding center theory, parametric instabilities, pondermotive effect, adiabatic invariants *Prerequisite: Phys. 110B or equivalent.* (F)

200B. Theoretical Mechanics (4)

Hamilton's equations, canonical transformations, Hamilton-Jacobi theory, action-angle variables, canonical perturbation theory, adiabatic invariants, surface of sections, KAM theorem. *Prerequisite: Phys. 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

PHYSICS

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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: Phys. 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: Phys. 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)

Fundamental principles; recurrence, ergodicity, and mixing; entropy; microscopic basis of thermodynamics. Thermodynamics; equations of state; thermodynamic potentials; phase transitions. Statistical ensembles; Gibbs' distribution; classical and quantum statistics; Bose condensation; Sommerfeld expansion; applications. Classical interacting systems; cluster expansions; distribution functions. Other topics may include: Ornstein-Zernike Theory; Thomas-Fermi and Debye-Huckel approximations. Landau-Ginzburg Theory; Ising model; mean field theory; critical behavior of mean field theories; fluctuations; superconductivity. *Prerequisites: Phys. 140A-B, 152, or equivalent. Concurrent enrollment in Phys. 212B.* (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: Phys. 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: Phys. 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: Phys. 210A, 211A.* (W)

212A. Quantum Mechanics (4)

Hilbert space formulation of quantum mechanics and application to simple systems: states and observables, uncertainty re-

lations and measurements, time evolution, and mixed states and density matrix. Symmetries: commuting observables and symmetries, rotation group representations, Clebsch-Gordon coefficients, Wigner-Eckhardt theorem, and discrete symmetries (parity, time reversal, etc.). *Prerequisite: Phys. 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: Phys. 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: Phys. 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: Phys. 130C or equivalent, Phys. 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^+e^- interactions, deep-inelastic lepton-nucleon scattering, pp collisions, introduction to QCD. *Prerequisite: Phys. 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. *Prerequisite: concurrent enrollment in Phys. 212C.* (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: Phys. 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: Phys. 215A, 215B.* (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: Phys. 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:*

Phys. 212C or consent of instructor. (Not offered in 1992-93.) (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: Phys. 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, micro-instabilities and anomalous transport, and laser-plasma interactions relevant to inertial fusion. *Prerequisite: Phys. 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: Phys. 212C.* (S/U grades permitted.) (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: Phys. 200B.* (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: Phys. 210B and 221A.* (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: Phys. 130C or equivalent, Phys. 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: Phys. 130A-B or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.)

225A-B. General Relativity and Cosmology (4-4)

The principle of covariance, tensors and tensor transformations in special relativity, the principle of equivalence; tensor cal-

culus; foundations of general relativity, applications and tests of the theory, gravitational waves; applications in cosmology and observational tests of cosmological theories. *Prerequisite: consent of instructor.* (S/U grades permitted.) (F,W)

226. Galaxies and Galactic Dynamics (4)

The structure and dynamics of galaxies. Topics include potential theory, the theory of stellar orbits, self-consistent equilibria of stellar systems, stability and dynamics of stellar systems including relaxation and approach to equilibrium. Collisions between galaxies, galactic evolution, dark matter, and galaxy formation. *Prerequisite: consent of instructor.* (Offered in alternate years.)

227. Cosmology (4)

An advanced survey of topics in physical cosmology. The Friedmann models and the large-scale structure of the universe, including the observational determination of H_0 (the Hubble constant) and q_0 (the deceleration parameter). Galaxy number counts. A systematic exposition of the physics of the early universe, including vacuum phase transitions; inflation; the generation of net baryon number, fluctuations, topological defects and textures. Primordial nucleosynthesis, both standard and nonstandard models. Growth and decay of adiabatic and isocurvature density fluctuations. Discussion of dark matter candidates and constraints from observation and experiment. Nucleocosmochronology and the determination of the age of the universe. *Prerequisite: consent of instructor.* (Offered in alternate years.)

228. High-Energy Astrophysics and Compact Objects (4)

The physics of compact objects, including the equation of state of dense matter and stellar stability theory. Maximum mass of neutron stars, white dwarfs, and super-massive objects. Black holes and accretion disks. Compact x-ray sources and transient phenomena, including x-ray and γ -ray bursts. The fundamental physics of electromagnetic radiation mechanisms: synchrotron radiation, Compton scattering, thermal and nonthermal bremsstrahlung, pair production. Pulsars. Particle acceleration models. Neutrino production and energy loss mechanisms. Supernovae and neutron star production. *Prerequisites: Phys. 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: Phys. 211B.* (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: Phys. 212A-B.* (S/U grades permitted.) (Not offered in 1993-94.) (S)

233. Advanced Elementary Particle Theory (4)

Current problems in elementary particle theory. *Prerequisite: Phys. 215A.* (S/U grades permitted.) (Not offered in 1993-94.) (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: Phys. 218C or consent of instructor.* (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, clo-

sure methods, models of coherent structures. *Prerequisite: Phys. 218C or consent of instructor.* (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: Phys. 210A-B, 212C.* (S/U grades permitted.) (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)

254. Atomic and Molecular Physics Seminar (0-1)

Discussions of current research in atomic and molecular structures and collisions. (S/U grades only.) (Not offered in 1993-94.) (F,W,S)

255. Theoretical Solid-State Seminar (0-1)

Discussions of current research in theoretical solid-state physics. (S/U grades only.) (Not offered in 1993-94.) (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)

259. Biophysics Seminar (0-1)

Discussions of current research in biophysics. (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. (S/U grades permitted.) (F,W,S)

500. Physics Instruction (1-4)

Credit may be obtained for participation in undergraduate teaching as follows: one unit is equivalent to (a) two one-hour recitation sessions without grading; (b) one one-hour recitation session with grading; (c) one two-hour problem section; or (d) one three-hour laboratory section. Weekly meeting with instructor is required. (S/U grades only) (F,W,S)

POLITICAL SCIENCE

OFFICE: Third College Humanities Building

Professors

Ellen T. Comisso, Ph.D.
Wayne A. Cornelius, Ph.D.
Peter F. Cowhey, Ph.D.
Gary W. Cox, Ph.D.
Paul Drake, Ph.D.
Peter A. Gourevitch, Ph.D.
Germaine A. Houston, Ph.D.
Peter H. Irons, Ph.D., J.D.
Gary C. Jacobson, Ph.D., *Chair*
Samuel H. Kernell, Ph.D.
David A. Lake, Ph.D.
Sanford A. Lakoff, Ph.D.
Arend Lijphart, Ph.D.
Mathew D. McCubbins, Ph.D.
Samuel L. Popkin, Ph.D.
Susan L. Shirk, Ph.D.
Peter H. Smith, Ph.D.
Tracy B. Strong, Ph.D.

Adjunct Professors

Stephen Haggard, Ph.D.
Chalmers Johnson, Ph.D.
Miles Kahler, Ph.D.

Associate Professors

Nathaniel L. Beck, Ph.D.
Amy Bridges, Ph.D.
Ann L. Craig, Ph.D.
Steven P. Erie, Ph.D.
Harry Hirsch, Ph.D.
Victor V. Magagna, Ph.D.
David R. Mares, Ph.D.
Kaare Strom, Ph.D.

Adjunct Associate Professor

Daniel Hallin, Ph.D.

Assistant Professors

Alan C. Houston, Ph.D.
Arthur W. Lupia, Ph.D.

Paul A. Papayouanou, Ph.D.
Philip G. Roeder, Ph.D.

Adjunct Assistant Professors

Richard Kronick, Ph.D.
Matthew F. Shugart, Ph.D.

THE MAJOR PROGRAM

Political science addresses some of the fundamental problems facing human society. Questions concerning world peace, government policies aimed at achieving economic stability and growth, the management of environmental quality, control over political competition, the possibility of using law to affect social and political change, and the gap between the rich and poor in the U.S. and abroad are all on the research agenda of contemporary political scientists. The general purpose of the major is to address these and other issues systematically, and, simultaneously, to raise the broad theoretical questions which can help students relate today's political debates to those debates about politics which have kept a theoretical tradition alive for over 2,000 years.

Majors are required to take the full introductory sequence made up of 10, 11 and 12, and any twelve four-unit upper-division courses. All political science majors are strongly encouraged to take at least one quarter of the P.S. 110A-B-C sequence and P.S. 170A. The department also requires that all students declaring the political science major as of fall 1986 take Social Science 60 Elementary Statistics for the Social Sciences. (Political Science 60 may be substituted for this course.) This course should preferably be taken by the second quarter of the student's junior year. Students may substitute either Political Science 170A or Economics 120A for this requirement, or petition for an equivalency. Double majors may, under certain circumstances, be exempted from the statistics requirement; they should contact the undergraduate adviser.

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 requirement if approved by the department on the basis of individual petition.

Students who pass the Advanced Placement (AP) Tests in American or Comparative Politics may petition to be exempted from taking P.S. 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 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 adviser.

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 adviser for more information.

Students must maintain an overall 2.0 GPA in the major. Students must also attain a C- in any course counted toward completion of the major. Candidates for departmental honors are required to take P.S. 191A and B in which they write a senior thesis. (A 3.5 GPA in the major is currently a prerequisite 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*. If students have any specific questions regarding law, we advise them to consult with the prelaw adviser.

Increasingly, political science majors are preparing for careers in *business* or as *policy an-*

alysts 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.

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. P.S. 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.

P.S. 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, 120, and 166).

Comparative Politics

P.S. 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

P.S. 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-AB). 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.

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: Wayne Cornelius, director, Center for U.S.-Mexican Studies; Samuel Kernell, coordinator, American Political Institutions Project; Peter Smith, director, Center for Iberian and 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 field 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.

Many students will have defended their thesis before the beginning of their fourth year. It is expected that students will complete their theses within five years of starting the program. Students who undertake fieldwork may take one extra year.

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 six years. Total registered time at UCSD cannot exceed seven years.

Courses

LOWER DIVISION

7. Introduction to Politics for Non-Political Science Majors (4)

The purpose of this course is to impart basic political literacy to students who have never had any political science. Democracy is examined both theoretically and institutionally, by comparing the American political system with that of other countries. The basic "text" is the U.S. Constitution. *Prerequisites: this course cannot be used as credit toward the major; cannot be taken together with P.S. 10, can be followed by P.S. 11 and 12 if needed for a sequence.*

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.

11W. Writing in Comparative Politics (2)

This course, to be taken in conjunction with Political Science 11, is designed to provide tutorial help for students wishing to improve their writing skills in the political science discipline. (W)

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.

12W. Writing in International Relations (2)

This course, to be taken in conjunction with Political Science 12, is designed to provide tutorial help for students wishing to improve their writing skills in the political science discipline. (S)

14. Politics and the Third World Poor (4)

(Same as Third World Studies 14.) This course explores the context, structure, purpose, and fate of collective political action by the urban and rural poor in Latin America, Asia, and Africa. It examines local as well as national political organizations and their economic, social, and cultural foundations.

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 P.S. 60 and Social Science 60, Psychology 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: P.S. 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: P.S. 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: P.S. 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: P.S. 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: P.S. 10 or consent of instructor.*

100G. American Politics and Public Policy (4)

Students in this course will study a number of arguments about the determinants of public policy. Class materials examine interest group, power elite, structuralist, electoral, and cultural theories, among others. Policy case studies will be provided for evaluating alternative theories. *Prerequisite: P.S. 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: P.S. 10 or consent of instructor.*

102B. Politics of American Economic Policy (4)

(Formerly P.S. 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: P.S. 10 or consent of instructor.*

102C. American Political Development (4)

(Formerly P.S. 122) American political development will be examined from both a comparative and theoretical perspective with special attention given to the interplay of societal and political change. The modernization of Congress, political parties, the bureaucracy, the federal system, and the judiciary will be examined. *Prerequisites: P.S. 10 and 11.*

102DA-DB. Public Opinion and Political Ideology (4-4)

(Same as Com/SF 124A and Com/SF 124B.) 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: P.S. 10 or consent of instructor.*

102E. Urban Politics (4)

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: P.S. 10 or consent of instructor.*

102G. Seminar—Special Topics in American Politics (4)

(Formerly P.S. 163) An undergraduate seminar designed to give students who have already had some course experience in upper-division American politics classes an opportunity to study some aspect of current American politics in greater depth in a small group setting. *Prerequisites: P.S. 10 and one upper-division class in American politics.*

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: P.S. 10 or consent of instructor.*

102IA-IB. The American News Media (4-4)

(Same as Com/Cul 173 and Sociol. 165.) 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 re-

quires a research paper. *Prerequisites:* for 102IA, P.S. 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:* P.S. 10 or consent of instructor.

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:* P.S. 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:* P.S. 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:* P.S. 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:* P.S. 10 or consent of instructor.

105A. Comparative Legal Cultures (4)

A systematic and comparative treatment of the role of courts in various national settings. The impact of the judicial system on the interplay between the legal and political cultures of Western democratic societies, of communist and some developing countries will be examined. *Prerequisite:* P.S. 10 or consent of instructor.

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:* P.S. 10 or consent of instructor. P.S. 100A or 100B strongly recommended.

■ 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:* P.S. 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:* P.S. 110B recommended.

110DA. Contemporary Political Thought (4)

(Formerly P.S. 102A) 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.

110K. Undergraduate Seminar (4)

An undergraduate seminar designed to give students who have already had some course experience in upper-division political theory an opportunity to study some aspect of political theory in greater depth in a small group setting. *Prerequisite:* two upper-division courses in political theory or consent of instructor.

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.

■ 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:* P.S. 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:* P.S. 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:* P.S. 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:* P.S. 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:* P.S. 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: P.S. 11 or consent of instructor.*

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: P.S. 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: P.S. 11 or consent of instructor.*

126AA. Fundamentals of Political Economy (4)

The first half of this two-quarter course will focus broadly on how economic behavior affects political action and institutions, and how political action and institutions affect economic behavior. Central consideration will be given to the impact of democratic political systems on various types of economic arrangements and vice versa. *Prerequisite: P.S. 11 or consent of instructor.*

126AB. Issues in Political Economy (4)

The second half of this two-quarter course will deal in depth with one or a number of specific issues touched on in the first half of the course (126AA) and dealt within the framework developed there. Issues may cover such topics as labor and politics, corporatism, politics and economics of bureaucratic organizations, the welfare state, equality, and other such questions. *Prerequisite: P.S. 126AA.*

130AA. Soviet Politics and After (4)

An analysis of the rise and decline of the Soviet Union and the politics of its successor regimes. *Prerequisite: P.S. 11 or consent of instructor.*

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: P.S. 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.*

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: P.S. 11 or consent of instructor.*

130H. Vietnam: The Politics of Intervention (4)

(Formerly P.S. 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: P.S. 11 or consent of instructor.*

132A. Political Modernization Theory (4)

(Formerly P.S. 139) A survey of state building and the politics of economic development in a world historical perspective. *Prerequisite: P.S. 11 or consent of instructor.*

133A. Introduction to Japanese Politics (4)

This course will analyze the political systems of modern Japan in comparative-historical perspective. *Prerequisite: P.S. 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: P.S. 11 or consent of instructor.*

133D. Japanese Foreign Policy (4)

This course will examine Japan's rise, fall, and rebirth as a world economic and military power, with emphasis on developments since the early 1970s. It will include the formation of foreign policy, changing conceptions of national interest and world order, and the impact of Japan on the world. *Prerequisite: P.S. 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: P.S. 11 or consent of instructor.*

134AA-AB. Comparative Politics of Latin America (4-4)

(Formerly P.S. 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. *Prerequisite: P.S. 11 or consent of instructor for 134AA; P.S. 134AA for 134AB.*

134B. Politics in Mexico (4)

(Formerly P.S. 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: P.S. 11 or consent of instructor.*

134D. Selected Topics in Latin American Politics (4)

(Formerly P.S. 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: P.S. 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: P.S. 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: P.S. 11 or consent of instructor.*

134J. Labor and Politics in Latin America (4)

The course explores the relationships between labor movements and the state, political parties, ideologies, and economic change in Latin America. Is organized labor in Latin America

captive or powerful? Does it mobilize for stasis or change? Complex answers derived from a survey of cases and models describing workers' participation in Latin American politics. *Prerequisite: P.S. 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: P.S. 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: P.S. 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: P.S. 134AA or consent of instructor.*

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: P.S. 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: P.S. 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.

138A. The Political Economy of Urbanization (4)

(Formerly P.S. 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: P.S. 11 or consent of instructor.*

138D. Special Topics in Comparative Politics (4)

An undergraduate seminar designed to give students who have already had some course experience in upper-division comparative politics an opportunity to study some aspect of current comparative politics in greater depth in a small group setting. *Prerequisite: P.S. 11 and two upper-division courses in comparative politics.*

139A. Politics of the Ancient World Order (4)

An introduction to the domestic and international political orders of the ancient West. Primary focus will be on the strengths and limitations of comparative and international relations theories when applied to the ancient world of city-states, kingdoms, and empires. *Prerequisite: P.S. 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. *Prerequisite: P.S. 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: P.S. 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: P.S. 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: P.S. 12 or consent of instructor.*

142I. National and International Security (4)

A survey of theories of defense policies and international security. *Prerequisite: P.S. 12 or consent of instructor.*

144AA-AB. Politics and the International Economic Order (4-4)

(Formerly P.S. 155A-B) This course examines the interplay of politics and economics in international relations. The first quarter 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. The second quarter 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. *Prerequisites: P.S. 12 for 144AA and one quarter of economics are recommended; prerequisite for P.S. 144AB, consent of instructor.*

144D. Political Dimensions of International Finance (4)

(Conjoined with P.S. 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.

145B. Conflict and Cooperation in International Politics (4)

Seminar 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: P.S. 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: P.S. 11, 12 or consent of instructor.*

146D. Political Parties in Latin America (4)

Compares and contrasts different types of political parties in Latin America: conservative, liberal, populist, Christian democrat, socialist, and communist. Investigates their origins, ideologies, programs, leadership, followings, organizations, and successes or failures within varying political systems in different countries. *Prerequisite: P.S. 11 or consent of instructor.*

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: P.S. 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: P.S. 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.*

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: P.S. 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: P.S. 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: P.S. 10 or consent of instructor.*

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: P.S. 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: P.S. 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: P.S. 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. *Prerequisites: P.S. 160 AA-AB, or P.S. 102B or P.S. 100G.*

■ **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: Social Science 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: P.S. 10, 11, and 12. GPA minimum 3.3 or consent of instructor.*

■ **SPECIAL STUDIES**

191A-B. Senior Honors Seminar: Frontiers of Political Science (4-4)

This course will be taught jointly by the staff of the department with occasional lectures by visitors. It is open only to seniors interested in qualifying for departmental honors. Admission to the course will be determined by the department on the basis of the student's academic record. Each student enrolled will be required to write an honors essay under the supervision of a member of the faculty. This essay, which is to be submitted by the end of the winter quarter, will be the basis of the final grade for the course. *Prerequisites: senior standing, GPA of 3.5 in political science, or consent of the department.*

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. Political Theory: Themes and Texts (4)

An analysis of important political theorists and their themes. Readings from Machiavelli, Hobbes, Walzer, Locke, Nozick, Rousseau, Rawls, Nietzsche, and Foucault. Themes include representation and citizenship, ownership and rights, authority and individualism. This course is required of all graduate students in political science. No prior graduate 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.

210DC. Contemporary Political Theory (4)

This seminar focuses on selected theorists 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 consent. Students will meet with P.S. 110DC and hold a separate discussion section.

211. Political Thought: Ancient and Medieval (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 Thucydides, Plato, Aristotle, and Augustine. *Prerequisite: graduate standing.*

212. Political Thought: Machiavelli to Rousseau (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 Machiavelli, Hobbes, Locke, and Rousseau. *Prerequisite: graduate standing.*

213. Political Thought: Kant 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 Kant, Hegel, Marx, Mill, and Nietzsche. *Prerequisite: graduate standing.*

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. *Prerequisites: P.S. 11 for 123A; 123A for 123B.*

224. The Politics of Democratization (4)

This course will examine the following questions: Why do some countries fail and other 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 multi-ethnic 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.*

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.

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.*

241. International Relations (4)

This course will provide a general literature review in international relations to serve as preparation for the field examination. *Prerequisite: graduate standing in any discipline in the social sciences or humanities, or consent of instructor.*

242. 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 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.*

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 in the social sciences or humanities or consent of instructor.*

255. Subnational Government (4)

Concentrating on the United States, students in this course will examine theories of federalism; the role of sections or regions in American political development; the political development of state governments and their current role in governance; the political development of cities and their place in U.S. politics. *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.*

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. *Note: undergraduates may take this course only with the consent of the instructor and completion of P.S. 112A.*

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 ten-twelve 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.*

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

ADMINISTRATIVE OFFICE: 5217 McGill Hall,
Muir College

STUDENT SERVICES OFFICE: 1533 McGill Hall
Annex

Professors

Norman H. Anderson, Ph.D.
Stuart M. Anstis, Ph.D.
Richard C. Atkinson, Ph.D., *Chancellor*
Elizabeth A. Bates, Ph.D.
Michael Cole, Ph.D.

Diana Deutsch, Ph.D.
J. Anthony Deutsch, D.Phil.
Ebbe B. Ebbesen, Ph.D.
Edmund J. Fantino, Ph.D.
Vladimir J. Konecni, Ph.D.
Donald I.A. MacLeod, Ph.D.
George Mandler, Ph.D.
Jeffrey O. Miller, Ph.D.
Harold E. Pashler, Ph.D.
Vilayanur S. Ramachandran, Ph.D., M.B.B.S.
Laura E. Schreibman, Ph.D., *Chair*
David A. Swinney, Ph.D.
Ben A. Williams, Ph.D.

Associate Professors

James A. Kulik, Ph.D.
Joan Stiles, Ph.D.

Assistant Professors

Gordon C. Baylis, D.Phil.
Nicholas Christenfeld, Ph.D.
Brett A. Clementz, Ph.D.
Manuel F. Gonzalez, Ph.D.
Judith C. Goodman, Ph.D.
Allen M. Osman, Ph.D.
John T. Wixted, Ph.D.

Emeriti Professors

Norman H. Anderson, Ph.D.
Robert M. Boynton, Ph.D.

Thomas Albright, Ph.D., *Associate Adjunct Professor of Psychology*
Ursula Bellugi, Ed.D., *Adjunct Professor of Psychology*
Nelson M. Butters, Ph.D., *Professor in Residence, Psychiatry*
Francis Crick, Ph.D., *Adjunct Professor of Psychology*
Philip M. Groves, Ph.D., *Professor of Psychiatry*
Steven A. Hillyard, Ph.D., *Professor of Neurosciences*
George F. Koob, Ph.D., *Adjunct Professor of Psychology*
William J. McGill, Ph.D., *Adjunct Professor of Psychology*
John M. Polich, Ph.D., *Adjunct Professor of Psychology*
Pamela A. Sample, Ph.D., *Assistant Professor in Residence, Ophthalmology*
David S. Segal, Ph.D., *Professor of Psychiatry*
Terrence J. Sejnowski, Ph.D., *Professor of Biology*
Cheryl L. Spinweber, Ph.D., *Adjunct Associate Professor of Psychology*
Larry R. Squire, Ph.D., *Professor in Residence, Psychiatry*
Paul E. Touchette, Ph.D., *Adjunct Associate Professor of Psychology*

THE UNDERGRADUATE PROGRAM

THE PSYCHOLOGY MAJOR PROGRAM

The department offers courses in all major areas of experimental psychology, with emphasis in the areas of cognitive psychology and human information processing, sensation and perception, learning and behavior analysis, physiological psychology, developmental psychology, psycholinguistics, and social psychology. The department emphasizes research in the experimental and theoretical analysis of human and animal behavior. 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 listings for the courses.

A B.A. degree in psychology will be granted if the following requirements have been met:

1. Three quarters of natural science other than psychology (i.e., biology, chemistry, and physics). This requirement should be fulfilled by taking *general introductory* courses in the physical sciences. Special topics courses within science departments (e.g., nutrition) will be accepted only if they had a general introductory course as a prerequisite and the student has satisfied this prerequisite before taking the special topics course.

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
- Physics: Any of the 1 and 2 series, 10, 11

2. Three quarters of formal skills, at least one of which must be calculus. The other two quarters may consist of any combination of courses in calculus or logic. Acceptable calculus courses include Math. 1A-B-C and Math. 2A-B-C. Acceptable logic courses include Philosophy 10 and 12.

3. Introduction to computer programming (CSE 62A, CSE 62B, CSE 65, AMES 5 or AMES 10 at UCSD, or equivalent). Other courses will be accepted only if they are primarily concerned with programming in a high-level computer language.

All of these courses may be taken Pass/No Pass.

4. One quarter of statistics (Psychology 60, Economics 120A, Social Science 60, Math. 6A, or equivalent). Statistics must be taken for a letter grade.

Students should complete these prerequisite requirements by the end of the sophomore year.

MAJOR REQUIREMENTS

A minimum of **twelve** upper-division courses in psychology are required. Upper-division courses must be taken for a grade to count toward the major. Neither Psychology 199 nor Internship 197 can be counted toward the major, and Psychology 195 may be counted only once. Upper-division psychology courses taken on a Pass/No Pass basis prior to declaring as a psychology major cannot be used to satisfy a major requirement. Graduate research seminars (usually designated as "Special Topics in . . .") cannot be counted toward the major. **A minimum of six upper-division courses must be taken at UCSD.** A grade-point average of at least 2.0 in the upper-division courses is required for graduation.

For students beginning their major in 1989-90, or later, there are specific course requirements in addition to the overall requirement of twelve upper-division courses. The specific course requirement is satisfied by taking **five of the following six courses: Psychology 101, 102, 103, 104, 105, 106.** These courses are broad introductions to the major areas of psychology represented in the department. These requirements do not apply to students who have declared their major prior to fall 1989.

The remaining courses of the twelve-course requirement may be any other courses offered in the Department of Psychology. For the convenience of students who wish to pursue an area in depth, the courses are listed below according to the major areas to which they relate. Note that some courses are listed under more than one area; others are not listed under any area (e.g., Psychology 166: History of Psychology). Note also that the more advanced courses typically have as prerequisites one or more courses numbered 101-106. Students interested in pursuing a particular area in depth are strongly encouraged to contact a faculty adviser in that area.

COGNITION

- | | |
|----------------|----------------|
| Psychology 105 | Psychology 145 |
| Psychology 115 | Psychology 148 |
| Psychology 129 | Psychology 152 |
| Psychology 136 | Psychology 156 |
| Psychology 137 | Psychology 158 |

DEVELOPMENT

- | | |
|----------------|----------------|
| Psychology 101 | Psychology 145 |
| Psychology 114 | Psychology 156 |
| Psychology 117 | Psychology 167 |
| Psychology 128 | Psychology 168 |
| Psychology 136 | |

LEARNING AND BEHAVIOR ANALYSIS

- | | |
|----------------|----------------|
| Psychology 103 | Psychology 146 |
| Psychology 120 | Psychology 154 |
| Psychology 121 | Psychology 168 |

PHYSIOLOGICAL PSYCHOLOGY

- | | |
|----------------|----------------|
| Psychology 106 | Psychology 164 |
| Psychology 129 | Psychology 172 |
| Psychology 137 | Psychology 176 |
| Psychology 152 | Psychology 179 |
| Psychology 159 | Psychology 181 |

SENSATION AND PERCEPTION

- | | |
|----------------|----------------|
| Psychology 102 | Psychology 138 |
| Psychology 116 | Psychology 159 |
| Psychology 129 | Psychology 169 |

SOCIAL PSYCHOLOGY

- | | |
|----------------|----------------|
| Psychology 104 | Psychology 158 |
| Psychology 127 | Psychology 160 |
| Psychology 148 | Psychology 162 |
| Psychology 149 | Psychology 185 |
| Psychology 155 | |

ADVISING

All students are strongly encouraged to choose a permanent adviser. Advisers are assigned at the Student Services Office (Room 1533, McGill Hall Annex) when the student announces his or her intention to major. The student then plans his or her 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 he or she obtain a strong general background in psychology, a strong background in statistics and experimental methods, and a strong background in research, including laboratory courses and independent research. A recommended program of study to accomplish these goals is the following:

1. At least five courses from the group numbered Psychology 101-106

2. At least one (and preferably more) laboratory courses(s) (Psychology 114, 115, 116, 117, 121, 127)
3. Introduction to Statistics and Advanced Statistics (Psychology 60 and 111)
4. The Senior Independent Research Project (Psychology 194A-B-C)

PREPARATION FOR 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 of a strong major in psychology, and are preferred over a large number of courses in one particular area. Undergraduate courses in clinical psychology are offered at UCSD, but primarily by temporary lecturers (which results in their not being listed in the catalog; information regarding such courses can be obtained from the department office). Students are strongly advised **not** to take a large number of such courses in lieu of the recommended program of study listed above.

HONORS PROGRAM

Students are encouraged to participate in the department honors program. Requirements for the program, in addition to the prerequisite and major requirements listed above, are the following:

1. Advanced Statistics (Psychology 111)
2. At least one laboratory course (Psychology 114, 115, 116, 117, 121, 127) or one Psychology 199 course. Psychology 199 can be used to replace the laboratory course BUT it will NOT COUNT as one of the required twelve courses.
3. The two-quarter Honors Seminar (Psychology 110A and B)
4. A year-long independent research project (Psychology 194A-B-C) that culminates in an honors thesis.

Admission to the honors program is granted by application to the Department of Psychology in the fall quarter of the student's junior year. The application deadline is October 25. Such admission is required for registration in Psychology 110A-B (the Honors Seminar) which is offered in the winter and spring quarters. Upon admission, students will be assigned a permanent adviser, who will work closely with the student in the remaining quarters of the major.

Successful completion of the honors program requires a grade of A in Psychology 194 and a

minimum grade-point average of 3.5 for courses taken in the major.

The honors program is strongly recommended for all students interested in graduate schools.

UNDERGRADUATE MAJOR PROGRAM IN COGNITIVE SCIENCE

With the formation of the new Department of Cognitive Science, the previous cognitive science major within psychology is no longer in effect. Students who wish to major in cognitive science should see the catalog materials for that department. Students who began their cognitive science major prior to the 1989-90 year and wish to continue their major in psychology may do so. Additional information about either the cognitive science major from the Department of Cognitive Science or the cognitive science major within the Department of Psychology may be obtained from the office of the Department of Cognitive Science.

THE MINORS PROGRAM

THE NONCONTIGUOUS MINOR FOR REVELLE COLLEGE

Students may enroll in psychology courses in order to fulfill the requirements of the noncontiguous minor. The noncontiguous minor will normally consist of three of the lower-division courses in psychology and three courses selected from the upper-division offerings of the department. Please note carefully the prerequisites for the upper-division courses. Students who wish to pursue a noncontiguous minor should consult with one of the departmental undergraduate advisers before enrolling in these courses. Lower-division psychology courses may not be used simultaneously to satisfy both the social science requirement and the noncontiguous minor requirement.

MINOR PROGRAM FOR THIRD COLLEGE

Third College students may minor in psychology by completing a six-course sequence in psychology which must include at least three upper-division courses. At the beginning of their program planning, students should carefully examine the prerequisites for each of the courses to be used for the minor and consult with one of the departmental undergraduate advisers. Note in particular that introductory statistics (Psychology 60) is a prerequisite for almost all upper-division courses.

MINOR PROGRAM FOR WARREN COLLEGE

Warren College requires its students to complete two six-course sequences to fulfill the area-of-concentration requirements. Six of these twelve courses must be upper-division. A student may minor in psychology by choosing a six-course sequence, at least three courses of which must be upper-division.

TRANSFER CREDIT

In general, all introductory courses in scientific and/or experimental psychology are accepted for lower-division credit toward a psychology major or 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 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 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 five areas: cognitive (including attention, language, perception), developmental (including language acquisition), learning and behavior analysis (including basic and applied), sensory and physiological (including vision, audition and neurophysiology), and social (including health and law). The Graduate Affairs Committee provides an approved list of courses from these areas. In the first year of study, each student must fulfill the following four requirements:

1. Each student must fulfill a quantitative methods requirement, either by taking two quantitative methods courses approved by the Graduate Affairs Committee 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 students. *Part I* is the written examination. Each area within the department will be responsible for preparing a core list of readings that the members of the area feel ensures a comprehensive coverage of the main emphases of the field. At least 50 percent of this core list will be drawn from proseminar courses taken in the student's first year. All of the core readings will be available to graduate students at the end of their first year and will not be changed before their exam, in their third year. This list should contain the equivalent of approximately one major text and five review articles and will be updated at the beginning of each academic year.

There are seven areas that are possible options: cognitive, developmental, learning and behavior analysis, sensation and perception, social, physiological, and any outside area chosen by the student and approved by the graduate affairs committee. Each student will choose three of the seven areas in the department upon which to be examined. For each area, the student will be responsible for reading the core list of material plus additional material consisting of specialized papers in the area that are agreed upon by the student and his or her adviser and committee members. These additional readings should consist of approximately half again as much reading as on the area core list. The student will also prepare nine questions (three per area) upon which he or she may be examined. These questions must be approved by the student's committee.

The examination will consist of three sections, one section for each area. In each area two-thirds of the examination will be prepared by the members of the area, and one question (presumably constituting one-third of the exam) will come from the student's list of prepared questions. The selection will be made by the student's committee members. Examination questions that are prepared by the faculty members will not be made available prior to the exam; however, a list of sample questions in the same format as those to be included on the exam will be provided for students taking the exam the first year. Students will have fifteen hours in which to complete the exam. This time will be split across three days. One area will be covered each day. The examination will be a sit-down, closed-book exam given twice during the academic year, once in September and once in March. Students are required to take the exam at least once by the fall quarter of their third year. The three sections will be blind graded by two faculty members in each area. The student may retake any or all sections of the exam up to three times; however, if the student decides to take the exam during his or her fourth year, the exam will be covering different readings. The student has the option of substituting a different area.

If the student does not pass all three sections by the end of his or her third year, the student may take the exam up until the spring of his or her fourth year, but the student will not qualify for a fee waiver and will be assessed educational fees. No outside examiners are involved in this part of the examination.

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 assign-

ments 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.

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. (Not offered in 1993-94.)

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: Psych. 60.*

102. Introduction to Sensation and Perception (4)

An introduction to problems and methods in the study of perceptual and cognitive processes. *Prerequisite: Psych. 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: Psych. 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.

110A-B. Honors Seminar in Psychology (4-4)

This two-quarter sequence exposes honors students to contemporary research problems from all branches of experimental psychology. Weekly meetings consist of research seminars presented by different faculty members. Intensive reading and paper assignments are required. *Prerequisites: admission to Psychology Honors Program by application—a minimum overall GPA of 3.3 is required.*

111. Advanced Statistics (4)

Intermediate examination of the experimental method in psychology and mathematical techniques necessary for experimental research. *Prerequisite: minimum grade of B in either Psych. 60 or equivalent.*

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: Psych. 60 and 101.*

115. Laboratory in Cognitive Psychology (4)

Lecture and laboratory work in human information processing. *Prerequisites: Psych. 105 and 111 or consent of the instructor.*

116. Laboratory in Sensory Psychology (4)

An introduction to the experimental measurement and analysis of auditory and visual phenomena. *Prerequisites: Psych. 159 (co-registration permitted) and Psych. 111.*

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.*

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 Psych. 120.*

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: Psych. 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.*

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.*

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: Cog. Sci. 101B or Psych. 105 or Psych. 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.*

145. Psychology of Language (4)

This course will cover a number of basic research findings, theories, and issues concerning the recognition, comprehension, and production of language. *Prerequisite: Psych. 105.*

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)

General theory of judgment-decision based on cognitive algebra. Empirical applications across all areas of psychology. *Prerequisite: Psych. 104 or Psych. 105. (Not offered in 1993-94.)*

149. Social Psychology and Dramatic Arts (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: major in psychology, minor in theatre, or major in theatre, minor in psychology, or consent 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 Psych. 163 and consent of instructor.*

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: Psych. 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: Psych. 103 and/or Psych. 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: Psych. 60 or equivalent and Psych. 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: Psych. 60 and 101.*

158. Explorations of Human Nature (4)

Lecture and discussion on psychological, biological, and social constraints on human psychology, with special emphasis on consciousness and emotion and on topics in the evolution of mind and behavior. *Prerequisite: seniors majoring in psychology, anthropology, or philosophy.*

159. Physiological Basis of Perception (4)

A survey of sensory and perceptual phenomena with emphasis on the physiological mechanisms underlying them. *Prerequisite: Psych. 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 mem-

bers 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: Psych. 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.

164. The Regulation of Food Intake (4)

The course will cover the regulation of food intake from a physiological and behavioral point of view. Both the quantitative control of eating and specific appetites and pica will be discussed from an experimental point of view. *Prerequisites: Psych. 60 and 106.*

165. Explanation and Knowledge (4)

Discussion of psychological theory and evidence on such topics as epistemology, ordinary language, reasons and causes, existence, sociocultural determinants of thought, ethics. *Prerequisites: restricted to seniors and graduate students in anthropology, linguistics, philosophy, political science, psychology, and sociology; consent of instructor.*

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: Psych. 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.*

172A-B. Current Issues in Brain and Behavior (4-4)

For more than a century, debate has raged on the relation of physical (brain) events to mental life. This course will discuss current publications that relate to this debate. Although readings will span human and animal literature, emphasis will be on the more complex and cognitive aspects of human behavior. *Prerequisites: Psych. 106, or Psych. 189, or equivalent and consent 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 de-

termining 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.*

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 (Psych. 1, 2, 3, or 4) or upper-division standing.*

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, anti-anxiety 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.*

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.*

194A-B-C. Honors Thesis (4-4-4)

Students will take part in a weekly research seminar. In addition, they will plan and carry out a three-quarter research project under the guidance of a faculty member. The project will form the basis of their senior honors thesis. *Prerequisites: one laboratory course in psychology (Psych. 114 through 127), Psych. 111, 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 towards 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: Psych. 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. Quantitative Methods in Psychology (3-3)

An intensive course in statistical methods and the mathematical treatment of data, with special reference to research in psychology. *Prerequisite: restricted to graduate students in psychology.*

202. Sensory Mechanisms (4)

A survey of current problems in the analysis of sensory systems.

203. Physiological Psychology (3)

The central nervous system and its relation to behavior.

204. Social Psychology (3)

The behavior of man as a function of social variables. (Not offered in 1993-94.)

205. Cognitive Engineering (3)

Applied information processing psychology, emphasizing human-machine interaction. Development of formal principles of design based upon cognitive science. Topics include: principles of human-machine interaction, human and system-induced error, "friendly" systems, mental models and system images, moral implications, including the question of what tasks ought not be fully automated. (Not offered in 1993-94.)

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.

209A. Judgment and Decision Making (3)

General theory of judgment and decision making. Psychophysical judgment, social judgment, decision making, and rudiments of measurement theory. Primary emphasis on experimental applications. *Prerequisite: open to undergraduates with consent of instructor.* (Not offered in 1993-94.)

209B. Judgment and Decision Making (3)

General theory of judgment and decision. Primary emphasis on mathematical and statistical analysis of algebraic models, both for controlled experiments, and for observational field data. *Prerequisite: Psych. 209A.* (Not offered in 1993-94.)

210. Motivation and Learning (3)

Basic seminar on principles of human and animal motivation and learning. (Not offered in 1992-93.)

211. Piagetian Theory (3)

Selected topics in Piaget's theory of cognitive development. (Not offered in 1993-94.)

212A-B-C. Introduction to Visual Science I, II, & III (3-3-3)

Specification and measurement of the visual stimulus; introductions to basic physiological optics and visual neurophysiology. *Prerequisites: 212A; open to undergraduates with Psych. 159, 212B; open to undergraduates with Psych. 212A. 212C open to undergraduates with 212A and 212B.*

213. Systematic Issues in Psychology (4)

Selected historical and current topics will be discussed from competing theoretical perspectives.

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.

217. Proseminar in Cognitive Development (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.

218A-B. Cognitive Psychology (3-3)

A two-quarter survey of basic principles and concepts of cognitive psychology. This course is intended to serve as the basic introduction for first-year students. Basic areas include knowledge, memory, thought, perception, and performance. The areas are taught by those faculty members who work within the spe-

cially. *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.

221A. Sensory and Physiological Psychology I (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.

221B. Sensory and Physiological Psychology II (3)

Physiological mechanisms underlying vision, hunger and thirst, and the physiological bases of memory and learning.

222. Brain Functions (2)

Selected topics. Advanced seminar. (Not offered in 1993-94.)

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: Psych. 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. Advanced Topics in Human Information Processing (2)

Selected discussions of advanced topics. *Prerequisite: Psych. 205 or consent of instructor.* (Not offered in 1993-94.)

232. Advanced Topics in Human Social Behavior (3)

The course will cover topics in human social behavior, with special emphasis on recent developments in experimental and social psychology. Such topics as aggression, affiliation, and the relationship between self-reports and other behavior will be examined. *Prerequisite: consent of instructor.* (Not offered in 1993-94.)

233A-B. Topics in Learning and Motivation (3-3)

Advanced topics in learning and motivation, with special emphasis on current research. *Prerequisite: Psych. 210.*

RELIGIOUS STUDIES

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.* (Not offered in 1993-94.)

236. Neural Plasticity and Regeneration (3)

This seminar will cover topics related to neural plasticity in the mammalian nervous system. Current research on the structural changes that mediate functional recovery from injury will be emphasized.

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.

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. Advanced Topics in Psycholinguistics (3)

Research and discussion on selected topics in psycholinguistics. *Prerequisite: consent of instructor.*

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.*

253. Advanced Topics in Cognitive Decision Theory (3)

Research and discussion on selected topics in cognitive psychology. *Prerequisite: consent of instructor.*

254. Advanced Topics in Perception (3)

Research and discussion on selected topics in perception. *Prerequisite: consent of instructor.* (Not offered in 1993-94.)

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.*

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.

259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)

Advanced topics in comparative, cognitive research. (Not offered in 1992-93.)

260. Advanced Topics (2)

Advanced seminar on special topics in theoretical and experimental psychology. *Prerequisite: graduate student in psychology.*

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. *Prerequisites: 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.

264. Special Topics in Social Cognition (3)

Seminar on current theory and research on social perception, memory for social events and people, and attribution theory.

Open to graduates and advanced undergraduates. *Prerequisite: open to undergraduates with Psych. 147 or by consent of instructor.* (Not offered in 1993-94.)

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 Psych. 126 or Psych. 127 and consent of instructor.*

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.

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 permitted.) (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 permitted.) (F,W,S)

299. Independent Research (1-12)

Independent research and thesis research. (S/U grades permitted.) (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.)

RELIGIOUS STUDIES

Office: 4005 Humanities and Social Sciences Building, Muir College, 534-8849

Faculty

Henry E. Allison, *Philosophy*
Stanley A. Chodorow, *History*
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*
 James K. Lyon, *Literature*
 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; HILD 3A-B-C; HILD 4A-B-C; LTGN 19A-B-C; LTEN 21-22-23; Phil. 31-32-33; Soc/L 1A-B and ANLD 22; Fifth College Making of the Modern World; Revelle College Humanities; and Cultural Traditions 1A-B-C.

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

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).

MINOR

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).

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

RUSSIAN AND SOVIET STUDIES PROGRAM

- 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
 LTGN 159. Topics in the Sociology of Organizations and Institutions
 LTGN 120. Yiddish Literature in Translation
 LTGN 149. The Jewish Experience in Literature
 LTGN 155. Hebrew Literature: The Modern Period
 LTGN 181. Mythology
 LTGN 185. Literature and Ideas
 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

- 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. Arts 122A. Art of the Middle Ages
 Vis. Arts 122B. Renaissance Art
 Vis. Arts 123A. Italian Art of the Early Renaissance
 Vis. Arts 123B. High Renaissance Art
 Vis. Arts 123C. Michelangelo
 Vis. Arts 123F. Castles, Cathedrals, and Cities
 Vis. Arts 123H. Images of Women in Medieval and Renaissance Art
 Vis. Arts 123I. 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: Provost's Office Building, 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, 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. (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. (S)*

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. *Prerequisites: none. Pass/Not Pass grades only. (F,W,S)*

RUSSIAN AND SOVIET STUDIES PROGRAM

OFFICE: 7039 Humanities and Social Sciences Building, Muir College

Faculty

- Steven Cassedy, Ph.D., *Professor in Literature*
 Frantisek Deak, Ph.D., *Associate Professor in Theatre*
 Robert Edelman, Ph.D., *Associate Professor in History*
 Beth Holmgren, Ph.D., *Assistant Professor in Literature*
 Timothy McDaniel, Ph.D., *Professor in Sociology*
 Philip Roeder, Ph.D., *Assistant 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, his-

tory, and social science. No more than three of the six courses may be in the language. Knowledge of the language is not a requirement for the minor, but it is strongly recommended.

THE MAJOR

The major requires a study of Russian language. It consists of LTRU 1A-B-C (First-Year Russian), LTRU 2A-B-C (Second-Year Russian), or their equivalent, and a minimum of twelve upper-division courses. All students are required to take LTRU 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).

Courses

LITERATURE

- LTRU 1A-B-C First-year Russian (4-4-4)
 LTRU 2A-B-C Second-year Russian (4-4-4)
 LTRU 101A-B-C Advanced Russian (4-4-4)
 LTRU 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 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: 3045 Humanities and Social Sciences Building, Muir College

Professors

- Paul M. Churchland, Ph.D., *Philosophy*
 Gerald D. Doppelt, Ph.D., *Philosophy*
 Philip S. Kitcher, Ph.D., *Philosophy*
 Bruno Latour, Ph.D., *Sociology*; also *Centre de l'Innovation, Paris*
 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 Professor

- Robert Marc Friedman, Ph.D., *History*

Assistant Professor

- Sandra D. Mitchell, Ph.D., *Philosophy*

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. stu-

dents. 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

UPPER-DIVISION

181. Elements of International Medicine (4)

The sociocultural, economic, and geopolitical framework for the study and understanding of medical problems on a worldwide scale, and as basis for international health policy. Global patterns of disease, availability and needs for medical technology, and comparisons between diverse medical education and health care delivery systems abroad with those in the U.S. Students should be able to acquire an understanding of diverse determinants of disease, and of relationships between socioeconomic development and health. *Prerequisite: senior or graduate standing.* H. Simon

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 69
- 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*
- George E. Backus, Ph.D., *Geophysics*
- Jeffrey L. Bada, Ph.D., *Marine Chemistry*
- Wolfgang H. Berger, Ph.D., *Oceanography*
- Michael J. Buckingham, Ph.D., *Oceanography*
- Steven C. Cande, Ph.D., *Marine Geophysics*
- Harmon Craig, Ph.D., *Geochemistry and Oceanography*
- 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*
- 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*
- Edward D. Goldberg, Ph.D., *Chemistry*
- Robert T. Guza, Ph.D., *Oceanography*
- James W. Hawkins, Ph.D., *Geology*
- Walter F. Heiligenberg, Ph.D., *Behavioral Physiology*
- Myrl C. Hendershott, Ph.D., *Oceanography*
- Robert R. Hessler, Ph.D., *Biological Oceanography*
- William S. Hodgkiss, Ph.D., *Electrical Engineering*
- Nicholas D. Holland, Ph.D., *Marine Biology*
- Glenn R. Ierley, Ph.D., *Oceanography*
- Miriam Kastner, Ph.D., *Geology*
- Charles D. Keeling, Ph.D., *Oceanography*
- William A. Kuperman, Ph.D., *Oceanography*
- Devendra Lal, Ph.D., *Nuclear Geophysics*
- Peter F. Lonsdale, Ph.D., *Oceanography*
- J. Douglas Macdougall, Ph.D., *Earth Sciences*
- T. Guy Masters, Ph.D., *Geophysics*
- John A. McGowan, Ph.D., *Oceanography*
- 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*
- Robert Pinkel, Ph.D., *Oceanography*
- V. Ramanathan, Ph.D., *Geophysical Sciences*

Richard H. Rosenblatt, Ph.D., *Marine Biology, and Chair of the Department*
 Richard L. Salmon, Ph.D., *Oceanography*
 John G. Sclater, Ph.D., *Marine Geophysics*
 Richard C. J. Somerville, Ph.D., *Meteorology*
 Lynne D. Talley, Ph.D., *Oceanography*
 Victor D. Vacquier, Ph.D., *Marine Biology*
 Charles W. Van Atta, Ph.D., *Engineering Physics and Oceanography*
 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*
 Robert S. Arthur, Ph.D., *Oceanography, Emeritus*
 Andrew A. Benson, Ph.D., *Biology, Emeritus*
 Charles S. Cox, Ph.D., *Oceanography, Emeritus*
 Joseph R. Curray, Ph.D., *Geology, Emeritus*
 Seibert Q. Duntley, Sc.D., *Physics, Emeritus*
 Albert E. J. Engel, Ph.D., *Geology, 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*
 Ralph A. Lewin, Ph.D., Sc.D., *Biology, Emeritus*
 Walter H. Munk, Ph.D., *Oceanography, Emeritus*
 William A. Nierenberg, Ph.D., *Geophysics, Director, Emeritus*
 Melvin N. A. Peterson, Ph.D., *Oceanography, Emeritus*
 Fred B Phleger, Ph.D., *Oceanography, Emeritus*
 Russell W. Raitt, Ph.D., *Geophysics, 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*
 Benjamin E. Volcani, Ph.D., *Microbiology, Emeritus*
 Kenneth M. Watson, Ph.D. *Physical Oceanography, Emeritus*

Associate Professors

Ronald S. Burton, Ph.D., *Marine Biology*
 David M. Checkley, Ph.D., *Oceanography*
 Horst Felbeck, Dr. rer. nat., *Marine Biology*
 John A. Hildebrand, Ph.D., *Geophysics*
 Lisa A. Levin, Ph.D., *Oceanography*
 Jason Phipps Morgan, Ph.D., *Geophysics*
 Dean H. Roemmich, Ph.D., *Oceanography*
 David T. Sandwell, Ph.D., *Geophysics*
 Peter M. Shearer, Ph.D., *Geophysics*
 George Sugihara, Ph.D., *Mathematical Ecology*
 Lisa Tauxe, Ph.D., *Geophysics*

Assistant Professors

Douglas H. Bartlett, Ph.D., *Marine Microbiology*
 Kevin M. Brown, Ph.D., *Geology*

Paterno R. Castillo, Ph.D., *Geology*
 Christopher D. Charles, Ph.D., *Oceanography*
 Catherine G. Constable, Ph.D., *Geophysics*
 Peter J. S. Franks, Ph.D., *Oceanography*
 Margo G. Haygood, Ph.D., *Marine Biology*
 Timothy D. Herbert, Ph.D., *Geology, and Vice Chair of the Department*
 Ralph F. Keeling, Ph.D., *Geochemistry*
 Mark D. Ohman, Ph.D., *Oceanography*
 Brian Palenik, Ph.D., *Marine Biology*
 Robert E. Shadwick, Ph.D., *Marine Biology*
 Arthur J. Spivack, Ph.D., *Geochemistry*
 Wuchang Wei, Ph.D., *Oceanography*
 Bradley T. Werner, Ph.D., *Oceanography*

Professors-in-Residence

Farooq Azam, Ph.D., *Biology*
 William H. Fenical, Ph.D., *Chemistry*
 Gerald L. Kooyman, Ph.D., *Biology*

Adjunct Professors

Yehuda Bock, Ph.D., *Geophysics*
 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

Yaacov K. Bendor, Ph.D., *Research Geologist*
 Jonathan Berger, Ph.D., *Research Geophysicist*
 Angelo F. Carlucci, Ph.D., *Research Microbiologist*
 Jeffrey B. Graham, Ph.D., *Research Biologist*
 Edvard A. Hemmingsen, Ph.D., *Research Physiologist*
 Osmund Holm-Hansen, Ph.D., *Research Biologist*
 Robert A. Knox, Ph.D., *Research 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

Steven C. Constable, Ph.D., *Associate Research Geophysicist*
 Bruce D. Cornuelle, Ph.D., *Associate Research Oceanographer*
 Andrew G. Dickson, Ph.D., *Associate Research Chemist*
 Nicholas E. Graham, Ph.D., *Assistant Research Meteorologist*
 Alistair J. Harding, Ph.D., *Assistant Research Geophysicist*

Thomas L. Hayward, Ph.D., *Associate Research Oceanographer*
 Mark E. Huntley, Ph.D., *Associate Research Biologist*
 Jules S. Jaffe, Ph.D., *Assistant Research Oceanographer*
 Hubert Staudigel, Ph.D., *Associate Research Geologist*
 John A. Tarduno, Ph.D., *Assistant Research Geophysicist*
 Bradley M. Tebo, Ph.D., *Assistant Research Biologist*
 Spahr C. Webb, Ph.D., *Assistant Research Oceanographer*
 Mark A. Zumberge, Ph.D., *Associate Research Geophysicist*

Affiliated Faculty

Victor C. Anderson, Ph.D., *Professor, Emeritus, ECE*
 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, and applied ocean 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, 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, sulfur, nitrogen and other elements; isotopic geochemistry of the solid earth and meteorites; atmospheric trace gas chemistry; paleoatmospheric composition recorded in polar ice cores and in sediments; and chemistry of lakes and other freshwater 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 subprograms 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 multi-channel 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; experimental non-Newtonian 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, in-

cluding 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: deep circulation and deep fish populations; deep-sea autonomous vehicles, instruments, basic control devices, and special collecting gear; seismic surveys of the mantle; ocean bottom microseisms and crustal displacements associated with earthquakes; surveys of bathymetric-magnetic trends; design and construction of special purpose ocean vehicles (ships, submarines, platforms such as FLIP); remotely operated cable-connected vehicles and stations on the sea floor; sonar systems and sonar signal processing equipment; underwater lasers; remote sensing of sea-surface temperature, roughness, and marine resources from aircraft and orbital spacecraft; meteorology above the oceans; turbulent flows, formation of barrier beaches; mechanisms of currents, sand transport, and sediment transport in the surf zone, the shelf, and in submarine canyons; studies of air-sea interaction.

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. 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.

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 205A, 205B, 210, 240, 260, 270, 280, and one of 274, 283, 284, or 294A. Other course work ordinarily will be recommended by the student's advisory committee, usually including 278 (or equivalent) one quarter of each year 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, marine biology, biological oceanography, chemistry, and mathematics. There is no general language requirement: each candidate's doctoral committee will decide at the time of the qualifying examination whether there shall be a language requirement to be satisfied prior to the final examination, and if so, which language(s) will be acceptable.

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. Every student, however, will be required to have knowledge of one or more of the ocean sciences. 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 210, 211A-B-C, 212A-B, 214A-B, 220, 221, AMES 294A-B-C, 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 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.

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 examina-

tion 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

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)

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. Anderson, 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. Anderson, Hildebrand (W)

204C. Advanced Acoustics III (4)

Signal processing in underwater acoustics. Theory and hardware embodiments. *Prerequisite:* concurrent registration in ECE 145CL recommended; SIO 204B or consent of instructor. Anderson, Hildebrand (S)

205A. Applied Parametric Statistics (4)

Methods of parametric statistics with emphasis on those procedures particularly useful in field studies. Measures of central tendency and dispersion, testing for goodness of fit, hypothesis testing, analysis of variance, regression and correlation analysis, and circular statistics. Offered in alternate years. (S/U grades permitted.) Hodgkiss (W)

205B. 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 205A or equivalent parametric statistics courses. Offered in alternate

years. *Prerequisite: elementary statistics or consent of instructor.* Venrick (S)

207A. Digital Signal Processing I (4)

Sampling; A/D and D/A conversion, discrete linear system theory, z-transforms; digital filters, recursive and nonrecursive designs, quantization effects; fast Fourier transforms, windowing, high speed correlation and convoluting; discrete random signals; finite word length effects. *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)

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-C. Ocean Waves (4-4-4)

Propagation and dynamics of waves in the ocean including the effects of stratification, rotation, topography, wind, and non-linearity. *Prerequisites: for SIO 211B/C either 211A/B and SIO 214A or consent of instructor.* Young, Hendershott, Pinkel, Salmon, Guza (F,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 sat-

ellite 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)

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 210A.* (S/U grades permitted.) Roemmich (W)

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 (S)

222. Tensors in Geophysics (4)

Tensors as geometrical objects rather than arrays of components. Applications, depending on class background, chosen from among plate tectonics, earth rotation, tides, geomagnetism, continuum mechanics (stress, strain, constitutive relations, dislocations), seismic source theory, flow in porous media. *Prerequisite: consent of instructor.* (S/U grades permitted.) Backus (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)

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. Geomagnetism and Paleomagnetism (4)

A course describing the observations (field elements, internal sources, secular variations, reversals), theory (Maxwell's and Laplace's equations, spherical harmonics, rock magnetization, disk dynamos), measurements (paleomagnetic techniques, magnetometers, marine and satellite data), and resulting models (spherical harmonic field models, apparent polar wander, the magnetosphere and ionosphere). *Prerequisites: advanced calculus, differential equations, complex variables, and familiarity with Maxwell's equations, or consent of instructor.* (S/U grades permitted.) Backus, Parker, Tauxe (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)

235A-B. Geodesy (4-4)

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)

237. Geomagnetism (4)

Foundations of magnetohydrodynamics. Survey of dynamo theories. Mantle electromagnetism. Core-mantle coupling. Frozen flux and geostrophic hypotheses for secular variation. Use of satellite and surface data to test hypotheses and to estimate parameters (e.g., sunspot cycles, magnetic jerks, use of prior information). *Prerequisite:* SIO 229; *consent of instructor.* (S/U grades permitted.) Backus (S)

239. Special Topics in Geophysics (1-4)

Special course offerings by staff and visiting scientists. Example topics are seismic source theory, geophysical prospecting methods, dislocation theory and seismic mechanisms, tectonic interpretation of geodetic data, and dynamo theory. (S/U grades permitted.) Staff (F,W,S)

240. Marine Geology (4)

Introduction to the geomorphology, sedimentation, stratigraphy, vulcanism, structural geology, tectonics, and geological history of the oceans. *Prerequisites:* the physics and chemistry required for admission to the graduate curriculum in SIO, and ES 101 or equivalent, or *consent of instructor.* Staff (W)

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. Sedimentary Petrology (4)

Characteristics and origin of sediments and sedimentary rocks. *Prerequisite:* *consent of instructor.* Winterer (W)

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)

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; math 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)

250. Coastal Marine Geochemistry (4)

A survey of chemical reactions in estuaries, lagoons, and coastal marine waters. Fundamentals of river and ocean water chemistries. Coastal sedimentation processes. Geochronologies applicable to inshore systems. Goldberg (W)

251. Thermodynamics of Natural Processes (4)

Applications of thermodynamics to general problems in the earth sciences. Topics include chemical and phase equilibria in heterogeneous multicomponent systems; properties of substances at high temperatures and pressures; models for solid solutions and gaseous mixtures; phase equilibria in silicate melts; adiabatic and pseudo-adiabatic transport; steady-flow systems; closed and open system models of the atmosphere, oceans, and solid earth. *Prerequisites:* Chem. 102A or 202A, or Phys. 140, Math. 2D or equivalent. Craig (W)

252A. Nuclear Geochemistry (4)

Geochemistry of stable and radioactive isotopes, with emphasis on oceanic and atmospheric applications. Topics include mixing and circulation studies in the ocean, atmosphere-sea interaction, the carbon cycle, volcanic contributions to the atmosphere and ocean, isotope fractionation effects and stable isotope variations in minerals and rocks. *Prerequisites:* Mathematics 2D or equivalent, SIO 210. (S/U grades permitted.) Craig (W)

252B. 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)

252C. Isotope Geology (4)

Radioactive and stable isotope studies in geology, 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. *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. *Prerequisite:* physical geology; geochemistry, mineralogy, physical chemistry (may be taken concurrently). Hawkins (F)

254. Advanced Igneous Petrology (4)

The origin and evolution of igneous rocks is considered in terms of field and laboratory evidence. Experimental and theo-

retical 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. *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. Field Geology (4)

Geologic mapping of selected areas and preparation of geological reports. Field work is done on weekends in local areas. *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. *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: composition and chemical state of the atmosphere, basic thermodynamics and open systems, water and gas exchange with the ocean, isotope geochemistry of atmospheric gases, trace gases (CH₄, N₂O, etc.), rates of increase, and climatic effects, early history and chemistry of the atmosphere, introduction to photochemistry. (S/U grades only.) Craig (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 (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. 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. Marine Natural Products Chemistry (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.) Weiss (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. *Prerequisite: SIO 210A, 280, or consent of instructors.* McGowan, Mullin (W)

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. Topics in Community Ecology (4)

Maintenance of community structure, with special emphasis on the importance of competition, predation, energetics, and stability as they affect patterns of distribution and abundance; interrelationships between community structure and population phenomena such as trophic specialization, reproductive strategies, and life histories. Alternate years with 275B. *Prerequisite: consent of instructor; open to undergraduates.* (S/U grades permitted.) Dayton (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. *Prerequisite: consent of instructor; open to undergraduates.* (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)

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)

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, physi-

ology, 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.* Heiligenberg (F,W)

294A. 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)

294B. Seminar in Advanced Ichthyology (2)

Discussion of special topics related to ichthyology. *Prerequisite: graduate standing or consent of instructor.* (S/U grades only.) Rosenblatt (F)

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 (1-2)

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

25. Vietnamese Culture (4)

This course explores the historical and literary background of Vietnamese culture. *Prerequisites: none.* (W) (Not offered in 1993-94.)

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. 6A. (F,W,S)

SOCIOLOGY

OFFICE: 7009 Humanities and Social Sciences Building, Muir College

Professors

- Rae Lesser Blumberg, Ph.D.
- Aaron V. Cicourel, Ph.D.
- Bennetta Jules-Rosette, Ph.D.
- Richard P. Madsen, Ph.D.
- Timothy L. McDaniel, Ph.D., *Chair*
- Hugh B. Mehan, Ph.D.
- Chandra Mukerji, Ph.D.
- David P. Phillips, Ph.D.
- Michael S. Schudson, Ph.D.
- Andrew Scull, Ph.D.
- Steven A. Shapin, Ph.D.
- Carlos H. Waisman, Ph.D.

Associate Professors

- Stephen E. Cornell, Ph.D.
- Harvey Goldman, Ph.D.
- Jeffrey Haydu, Ph.D.
- Klatch, Rebecca E., Ph.D.
- Gershon Shafir, Ph.D.
- Kathryn A. Woolard, Ph.D.
- Leon Zamosc, Ph.D.

Assistant Professors

- Richard G. Biernacki, Ph.D.
- Lisa Catanzarite, Ph.D.
- Maria Charles, Ph.D.
- Juan Diez Medrano, Ph.D.
- Ivan T. Evans, Ph.D.
- Ali Gheissari, Ph.D.
- Martha Lampland, Ph.D.
- Akos Rona-Tas, Ph.D.
- Ricardo D. Stanton-Salazar, Ph.D.
- Christena Turner, Ph.D.

Associate Adjunct Professor

Mary L. Walshok, Ph.D.

Assistant Adjunct Professor

Yen Espiritu, Ph.D.

Emeritus

- Bennett M. Berger, 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, H&SS 7009, 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 adviser 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. If you declared your major prior to fall 1990, Sociology 10, 30, or 40 may be used to satisfy the third lower-division sociology course requirement for the major. If you did not declare your major until fall 1990, you are required to take Sociology 20, Social Change in the Modern World, to fulfill your lower-division requirements.

Upper Division

Twelve upper-division courses are necessary for the major—six are courses in required clusters, and the other six 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

Methods

103M, 104, 105, 106, 107, 108A, 108B, 109, 109S, 120

B. Culture, Language, and Social Interaction

(courses designated Soc/B)

111, 112, 113, 115, 116, 117, 118, 120S, 131, 137, 142, 143, 160, 161, 162, 164J, 166, 167, 170, 172, 173, 174, 176, 177, 178

C. Organizations and Institutions

(courses designated Soc/C)

121, 122, 123, 124, 125, 126, 129, 130, 135, 136A, 136B, 140, 141, 144, 148, 148C, 148E, 148I, 148L, 149, 150, 150L, 151M, 152, 156, 157, 159, 165A/B, 168E, 168J, 168S, 175G, 180

D. Comparative and Historical

(courses designated Soc/D)

120W, 133, 151, 158, 158J, 168, 179, 181, 181I, 182, 183S, 184, 185, 186P, 187, 187S, 188A, 188B, 188D, 188E, 188F, 188G, 188H, 188I, 188J, 189

All students must complete Sociology 100. (Students are *strongly* advised to take Sociology 100 in their junior year.) In addition, *two* other courses are required from the **Theory and Method** cluster (Soc. 101 to 109), at least one of which must be in methods. *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. Before graduating, students must show the undergraduate coordinator (in the Main Office) three 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 three 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.

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 adviser 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. 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 adviser 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 GRADUATE PROGRAM

The Department of Sociology offers a course of study leading to the doctor of philosophy degree. The department is predominantly qualitative and concentrates on three main areas:

1. **Comparative and Historical Sociology.** Faculty members have done research on India, Japan, China, Spain, Hungary, Britain, pre- and post-revolutionary Russia, the Middle East, South Africa, and several Latin American countries, as well as the United States. Substantive topics have included socioeconomic and sexual stratification, class structure, theories of development, the relationship of ideology to social change, economic organization, the origins of the modern penal system, comparative social movements, and the methodology of comparative historical research.
2. **Sociology of Culture** (both mass culture and high culture). Our faculty study cultural systems in Europe, the Middle East, the United States, Central and South America, Eastern Europe, Japan, China, and Africa. The department offers courses in popular culture, mass media, ethnographic film, and the sociology of the arts, literature, film, and intellectual life.
3. **Interactional Sociology.** The department offers courses on symbolic interaction, sociolinguistics, cognitive sociology, ethnomethodology, and the sociology of everyday life.

The goal of the program is to prepare students to advance the discipline of sociology through creative research and scholarship. Students interested in an interdisciplinary Ph.D., with a concentration in sociology, can refer to the Program in Comparative Studies in Language, Society, and Culture.

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) and a confidential financial statement. Applicants are encouraged to visit the department to talk with faculty and graduate students. The application deadline is 15 January.

PROGRAM OF STUDY

Programs of study are determined in consultation with the graduate adviser, who supervises the work of students until their doctoral committees have been established. During the first three quarters, students fulfill the basic requirements of the core curriculum. Once fulfilled, students may vary their courses to suit individual interests.

Graduate students who have received either a master's degree or its equivalent from other universities may petition to omit core curriculum courses that appear to repeat work they already have completed successfully. Generally petitions requesting course exemptions are submitted after the student has arrived on campus.

THE CORE CURRICULUM SEQUENCE

The "core curriculum" is a group of courses covering the history of sociological theory and styles of sociological analysis. The core curriculum is designed to introduce graduate students to some of the major issues in sociological theory and method.

In addition to courses in classical sociological theory and styles of sociological analysis, the first-year cohort takes "Orientation to Faculty." 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

A committee composed primarily of the core curriculum faculty will evaluate first-year students on the basis of their performance in their first-year core curriculum courses. Results of the evaluations will be communicated to students in writing. The committee will either establish the student is in good standing, recommend additional course work, or recommend dismissal. In addition, the committee may wish to meet with some students in person to discuss the 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. The committee awards four possible grades: High Pass, Pass, M.A. Only, and Non-pass. All passing students receive the M.A. degree; those who obtain High Pass and Pass proceed toward the doctorate; M.A. Only students receive the degree but cannot continue toward the Ph.D.; those receiving Non-pass are asked to withdraw.

REQUIREMENTS FOR THE ORAL QUALIFYING EXAMINATION

Students spend the second year broadening their knowledge of different fields of interest and exploring ideas for their dissertations. Prior to the oral qualifying exams, students are required to take six substantive seminars, at least four of which must be taken for a letter grade. With the approval of the graduate adviser, one of these may be in a related discipline. It is also recommended that students take courses outside the department in order to broaden their knowledge of fields related to sociology.

Upon completion of the core curriculum, the six elective seminars, and the submission of three qualifying papers, students will be eligible to take the qualifying examination. Guidelines for qualifying papers and the qualifying examination may be obtained at the Sociology Graduate Office. The examination will cover three fields of research. These three fields, to be selected by the student, should be 1) broad, 2) distinct, and 3) generally recognized subdisciplines in sociology. Mastery of the fields should equip the student to teach three upper-division courses in sociology. The fields selected by the student must be approved by the Graduate Program Committee.

Faculty members conducting the qualifying examination will be chosen by the student according to procedures determined by university policy and by department resolutions. In general these faculty members will also guide the student through his or her doctoral dissertation. For this reason, faculty members conducting the qualifying exams are formally known as the doctoral committee.

According to university policy, the doctoral committee consists of at least five members; three of these are from the sociology department,

the remainder from another department or departments. The composition of the doctoral committee must be approved by the chair of the Department of Sociology and the dean of Graduate Studies and Research.

For the study of each field, the student will prepare a reading list, which must be approved by the sociology faculty members of the student's committee. In general, this reading list will consist of about twenty-five books and/or articles and will include the major works in the sub-discipline.

For each of the three fields, the student will write a paper, whose length will vary depending on the field. The papers should show a command of the major concepts, debates, and concerns in each of the three fields. The typical paper will be a review of the literature, but one paper may be a substantive paper displaying a broad knowledge of the field.

ORAL QUALIFYING EXAMINATION

The oral qualifying examination will be conducted by the student's doctoral committee. The aim of the examination is to test the student's knowledge of three areas of specialization, and his or her readiness to undertake research in these areas.

The department expects students to pass the oral qualifying examinations no later than the end of the third year of graduate study. The performance of those students who fail to do so will be reviewed by the Graduate Program Committee, which will set a deadline by which the examination must be completed if the student is to remain in the program. After passing the qualifying examination, the student advances to candidacy for the Ph.D. degree.

DISSERTATION PROPOSAL

By the end of the student's fourth year in the program, the student must have a dissertation program approved by his or her committee. Guidelines for the dissertation proposal are available in the Sociology Graduate Office. Approval must be obtained by the student at a formal proposal hearing before his or her doctoral committee.

DISSERTATION RESEARCH AND PREPARATION

The nature and requirements of dissertation research vary greatly depending upon the specific problem chosen. Once the student's doctoral committee has approved the dissertation proposal the student is ready to begin research and writing. Throughout the research and writing

phase of the student's graduate career, he or she should consult frequently with the committee. When the dissertation is substantially completed, copies are distributed to the committee four to six weeks prior to the proposed defense date. After reading the draft, the committee meets without the student to discuss it, then notice is given to the student of any changes required. The actual dissertation defense takes place at least one month after the preliminary meeting, after any changes are made. The final dissertation must be approved by each member of the doctoral committee and filed with the university librarian. Acceptance of the dissertation by the librarian represents the final step in completing all the requirements for a doctor of philosophy degree.

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.

PROGRAM IN SCIENCE STUDIES

The graduate Program in Science Studies is an interdisciplinary doctoral program offered collaboratively by the Departments of Sociology, History, and Philosophy. The program is designed to introduce students to historical, sociological, and philosophical approaches to the understanding of scientific knowledge, and to encourage them to explore the ways in which various traditions arising from those three disciplines might be integrated into a single framework for understanding the scientific enterprise past and present. The core of the program is a weekly seminar, led by faculty from all three departments, in which both classic and recent works in the science studies disciplines will be analyzed and discussed, and in which faculty and students may also present their current work for discussion and criticism. Students will also have to take graduate seminars in all three disciplines.

For more information on the Program in Science Studies, see the coordinator in the Science Studies Office, H&SS 3045.

CONCENTRATION IN COMPARATIVE INSTITUTIONAL AND CULTURAL TRANSFORMATIONS

In addition, the department offers a graduate concentration in comparative institutional and cultural transformations. This concentration pro-

vides an intellectual and curricular framework for 1) the study of institutional change, both contemporary and historical, in a wide array of societies, and 2) the study of collective identities and the relationship between collective identity and institutional change.

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. Will satisfy theory requirement in Cluster A.*

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. *Prerequisites: upper-division standing. Will satisfy theory requirement in Cluster A.*

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. Will satisfy theory requirement in Cluster A.*

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. Will satisfy theory requirement in Cluster A.*

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. Will satisfy theory requirement in Cluster A.*

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. Will satisfy theory requirement in Cluster A.*

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 considera-

tion 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 confrontation 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. Introduction to Sociolinguistics (4)

Investigation of the fundamental relations between the forms of language and other aspects of human social order. Special emphasis is given to the interaction between selected modes of language investigations and theories of social cognition and behavior. *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 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. (Not offered in 1993-94.)*

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 137. Alcohol and Society (4)

The purpose of this course is to give the student an overview of the multitude of problems and the complex issues connected with the manufacture, sale, and consumption of alcohol. The course will be divided into three parts: 1) the positive and negative physiological, psychological, and social effects of alcohol consumption; theories of alcoholism causation; 2) microsociology of alcoholism—interaction of alcoholics with relatives, friends, treatment professionals; 3) macro-sociology of alcohol (manufacture, sale, consumption)—effects on society of alcoholism, the development of alcohol policies and their assessment. *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, stig-

matization 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)

(Same as Com/Cul 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/L 1A or consent of instructor.*

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)

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 124. Occupations and Professions (4)

Analysis of the social organization of work in modern societies, the concept of career, the development of professionalization. Occupational subcultures; work, leisure and alienation; social relationships of work groups in organizations; human relations in work situations; professional and occupational associations. Prospects for the humanization of work: democratization, derationalization, deprofessionalization. Change and conflict in contemporary occupations and professions. *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 135. Medical Sociology (4)

A selective inquiry into the roles of culture, social structure, and organized health professions for defining, mediating, and structuring the health and illness experiences of key social groups in American society. *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 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 149. Theory of Social Problems (4)

Structure and process by which situations become public issues; analysis of movements to criminalize or decriminalize, such as abortion, homosexuality, alcohol consumption, gambling, pornography, prostitution. Development of conflict and consensus of public issues; shifts between public and private problems. *Prerequisites: Soc/L 1A and 1B.*

Soc/C 150. Equality and Inequality (4)

Equality and elitism as persistent issues in modern societies. Materials from philosophy, history, and social sciences are used to define and describe current arguments and existing patterns of political power, popular and high culture, educational equality, and the distribution of income. *Prerequisite: upper-division standing.*

Soc/C 150L. The Politics of Language and Ethnicity (4)

This course 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 action 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 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 168. Cultures and Civilizations (4)

Comparative perspectives on the influence of religious, economic, and geographical factors in accounting for the different courses of development of world historical civilization. *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

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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 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 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.*

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 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.

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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 214. Social Psychology (4)

Emphasis in this seminar is two-fold: 1) ways in which the sociologists' approach to social psychology can be used to guide data collection and analysis in numerous areas of investigation; and 2) a critical appraisal of alternative theories of the interaction between the individual and society, as well as possible conceptual rapprochement among them.

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 219. Symbolic Interactionism (4)

A review and analysis of the philosophic grounding of symbolic interactionism in American pragmatism; its development in American sociology as exemplified in the writings of G.H. Mead, Blumer, and R.S. Peribanayagam; its relationship to other interpretive sociologies.

Soc/G 220. Deviant Behavior (4)

A critical comparison of current theories of deviant behavior, their application to the variety of such behaviors, as well as their historical antecedents. Also covered will be the political aspects of deviant designation, the creation of deviant subcultures, as well as interaction within them and with the larger society.

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 230. Advanced Studies in Contemporary Theory, Part I (4)

The first week of this seminar would be devoted to Parsons and would continue with various American theorists (including Coser, Homans, and Blumer) and the work of Dahrendorf. Such contemporary European theorists as Habermas, Luhmann, Turin, and maybe Giddens will be included in the study as well as several contemporary American neo-Marxists.

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. 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/G 240. Ethnomethodology (4)

Topics will include the philosophical origins of ethnomethodology as a social perspective; the epistemological basis of interactional approaches to social behavior in sociology and related disciplines; the role of language use in social contexts; forms of common sense reasoning in everyday life; the interpretation of normative rules; the interaction of different modes of reasoning in particular social settings.

Soc/G 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 materials as they apply to the study of social interaction and organization structures.

Soc/G 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (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 organization settings.

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 LR/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 250. Marriage, Family, and Relations between the Sexes (4)

Theory, research methods, and micro and macro research findings in the family field as they relate to other substantive areas in sociology. Special consideration given current concerns — sex roles, aging, and alternative life-styles.

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 preconditions, 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. *Prerequisites: 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 270. The Sociology of Education (4)

A consideration of the major theories of schooling and society, including functionalist, conflict, critical and interactional; se-

lected 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 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 preliminary presentations. Student projects will be based on videotape of actual classrooms whenever possible.

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 277. The Sociology of Technology (4)

Social theory has been largely uninterested in technology. 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.

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 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.)

▼ **SPANISH LITERATURE**

See Literature.

▼ **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

▼ **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."

TEACHER EDUCATION PROGRAM

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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.

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TEACHER EDUCATION PROGRAM

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OFFICE: Building 519, Fifth College

Professors

Richard C. Atkinson, Ph.D., *Professor of Psychology, Chancellor*

Aaron Cicourel, Ph.D., *Professor of Sociology*

Michael Cole, Ph.D., *Professor of Psychology and Communication*

Charles Cooper, Ph.D., *Professor of Literature*

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*

Marcelo M. Suarez-Orozco, Ph.D., *Assistant Professor of Anthropology*

Olga Vasquez, Ph.D., *Assistant Professor of Communication*

Senior Lecturer with Security of Employment

Randall Souviney, Ph.D., *Associate Coordinator, Teacher Education*

Lecturers

Victor Cifarelli, Ph.D., *Lecturer, Teacher Education*

Kim A. Cooley, M.A., *Lecturer, Supervisor, Teacher Education*

Winfield Cooper, M.A., *Lecturer, Supervisor, Teacher Education*

Rafael Hernandez, M.A., *Lecturer, Supervisor, Teacher Education*

Tom Humphries, Ph.D., *Lecturer, Teacher Education*

Joan Janis, M.A., *Lecturer, Supervisor, Teacher Education*

Cynthia Lawrence-Wallace, Ph.D., *Lecturer, Supervisor, Teacher Education*

Paula F. Levin, Ph.D., *Graduate Adviser and Lecturer, 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 Credential (with the option for the Bilingual Cross-Cultural Emphasis in Spanish) for elementary school teachers and the Single Subject Credential in English, mathematics, physical and life sciences for secondary school teachers.

If we receive expected approval from the California Commission on Teacher Credentialing, all TEP credentials completed on or after spring 1994 will have the new second language acquisition emphasis, the Crosscultural, Language and Academic Development Emphasis (CLAD), and the option of the bilingual CLAD (BCLAD) in Spanish.

A primary focus of the Teacher Education Program is multicultural education. We require applicants to have mastered the subject matter that they intend to be teaching; then as TEP students they will develop a repertoire of teaching practices to take advantage of the diversity of students in elementary and secondary schools. Our students become familiar with the impact that culture, social structure, and technology have on the education of the students they teach. We examine the cultural context of schooling—comparing the implicit cultural and linguistic demands of the school setting with those of the community and workplace. Our prospective teachers will construct learning environments in which their students' cultural knowledge and language are used as valuable educational resources.

Both the Multiple Subject and Single Subject credential programs consist of a Prerequisite Component and a Professional Preparation Component. Students will complete a total of six Ed-

ucation Foundation courses during the Prerequisite Component.

UCSD undergraduates may take these courses as a minor in teacher education during the bachelor's degree at UCSD.

Those who have already completed a bachelor's degree will apply to be admitted as prerequisite graduate students at TEP for the *one year* long Prerequisite Component. Applications to the *Graduate Prerequisite Component* are due by June 30, 1994, for admission to the prerequisite programs in fall 1994.

Upon completion of the Prerequisite Component (and a bachelor's degree, if not already completed), students apply for admission to the Professional Preparation Component, which consists of one year of full-time graduate study. Applications to the Professional Preparation Component are due by April 1, 1994, for admission to the professional program in fall 1994.

Further information regarding admission requirements and programs of study is given below for each of the credential programs offered by the Teacher Education Program.

THE MULTIPLE SUBJECT CREDENTIAL PROGRAM (for teaching grades K-6)

SELECTION OF TEACHER CANDIDATES

Admission to the Prerequisite Graduate Component*

The following are the eligibility requirements for admission to the Prerequisite Graduate Component* of the Multiple Subject Credential Program:

1. B.A. or B.S., with a major field of study equivalent to one offered at UCSD; or a B.A. or B.S. from another University of California Campus. A 3.0 cumulative GPA is required from the school awarding the bachelor's degree.
2. Subject Matter Competence: This requirement is satisfied by **either** (a) providing evidence of registration for, or satisfactory completion of, the Multiple Subjects Assessment for Teachers (MSAT), **or** (b) having completed four-fifths of the subject matter waiver for the multiple subject credential (also see "Subject Matter Competence" below).
3. The California Basic Skills Test (CBEST) This requirement is satisfied by providing evidence of having passed the CBEST.

* (UCSD undergraduates may register for TEP prerequisite courses simply by obtaining department approval—they are not admitted to the prerequisite program.)

The following will also be considered as the selection committee reviews application files:

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 in multicultural settings.
3. Involvement in public service activities.

The Prerequisite Component courses and course schedule are outlined in Table 1 below, and detailed in #4. *Education Foundations Sequence* in the next section.

TABLE 1

**The Prerequisite Component
(Education Foundations Sequence)**

The following grid will help you plan your prerequisite program. Course schedule is subject to change.

Suggested Course of Study

FALL	WINTER	SPRING
TEP 181A	TEP 181B	TEP 181C
TEP 117*	TEP 172*	TEP 126*

*Also see additional options under #4 below.

**Admission to the Professional
Preparation Graduate Component**

Students apply during the winter quarter of their senior (or graduate prerequisite) year to begin the program the following fall quarter. The application deadline is **April 1**. 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 insures that applicants have completed the requirements for admission listed in the next section, and then 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 in multicultural settings;
3. Involvement in public service activities;
4. Academic excellence in their undergraduate (and graduate if applicable) studies.

**Eligibility Requirements for the Professional
Preparation Component**

Before admission to the professional preparation component, students must complete the following requirements.

1. B.A. or B.S., with a major field of study equivalent to one offered at UCSD (*some examples of majors NOT eligible*: business/education/liberal studies/marketing/recreation); or a B.A. or B.S. from another University of California campus. A 3.0 cumulative GPA is required from the school awarding the bachelor's degree.
2. Subject Matter Competence: This requirement is satisfied by **either** (a) providing evidence of registration for, or satisfactory completion of, the Multiple Subjects Assessment for Teachers (MSAT), **or** (b) having completed four-fifths of the subject matter waiver for the multiple subject credential (also see "Subject Matter Competence" below).
3. The California Basic Skills Test (CBEST) This requirement is satisfied by providing evidence of having passed the CBEST.
4. Education Foundations Sequence/Prerequisite Component (grades of B or higher required)
 - a. TEP 181A-B-C (Practicum in Learning). TEP 121 (Public Service: Practicum in Learning) may substitute for TEP 181A, with instructor approval.
 - b. One of the following courses or its equivalent: TEP 172 (Child Development and Education), Psychology 101 (Introduction to Developmental Psychology), or TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning). TEP 172 is recommended.
 - c. One of the following courses or its equivalent: TEP 117 (Language, Culture, and Education) *or* Anthropology 143 (Education and Culture) *or* Comm/Hip 122A *or* 122B (Communication and the Community).
 - d. One of the following courses or its equivalent: TEP 126 (Social Organization of Education) *or* Sociology 150L (The Politics of Language and Ethnicity).

See Table 1 above for scheduling information.

5. Portfolio Requirement Applicants must submit a portfolio of work from TEP 181A-B, as outlined in the application instruction packet available from the TEP office.
6. Interview Applicants will be interviewed in early May by a panel of TEP faculty and school district personnel, with special attention to the four criteria listed above.

7. Prerequisites for BCLAD Emphasis in Spanish (if desired): This emphasis is designed for students who can teach in Spanish and English. Students interested in applying for admission to the BCLAD program must demonstrate:

- a. Spanish language fluency:
 - i) Completion of two Spanish literature courses, at least one of which must be upper division in either Latin American or Chicano literature, and
 - ii) Completion of a bilingual competency exam in Spanish coordinated by TEP (contact TEP in January prior to your application to the Credential Year).
- b. One history course *and* one culture course covering Chicano or Latin American-related topics.
- c. A willingness to teach in a bilingual setting.

**Final Selection Process for the Professional
Preparation Component**

The TEP Admissions Committee will utilize both written and oral assessment to reach final admissions decisions. Written assessment will consist in reviewing the applicant's academic performance, references, and portfolio of work. Oral assessment will be focused on the interview committees' evaluation of the applicants.

Subject Matter Competency

Credential candidates must demonstrate competency in the breadth of knowledge required to teach the diversified content areas in elementary school curricula. They may do this by passing the Multiple Subjects Assessment for Teachers exam administered by Educational Testing Service (National Teachers Exam) or by completing an approved subject matter waiver program for the Multiple Subject Credential.

For more information regarding UCSD's subject matter waiver programs, contact the TEP office.

PROFESSIONAL PREPARATION

The Multiple Subject Credential Program consists of professional preparation courses and fifteen weeks of student teaching, all taken at the graduate level.

- The professional preparation courses are:
- TEP 160 (Teaching the English Language Learner)
 - TEP 162 (Computer Applications in Teaching and Learning)
 - TEP 177 (Health Education)
 - TEP 178 (Mainstreaming Special-Needs Students)

TEP 191A-B-C (Innovative Instructional Practices)

TEP 192A-B (Bilingual Instruction Practices—BCLAD Students only)

TEP 193 (Multicultural Education)

Pre-student teaching in fall is offered as TEP 190. Student teaching in winter and spring is offered as TEP 180A and 180B (Practicum in Student Teaching). Students pursuing the BCLAD emphasis in Spanish must also take TEP 192A-B (Bilingual Instructional Practices). Students are also required to complete the U.S. Constitution requirement prior to completion of the program (satisfied through course work or examination). A typical student schedule for the professional preparation program is shown in Table 2:

TABLE 2

The Professional Preparation Program for the Multiple Subject Credential

Course schedule is subject to change.

FALL	WINTER	SPRING
TEP 162	TEP 191B	TEP 191C
TEP 191A	TEP 178	TEP 180B
TEP 193	TEP 180A	TEP 177
TEP 190 (3-unit practicum)	(TEP 192B—BCLAD)	
TEP 160 (TEP 192A—BCLAD)		

THE SINGLE SUBJECT CREDENTIAL PROGRAM (for teaching grades 7-12)

TEP offers Single Subject Credentials in English, mathematics, physical and life sciences for secondary school teachers.

SELECTION OF TEACHER CANDIDATES

Admission to the Prerequisite Graduate Component*

The following are the eligibility requirements for admission to the Prerequisite Graduate Component* of the Single Subject Credential Programs:

1. 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 majors; all English majors

Mathematics: all mathematics majors; majors equivalent to any UCSD engineering major, com-

* (UCSD undergraduates register for TEP prerequisite courses simply by obtaining department approval—they are not admitted to the prerequisite program.)

puter science major, or quantitative economics and decision sciences major

Physical or Life Science: all majors in the natural sciences (*excludes* psychology)

A 3.0 cumulative GPA is required from the school awarding the bachelor's degree.

2. Subject Matter Competence:

This requirement is satisfied by **either** (a) providing evidence of registration for, or satisfactory completion of, one of the following Specialty Area Tests of the National Teachers Exams, and the corresponding CAPA exam: English; Mathematics; Biology and General Sciences; or Chemistry, Physics, and General Sciences; **or** (b) having completed four-fifths of the subject matter waiver for the appropriate single subject credential (also see "Subject Matter Competence" below).

3. The California Basic Skills Test (CBEST)

This requirement is satisfied by providing evidence of having passed the CBEST.

The following will also be considered as the selection committee reviews application files:

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 in multicultural settings.

3. Involvement in public service activities.

The Prerequisite Component courses and course schedule are outlined in Table 3 below and are detailed in #4. *Education Foundations Sequence* in the following section.

TABLE 3

The Prerequisite Component (Education Foundations Sequence)

The following grid will help you plan your prerequisite program. Contact the TEP office for additional scheduling information.

Suggested Course of Study

FALL	WINTER	SPRING
TEP 171A	TEP 171B	TEP 171C
TEP 117*	TEP 196*	TEP 126*

*Also see additional options under #4 below.

Admission to the Professional Preparation Graduate Component (Internship Program)

Students apply during the winter quarter of their senior year to begin the program summer quarter. The application deadline is **April 1**. Applicants interested in financial aid should apply

as soon as possible, preferably by February 15, and contact Student Financial Services at (619) 534-3807. Those admitted to the Single Subject Credential Program will be interviewed in June and July for a paid internship for the following school year, in a local middle or high school. 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.

Each prospective candidate is carefully reviewed for admission by a committee composed of faculty and local public school educators, including TEP graduates. The selection committee insures that applicants have completed the requirements for admission listed in the next section, and then 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 in multicultural settings;

3. Involvement in public service activities;

4. Academic excellence in their undergraduate (and graduate if applicable) studies.

Eligibility Requirements for the Professional Preparation Component

Before admission to the professional preparation component, students must complete the following requirements.

1. 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 majors; all English majors

Mathematics: all mathematics majors; majors equivalent to any UCSD engineering major, computer science major, or quantitative economics and decision sciences major

Physical or Life Science: all majors in the natural sciences (*excludes* psychology)

A 3.0 cumulative GPA is required from the school awarding the bachelor's degree.

2. Subject Matter Competence:

This requirement is satisfied by **either** (a) providing evidence of registration for, or satisfactory completion of, one of the following Specialty Area Tests of the National Teachers Exams and the corresponding CAPA exam: English Language and Literature; Mathematics; Biology and General Sciences; or Chemistry, Physics, and General Sciences; **or** (b) having completed four-

fifths of the subject matter waiver for the appropriate single subject credential (also see "Subject Matter Competence" below).

3. The California Basic Skills Test (CBEST) This requirement is satisfied by providing evidence of having passed the CBEST.

4. Education Foundations Sequence/Prerequisite Component (grades of B or higher required)

- a. TEP 171A-B-C (Practicum in Learning). Enrollment in TEP 171C is limited to those students concurrently applying to the Internship Program.
- b. One of the following courses or its equivalent: TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning) [TEP 196 should be taken concurrently with either TEP 171A, B or C.], or TEP 172 (Child Development and Education), or Psychology 101 (Introduction to Developmental Psychology).
- c. One of the following courses or its equivalent: TEP 117 (Language, Culture, and Education) or Anthropology 143 (Education and Culture) or Comm/Hip 122A or 122B (Communication and the Community).
- d. One of the following courses or its equivalent: TEP 126 (Social Organization of Education) or Sociology 150L (The Politics of Language and Ethnicity).

See Table 3 above for scheduling information.

5. Portfolio Requirement

Applicants must submit a portfolio of work from TEP 171A-B, as outlined in the application instruction packet available from the TEP office.

6. Interview

Applicants will be interviewed in early May by a panel of TEP faculty and school district personnel, with special attention to the four criteria listed above.

7. Prerequisites for BCLAD in Spanish (if approved by CA—contact TEP office):

This emphasis is designed for students who can teach in Spanish and English. Students interested in applying for admission to the BCLAD program must demonstrate:

- a. Spanish language fluency:
 - i) Completion of two Spanish literature courses, at least one of which must be upper division in either Latin American or Chicano literature, and
 - ii) Completion of a bilingual competency exam in Spanish coordinated by TEP.
- b. One history course and one culture course covering Chicano or Latin American-related topics.
- c. A willingness to teach in a bilingual setting.

Final Selection Process for the Professional Preparation Component

The TEP Admissions Committee will utilize both written and oral assessment to reach final admissions decisions. Written assessment will consist in reviewing the applicant's academic performance, references, and portfolio of work. Oral assessment will be focused on the interview committees' evaluation of the applicants.

Subject Matter Competency

Credential candidates must demonstrate competency in the area in which they will receive their credential(s). Candidates will receive a teaching credential in every area in which they demonstrate competence. They may do this by passing one of the following Specialty Area Tests of the National Teachers Exams (passing scores in parentheses) and the corresponding CAPA exam: English Language and Literature (620); Mathematics (630); Biology and General Sciences (680); or Chemistry, Physics, and General Sciences (630).

As an alternative to the National Teachers Exam, the Teacher Education Program offers a subject matter waiver program for english, mathematics, physical and life sciences. Successful completion of an approved subject matter waiver program "waives" the requirement to pass the corresponding National Teachers Exam/CAPA. For more information regarding UCSD's Subject Matter Waiver programs, contact the TEP office.

PROFESSIONAL PREPARATION PROGRAM FOR THE SINGLE SUBJECT CREDENTIAL

Once students are selected, they are provided an intensive program of professional preparation, including a full-time summer program of teaching methods courses. Seminars offered in the evening throughout the year address classroom management, theories of teaching and learning, educating special-needs students, and advanced teaching practices.

The professional preparation program for the Single Subject Credential consists of the following courses in addition to the Internship Field Experience (TEP 170A-B-C).

- TEP 160 (Teaching the English Language Learner)
- TEP 162 (Computer Applications in Teaching and Learning)
- 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)
- TEP 177 (Health Education)
- TEP 178 (Mainstreaming Special-Needs Students)
- TEP 192AB (Bilingual Instructional Practices—BCLAD Students Only)
- TEP 193 (Multicultural Education)

*Only one of TEP 173, TEP 174, or TEP 175 is required.

Students are also required to satisfy the U.S. Constitution requirement, through course work or examination, prior to completing the professional preparation program.

A typical student schedule for the professional preparation program is shown in Table 4.

TABLE 4

The Professional Preparation Program for the Single Subject Credential

Course schedule subject to change.

SUMMER	FALL	WINTER	SPRING
TEP 162	TEP 170A	TEP 170B	TEP 170C
TEP 173/ 174/175	TEP 176	TEP 160 (TEP 192A— BCLAD)	TEP 178 (TEP 192B— BCLAD)
TEP 177			
TEP 193			

THE EDUCATION MINOR

TEP offers a minor in education. No courses for the minor may be taken on a Pass/No Pass basis. The minor consists of six courses (twenty-four units total) and can be fulfilled in either of two ways:

1. **Minor in Teacher Education** (limited to students preparing to apply to the credential program)

Required courses:

- a. TEP 181A-B-C (Practicum in Learning) or TEP 171A-B-C (Pre-Internship Practicum in Learning). Enrollment in TEP 171C is limited to those students concurrently applying to the TEP Internship Program.
- b. One of the following courses: TEP 172 (Child Development and Education), Psychology 101 (Introduction to Developmental Psychology), or TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning). TEP 196 should be taken concurrently with a field experience course (TEP 171 or 181).

- c. TEP 126 (Social Organization of Education) or Sociology 150L (The Politics of Language and Ethnicity)
- d. One of the following courses: TEP 117/Sociology 117 (Language, Culture, and Education), Anthropology 143 (Education and Culture), Com/Hipp 122A or B (Communication and the Community).

2. Minor in the Cultural Context of Teaching and Learning

The cultural context of education minor program provides the student with exposure to the politics of difference and discrimination, as they create the context for education in our society. Courses are focused on two areas, the first centered around issues of difference and equity in society, and the second focused on education.

a. Cultural Context Component (three courses)

Under the first section can be included any courses in ethnic studies, women's studies, as well as anthropology, sociology, philosophy, etc., which focus on issues of difference, discrimination, and/or equity along lines of gender, ethnicity, physical attributes, sexual orientation, etc. **Three** courses are required from this section, and are subject to approval by TEP (contact your college advising office for appropriate Minor Petition forms).

b. Teaching and Learning Component (three courses)

Three courses from the following: TEP 117 (Language, Culture and Education), TEP 126 (Social Organization of Education), Anthropology 143 (Education and Culture), TEP 162 (Computer Applications in Teaching and Learning), 171A-B or 181A-B-C (Practicum in Learning), TEP 121 (Public Service: Practicum in Learning), P.E. 133 (Fitness for Future Teachers), or TEP 172 (Child Development and Education). [**One** of the following courses may be substituted for TEP 172: Cognitive Science 113/Psychology 136 (Cognitive Development), Psychology 101 (Introduction to Developmental Psychology), or TEP 196 (The Psychology of Teaching and Structure of Information for Human Learning).] Other TEP courses may be approved by the TEP office.

requisite and credential programs outlined above in their entirety. This will lead to the award of the Professional Clear Credential from the state of California.

THE MASTER OF ARTS IN TEACHING AND LEARNING

The Teaching and Learning Course Group offers a master of arts degree, designed to assist professional educators in elementary and secondary schools make instructional decisions based on valid educational information. Participants are offered an extensive overview of principles of educational research which they use to design, implement, and evaluate a curriculum project in their own classrooms.

ADMISSIONS TO THE M.A. PROGRAM

Admission to the M.A. program is based upon the applicant's undergraduate record, postbaccalaureate work, any previous graduate work, and three letters of recommendation. In addition, the Teacher Education Program requires scores from the Graduate Record Examination, possession of a current California teaching credential, and a minimum of one year of successful teaching experience.

Applicants must make the following submissions no later than **March 1**:

1. Submit to the Office of Graduate Admissions, University of California, San Diego, La Jolla, California 92093-0086

a. Official application for admission and awards

b. Nonrefundable application fee (amount specified in application).

2. Submit to the Teacher Education Program, University of California, San Diego, La Jolla, California 92093-0070:

a. Two official transcripts from each college or university attended, including award of a bachelor's or higher degree with a minimum 3.0 cumulative GPA from the institution granting the degree.

b. At least three letters of recommendation.

c. Official scores on the Graduate Record Examination (GRE) for the verbal and quantitative aptitude. Applications may be obtained from the Educational Testing Service, Box 955, Princeton, NJ 08540. **In order to have scores sent to the Teacher Education Program, UCSD, follow instructions for reporting scores to unlisted institutions, by entering TEP's address on the "Additional Score Report Form" in the**

GRE Bulletin. There is no additional charge for use of this form.

d. Evidence of teaching or educational assignment for the duration of the graduate program. If you do not currently have a teaching contract for 1992-93, any admission decision will be provisional upon your receiving such a position.

e. Verification of a current California teaching credential or equivalent.

f. Verification of a minimum of one year full-time teaching experience.

RESIDENCE REQUIREMENT

Students must be enrolled for two full-time summer sessions during the course of study. Full-time study is six or more units during the summer.

PROGRAM OF STUDY

The M.A. in teaching and learning teaches professional educators to design curriculum based on sound educational research. The program requirements include forty units of course work and a master's thesis.

Graduates of the University of California credential programs may apply up to fourteen units of courses equivalent to TEP courses toward the M.A. requirements. Graduates of other credential programs may petition to transfer up to eight quarter-units of UCSD-equivalent postbaccalaureate course work toward the fourteen quarter-units of postbaccalaureate course work required by UCSD. No teaching methods courses are transferable, from any institution. See course listings at the end of this entry for information on TEP equivalent courses.

All students must complete an additional twenty-six units of graduate course work at UCSD. Students who are accepted into the graduate program begin full-time course work in the summer and attend part-time in fall, winter, and spring quarters and complete program course work with full-time study the following summer. The graduate courses are:

- TEP 230A, B, C: Research on Curriculum Design (4 units each)
- TEP 231: Advanced Instructional Practices (4 units)
- TEP 232: Advanced Topics in Education (4 units)
- TEP 290: Research Practicum (2 units)
- TEP 295: M.A. Thesis (4 units)
- and other courses as approved by the M.A. faculty adviser.

Table 3 shows a typical schedule for students in the teaching and learning M.A.



PROFESSIONAL CLEAR CREDENTIALS

The Teacher Education Program only admits individuals intending to complete both the pre-

TABLE 3

**M.A. in Teaching and Learning:
Typical Student's Schedule**

POST-BACC WORK	UC credential graduate with 14 transferable postbacc. units	Non-UC cred. graduate with 8 transferable postbacc. units	Graduate with no transferable postbacc. units
SUMMER 1992	TEP 231 TEP 290 (2)	TEP 231 TEP 290 (2) Elective (6-8)	TEP 231 TEP 290 (2) Elective (8)
FALL 1992	TEP 230A	TEP 230A	TEP 230A Elective (4)
WINTER 1993	TEP 230B	TEP 230B	TEP 230B Elective (2-4)
SPRING 1993	TEP 230C	TEP 230C	TEP 230C
SUMMER 1993	TEP 232 TEP 295	TEP 232 TEP 295	TEP 232 TEP 295

Courses

The following courses are offered by the TEP faculty. Students are advised to consult with a TEP adviser to determine which courses satisfy credential requirements. Undergraduate students may enroll in graduate seminars with the consent of instructor.

UPPER DIVISION

Anthropology 143. Education and Culture (4)

This course will provide an introduction to anthropological contributions to the understanding of education. We shall consider methodological and theoretical issues in the ethnography of schooling, social interaction in educational settings, language and education, ethnicity and education, psycho-cultural approaches to the study of learning and nonlearning, culture and achievement, culture and cognition, and cross-cultural research in education. *Prerequisite: Anthropology 22 or equivalent, or consent of instructor.*

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

Physical Education 133. Fitness for Future Teachers (4)

A lab/lecture course presenting resource ideas, in fitness, for future elementary teachers. Students in this course will learn the principles of fitness and how to apply these principles to develop activity programs for children and for themselves.

Sociology 150L. The Politics of Language and Ethnicity (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 117. Language, Culture, and Education (4)

The mutual influence of language, culture, and education will be explored; explanations of students' school success and fail-

ure that employ linguistic and cultural variables will be considered; bilingualism, cultural transmission through education. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (F,W,Su) Staff

TEP 121. 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. This course will satisfy the public service component of the new general-education requirement for Third College. (F,W,S) R. Hernandez, I. Villanueva.

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. *Prerequisite: upper-division standing or consent of instructor.* (Su) C. Diani

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. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (W,S,Su) Staff

TEP 160. 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. *Prerequisites: TEP 79 or TEP 80: major.* (F,W) W. Cooper, I. Villanueva

TEP 162. Computer Applications in Teaching and Learning (4)

This course introduces students to microcomputers viewed as a component of interactive communication media. Students will acquire application skills and hands-on experience with microcomputers and computer networks, examining the possible impact of these new media on the teaching/learning process. 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.* (Su,F,S) D. Stermon

TEP 170A-B-C. Internship Field Experience (8-8-8)

Each credential candidate works as a paid intern for a period of one year under the guidance of an on-site teacher and university supervisor. The internship (or optional full-time unpaid student teaching assignment) gives the prospective teacher extensive experience organizing and implementing lessons under actual classroom conditions. *Prerequisite: affirmed credential candidate or consent of instructor. Department stamp required.* (F,W,S) W. Cooper, J. Smith and D. Stermon

TEP 171A-B-C. Pre-Internship Practicum in Learning (4-4-4)

This course series focuses on the teaching/learning process in secondary schools. 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 forty 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 171A-B-C. Must have successfully completed 171A for 171B, and 171A-B for 171C. TEP 171C enrollment limited to students concurrently applying to the TEP Internship Program.* (F,W,S) W. Cooper, J. Smith and D. Stermon

rently applying to the TEP Internship Program. (F,W,S) W. Cooper, J. Smith and D. Stermon

TEP 172. Child Development and Education (4)

This course introduces prospective teachers to the cognitive, social, and emotional development of children. Topics include developmental learning theory, the teaching/learning process, maturation, and cross-cultural variation in development. Implications for classroom practice will be drawn. *Prerequisite: affirmed credential candidate or consent of instructor.* (S) Staff

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. *Prerequisites: TEP 80, major, or consent of instructor.* (Summer) W. Cooper

TEP 174. Secondary Mathematics Teaching Practices (4)

This course introduces prospective secondary teachers to mathematics teaching techniques. Topics include: mathematics curriculum design, California Model Curriculum Standards, instructional methods, computer applications, selection and use of textbooks, student assessment, lesson planning, and classroom organization. Professional matters such as involvement in curriculum planning, professional organizations, use of paraprofessionals, professional ethics, education law, and parent involvement are also addressed. *Prerequisite: confirmed Secondary Internship Credential candidate or consent of instructor.* (Summer) D. Stermon

TEP 175. Secondary Science Teaching Practices (4)

This course introduces prospective secondary teachers to science teaching techniques. Topics include: 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 such as involvement in curriculum planning, professional organizations, use of paraprofessionals, professional ethics, education law, and parent involvement are also addressed. *Prerequisite: confirmed Secondary Internship Credential candidate or consent of instructor.* (Summer) J. Smith

TEP 176. Writing, Reading, and Language Instruction (4)

This course satisfies the California Commission on Teacher Credentialing requirement for preparation in reading theory and methods for all credential candidates. Topics include: theories of reading development, integration of the language arts, reading and writing in the content areas, teaching methods and applications of literature. *Prerequisite: affirmed credential candidate or consent of instructor. Department stamp required.* (W) K. Cooley

TEP 177. 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: affirmed credential candidate or consent of instructor. Department stamp required.* (W,Summer) J. Smith

TEP 178. Mainstreaming Special-Needs Students (4)

This course satisfies the Commission on Teacher Credentialing requirement for Special Education. Topics include: preparation in appropriate 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: affirmed credential candidate or approval of instructor.* (S) C. Lawrence-Wallace

TEACHER EDUCATION PROGRAM

TEP 180A. Practicum in Student Teaching (9)

The teacher candidate will be assigned to a classroom in one of the participating schools under the supervision of a participating master teacher. The candidate will begin teaching in the first week of spring quarter and will spend at least six hours a day, five days a week for eight weeks in the classroom. The experience is designed to give the candidate thorough practical classroom experience and diversified responsibilities. *Prerequisites: confirmed TEP candidacy and department stamp required.* (W) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

TEP 180B. Practicum in Student Teaching Internship (9)

The teacher candidate will be assigned to a classroom in one of the participating schools under the supervision of a participating master teacher. The candidate will begin teaching in the first week of spring quarter and will spend at least six hours a day, five days a week for eight weeks in the classroom. The experience is designed to give the candidate thorough practical classroom experience and diversified responsibilities. *Prerequisites: TEP 180A and department stamp required.* (S) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

TEP 181A-B-C. Practicum in Learning (4-4-4)

Students are assigned as classroom teaching assistants in San Diego public schools. Concurrent course work concerns theories of teaching and learning, multicultural education, and the community context of learning. TEP 181A emphasizes the community context, TEP 181B emphasizes the social organization of schools, and TEP 181C emphasizes the teaching-learning process. *Prerequisite: department stamp and instructor's signature for TEP 181A-B-C. Must have successfully completed 181A for 181B, and 181A-B for 181C.* (F,W,S) P. Levin, J. Janis

TEP 182A-B-C. Practicum in Interactive Computing (4-4-4)

The course focuses on interactional computing in teaching-learning and communicative situations. 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. *Prerequisite: TEP 162 or consent of instructor.* (F,W,S) Staff

TEP 189. Curriculum Design for Bilingual Instruction (4)

Topics addressed in this course include: advanced methods of instruction for bilingual classrooms; teaching in content areas; curriculum developmental in language arts and other subjects; technical teaching vocabulary; integrating bilingual and multicultural educational approaches. *Prerequisite: affirmed TEP candidate or consent of instructor. Department stamp required.* (F) I. Villanueva

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: affirmed teacher candidacy.* (F,W,S) Staff

TEP 191A. Innovative Instructional Practices (6)

This is one of a three-course sequence providing pedagogical methods for teaching. Diverse subject areas are integrated into a single intercurricular course of study by emphasizing activity/inquiry techniques of instruction. *Prerequisite: affirmed TEP candidate.* (F) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

TEP 191B. Innovative Instructional Practices (6)

This is one of a three-course sequence providing a theoretical and practical grounding in various pedagogical techniques for teaching. Students pursuing the bilingual emphasis are provided instruction in bilingual teaching techniques within the framework of the course. *Prerequisite: TEP 191A or consent of*

instructor. (W) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

TEP 191C. Innovative Instructional Practices (2)

This is one of a three-course sequence providing pedagogical techniques for teaching. This course is held concurrently with student teaching. *Prerequisite: TEP 191A-B or consent of instructor.* (S) C. Lawrence-Wallace, I. Villanueva, J. Janis, and K. Cooley

TEP 192AB. Bilingual Instructional Practices (4)

History and models of bilingual education; sociocultural issues associated with second language instruction, legal requirements for public school bilingual program, native language, and ESL teaching methods. *Prerequisite: affirmed TEP candidate.* I. Villanueva, J. Smith

TEP 193. 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. (F) C. Lawrence-Wallace, H. Mehan

TEP 195. Apprentice Teaching (4)

Advanced TEP students are prepared in effective methods of supervising the preparation of UCSD students serving as para-professionals 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. *Prerequisite: consent of instructor.* Staff

TEP 196. The Psychology of Teaching and Structure of Information for Human Learning (0 or 4)

College students tutoring college students. Curriculum: basic applied learning principles, specifying objectives, planning and designing instruction, testing, evaluation, interpersonal communication skills, study skills. Objectives will be assessed by project completion and practicum feedback. This course is not creditable toward professional preparation requirements for the multiple option credential. *Prerequisite: consent of instructor.* (F,W,S) V. Cifarelli

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.* Staff

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.* Staff

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.* C. Cooper

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 con-

tribute to a theoretical understanding of the writing process. B. Tomlinson

Psychology 211. Piagetian Theory (3)

Seminar on selected topics in Piaget's theory of cognitive development. *Prerequisite: consent of instructor.* J. Mandler

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. M. Cole

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. M. Cole

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. A. Cicourel

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. A. Cicourel

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. H. Mehan

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. H. Mehan

TEP 220. Research Design for Educational Inquiry (6)

An introduction to descriptive and inferential statistics research design techniques appropriate for research in educational settings, including interview, observation, audio visual and testing which lead to inferences about teacher-student interaction, classroom organization, curriculum design, and the relationship of the classroom to the school, the community, and society. Experience with computer supported statistics packages is included as part of the course requirements. *Prerequisite: M.A. candidate or consent of instructor.* (F) H. Mehan and R. Souviney

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. (Su,F,W,S) P. Levin

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) Staff

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) Staff

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.) P. Levin

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.* Staff

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.* Staff

THEATRE

OFFICE: 2550 Galbraith Hall, Revelle College

Professors

Andrei Belgrader, M.F.A.
Eric Christmas, *Emeritus*
Frantisek Deak, Ph.D., *Chair*
Deborah Dryden, M.F.A.
Floyd Gaffney, Ph.D.
Jorge Huerta, Ph.D.
Walton Jones, M.F.A.
Adele Shank, M.A.
Theodore Shank, Ph.D.
Arthur Wagner, Ph.D., *Emeritus*

Associate Professors

Andrei Both, M.F.A.
James Carmody, Ph.D.
Mary Corrigan, M.A.
Luther James
Chris Parry
Jonathan Saville, Ph.D.
James Winker, M.F.A.

Lecturers with Security of Employment

Steven Adler, M.F.A.
Margaret C. Marshall, M.F.A.
Patricia A. Rincon, M.F.A.

Assistant Professors

Tony Curiel, M.A.
Allan Havis, M.F.A.
Kent Kirkpatrick, M.F.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.

Adjunct Faculty

John Arnone, B.A.
Des McAnuff
Marianne McDonald, Ph.D.

THE UNDERGRADUATE PROGRAM

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, Third, and Fifth College'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

- 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.
- 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.
- Each of the area threshold classes:
Performance Area—
a) THAC 1 (Introduction to Acting)
or
b) Any *one* of THDA 1AB (Ballet I) or THDA 2AB (Modern Dance I) or THDA 3AB (Jazz Dance I)
Note: A and B equals a completed course
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

- Any four, 4-unit upper-division courses in history and theory (THHS)
- 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).
- Any four, 4-unit upper-division 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 elective.

Upper-Division Requirements

4. Any three upper-division 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 de-

partment produces a faculty-directed undergraduate production on the mainstage. The cast, designers, and crew are undergraduates.

Cabaret

Almost every weekend, graduate and undergraduate students 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 four core courses: three 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. All students must maintain continuous participation in studio classes throughout enrollment in the minor. 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 I) 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.

Dance minors will be required to take movement courses every 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 Course—Four Units Total
 THAC I Introduction to Acting
 or
 THDE 1 Introduction to Design

Upper-Division Requirements:

Three Courses—Twelve Units Total
 THDR 141 Principles of Choreography
 THDR 142 Choreography and Performance
 One of THHS 151 or 152 or 153

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 10A, B, or C 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	12
Total Movement Units	12
(may be upper- or lower-division units)	

Total Units for Dance Minor Students 28

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, Mc-

Caleb & 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 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 train-

ing 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. *No prerequisite.*

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 12. Movement for the Actor (4)

Course emphasizes movement to illuminate character and explore the freedom of mind and body working together. Course includes games, exercises, and energy principles

from aikido, tai chi, Laban, Alexander, and yoga to expand the actor's range of characterization through movement. 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.

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.

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 121. Ensemble (4)

A faculty-directed workshop-style performance of a play or original script from the contemporary theatre (usually American) that explores issues of contemporary life. Emphasis will be on how theatre can reflect personal experience on using the theatrical process as a means of thinking about our behavior and our values, and on theatre as an opportunity to play imaginatively as adults. Topics may include: TV drama, ten-minute plays, environmental theatre or serial dramas. Consent of instructor required.

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/AC 125. Acting Lab (4)

Participation in a project directed by student directors under faculty supervision. Audition may be required. A total of four units may count toward major requirements. *Prerequisite: THAC 1.*

■ **TH/DA DANCE**

TH/DA 1A-B. 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: THDA 1A is prerequisite for THDA 1B.*

TH/DA 2A-B. 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: THDA 2A prerequisite for THDA 2B.*

TH/DA 3A-B. 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: THDA 3A prerequisite for THDA 3B.*

TH/DA 10A. Musical Theatre Dance A (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.

TH/DA 10B. Musical Theatre Dance B (2)

A continuation of the exploration of the historical development of musical theatre character dance forms covering the 1930s through the 1960s. Emphasizes composition and movement techniques of this rich period of pioneers and

stylists. Choreography for film will be introduced. *Prerequisite: THDA 10A.*

TH/DA 10C. Musical Theatre Dance C (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: THDA 10B.*

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 10A.*

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 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 1B 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 principles and elements of modern dance and their relationship to other art forms. Discussion of modern dance pioneers. *Prerequisites: THDA 2B 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 principles 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. Contempo-

rary 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 3B 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 study 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 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.

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.

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. *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.

**TH/DE 122. Lighting Design/Craft and Mechanics—
Advanced (4)**

This course covers lighting design theory, craft, and organizational techniques. Student will learn drafting of light plots, types and calculation of lighting for different spaces and production styles, methods for recording the design, craft skills and techniques of an assistant lighting designer. Field trip. (Part one of a two-part sequence. See THDE 123.) *Prerequisites:* THDE 1 and THDE 121.

**TH/DE 123. Lighting Design/Composition and Ideas—
Advanced (4)**

This course aims to develop the student designer's visual imagination in the context of lighting design and composition through a series of studio/lab practical projects. These emphasize research, conceptualization, visual expression, and collaboration. Studio work involves manipulating light and color and drafting a light plot. (Part two of a two-part sequence. See THDE 122). *Prerequisites:* THDE 1 and THDE 121.

TH/DE 131. Special Topics in Theatre Design (4)

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, rendering, drawing. Topics will vary from quarter to quarter. *Prerequisite:* THDE 101 or 111 or 121.

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.

TH/DE 133. Visual Ideas (4)

This course is an exploration of fundamental ideas (ways of seeing, thinking, expression, style, etc.) throughout the history of visual arts, from the Renaissance to the present. Special emphasis on theatrical space and design, as they reflect significant artistic movements. An integrated study through reading, research, projects, and lecture. THHS 105 or 106 or 107 recommended. *Prerequisite:* THDE 1 and upper-division standing.

**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. *Prerequisites:* 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 110. History and Art of Directing (4)

An examination of the director's artistic and interpretive responsibilities. Emphasis on the historical evolution of the director as central artist in the theatre. Concentration on the research, analysis, and textual preparation for directing.

TH/DR 111. Directing Process (4)

An introductory course in directing practice using information-getting exercises, improv, text analysis. Culminates in the guided rehearsal process of a scene or scenes from a play chosen by the instructor. *Prerequisite:* THDR 110.

TH/DR 112. Advanced Directing (4)

A studio course focusing on the creation (with actors) of a physical realization of text. Course uses selected scenes as model studies in which problems of composition, development of action, interaction of characters, motivational movement and fusion of text and action are explored. Interview required. *Prerequisites:* THDR 110 and 111 and consent of instructor.

TH/DR 140. Art and Theory of Movement (4)

Participants will learn movement theories, increasing aesthetic awareness. Improvisation techniques will evaluate kinesthetic awareness. Students will create movement studies utilizing creative expression and movement communication.

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 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 110, 111, 112, 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 1. Introduction to the Theatre (4)**

An introduction to fundamental concepts in drama and performance. Students will attend performances and learn about how the theatre functions as an art and as an industry in today's world.

TH/GE 2. From Text to Performance (4)

Examination of representative dramatic literature from the text through rehearsal, to the culminating performance. Lectures on the play and its background, the work of the actor, director, and designers. Attendance at rehearsals and a performance of the play.

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.

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.

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.

TH/GE 14. Rock Performance (4)

An examination of the American and European rock performances as a theatrical activity by developing a knowledge of the theatrical components of performance and analysis of text.

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.

TH/GE 20. Introduction to Performance (4)

An introduction to the act of performing. Using exercises designed to free the imagination, the student actor is guided through his or her first performance experience using dramatic text. The student will also be exposed to basic skills and principles necessary to the dramatic experience. Students are required to attend all Department of Theatre productions in the quarter they are enrolled in this course. *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, 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 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, man as a dreamer, man as a self-destroyer, and man as both victim and victor in the conflict with his cosmos.

TH/HS 2. Drama Survey: Comedy (4)

Study of comic tradition from Aristophanes to the end of the nineteenth century.

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 expressionism to the epic theatre.

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 films, 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 106. Romantic Theatre (4)

Examines the influence of the nineteenth century Romanticism on contemporary theatre and Romanticism as a fundamental attitude toward art and life present throughout history. Emphasis on how the Romantic premises and attitudes found their expression in elements of theatrical structure. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 107. Realistic Theatre (4)

Examines the influence of nineteenth-century realism on contemporary theatre and realism as one of the fundamental attitudes toward art and life present throughout history. Emphasis on how the realistic premises and attitudes found their expression in elements of theatrical structure. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 108. Topics in the History of Avant-Garde Theatre (4)

The course will cover the tradition of the avant-garde theatre performances from the end of the nineteenth century to the Second World War. It will deal with the individual artists as well as movements that were the most representative and influential on the culture of the twentieth century. *Prerequisite: THHS 1 or 2 or 3 or consent of instructor.*

TH/HS 109. Modern Black Drama (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. Course examines plays, playwrights, and participants in contemporary black theatre. (Cross-listed with Ethnic Studies 177.) *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—playwrights, 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/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.

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.

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.

TH/PR 4. 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.

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 103, 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.

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-scène*. *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.

206. Concepts in Stage Movement (3)

The discussion and analysis of choreographic movement and patterns and the interrelationship of objects in

space. Includes practical work. *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. *Prerequisite: Theatre 42, 43, 44, and consent of instructor.*

227. Hispanic-American Dialects (4)

Intensive work on the major Hispanic-American dialects, focusing on Chicano, Nuyorican, and Cuban American distinctions in English. Particular dialects will be based on the needs of the growing canon of Hispanic-American plays.

228. Popular Entertainment Techniques (4)

Popular Entertainment Techniques will focus on a variety of styles employed in popular theatre throughout the world. Course work will include movements such as the *Teatro Campesino*. The theatre of Augusto Boal and Enrique Bonaventura will be explored with guest instructors and resident professionals.

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.

236. Actor's Recital (1-3)

A course designed to allow for the careful and thorough selection, rehearsal, and performance of an actor's recital, composed of material ranging from the classical to the contemporary theatre, and determined by the particular artistic interests and capabilities of the performer.

237. Teatro Seminar (2)

An ongoing seminar devoted to playwrights, theatre companies, and other individuals involved in Hispanic American theatre. Topics will vary each quarter and will address issues important to the development of Hispanic theatre.

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.

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.

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.*

244. Dramatic Structure (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.

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 inception 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 (4)

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.

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.*

254. Topics in Dramaturgy (4)

Lecture/discussion course focusing on dramaturgical process and method in world theatre. Emphasis will be placed on developing an understanding of the dramaturg's function with regard to interpreting classic works of dramatic literature and to developing new plays for the contemporary theatre.

255. Restaging the Classics (1-4)

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.*

259. Critical Writing (4)

An examination and analysis of published articles in the field of contemporary American theatre and the writing of an article for potential publication which documents and analyzes a theatre piece. *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 post-modernism. *Prerequisite: graduate standing.*

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.*

270A-B-C. Design Studio I: _____ (1-6)

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; 270B: Costume Design; 270C: Lighting Design. *Prerequisite: graduate standing.*

271A. Master Class in Design I (1-6)

Design studio class involving all first-year graduate designers. Project in scenery, costumes, lighting as per specialization of designer. Group critiques of individual projects and production designs-in-progress. (Every spring

quarter.) *Prerequisite: Must be a first-year graduate student or by special arrangement.*

271B. Master Class in Design II (1-6)

A studio class involving all second- and third-year graduate designers and directors. Class emphasizes collaboration between designers and directors in developing individual projects and the production designs-in-progress in scenic, costume, and lighting, in conjunction with ongoing group critiques. Projects addressed may be theoretical or production in the departmental calendar. *Prerequisite: second- and third-year graduate standing.*

274. Advanced Scenic Design (1-4)

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 (1-4)

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.

276. Advanced Costume Design (1-4)

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays.

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, silk-screen, 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.*

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 (1-6)

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.

297. Thesis Research (2-12)

Thesis research for M.F.A. degree. (S/U grades only.)

THIRD WORLD STUDIES

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.*

classes in science and mathematics, and University Honors at graduation all add to the challenge of honors education at Third College and UCSD.

Courses

10. Third 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.)*

20. Third College Freshman Honors Seminar (0)

Weekly one-hour seminars conducted by distinguished UCSD faculty in a wide variety of disciplines. Students will gain insight into pioneering research and contemporary developments in the sciences, social sciences, humanities, and fine arts at UCSD. *Prerequisite: by invitation only. Pass/Not Pass grades only. (F)*

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.)*

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 relationship between Third World groups within the United States (Asian-American, Afro-American, Chicano, and Native American) and Third World societies (African, Asian, and Latin American) through a comparative approach. Third World societies are compared as they existed before contact with the West, in the various colonial relationships with the West, and in their evolution after independence.

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 one of the Third World studies sequences (TWS 21, 22, 23; TWS 24, 25, 26; HILD 1A-B-C; or HILD 10-11-12). Selection of a specific concentration, discipline, or department should be determined in consultation with a Third World studies faculty member or program adviser.

DOUBLE MAJOR

Students interested in Third World studies as a double major must have *eight* upper-division courses beyond their departmental major requirements. These eight may cover one or more disciplines. Courses may focus on a theme or prob-

450



THIRD COLLEGE

HONORS PROGRAM

OFFICE: Provost, Third College, Administration Building

The Third College Honors Program provides exceptional students at Third College the organization and environment within which to pursue individual excellence. Participation in the Third College Honors Program entitles high-achieving students to enroll in the Freshman Honors Seminar upon entry in fall quarter. The seminar provides a forum to introduce our best students to the excitement of pioneering research and innovative scholarship in all disciplines at UCSD.

Other highlights of the general honors program include a quarterly Speakers' Forum, which brings together faculty and honors students for informal presentations on recent research or current events in all fields facilitated by faculty and other prominent persons. The quarterly Provost's Chat provides a relaxed and friendly atmosphere to directly discuss items of interest to honors students with the provost of the college. Third College recognizes superior achievement each year with an Honors Recognition Celebration for outstanding scholastic performance and with the Provost Award at graduation for outstanding academic achievement and breadth of scholarship. The potential for Phi Beta Kappa membership, departmental honors programs, small honors

THIRD WORLD STUDIES

OFFICE: Literature Building, Rm. 3410, Warren College

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*

Assistant Professor

Suzanne Brenner, Ph.D., *Anthropology*

Adjunct Professor

Leften S. Stavrianos, Ph.D., *History*



lem 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 a lower-division Third World studies sequence (TWS 21, 22, 23 or TWS 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

14. Politics and the Third World Poor (4)

(Same as Political Science 14.) This course explores the context, structure, purpose, and fate of collective political action by the urban and rural poor in Latin America, Asia, and Africa. It examines local as well as national political organizations and their economic, social, and cultural foundations.

21-22-23. Third World Literatures (4-4-4)

An introduction to the cultures of various Third World countries through close reading of selected literary texts. TWS 21 focuses on African literature. TWS 22 deals with Latin American literature and TWS 23 examines Chinese literature. Topics will vary each quarter. (F,W,S)

24. Origins and Consequences of Underdevelopment (4)

(Same as HILD 4A.) The history of the Third World peoples of Asia, Africa, and Latin America is surveyed from the fifteenth century to 1900. It traces the origins of European empires, the interrelationships between these empires and the process of underdevelopment, the meaning of imperialism as an experience shared by Third World peoples, and the beginning of indigenous resistance to imperialism.

25. China and the West in Modern Times (4)

(Same as HILD 4B.) This course surveys the eighteenth-, nineteenth-, and early twentieth-century history of China. Special emphasis is placed on the nature of the various Chinese responses to the political, economic, and cultural impact of the West on traditional Chinese society. (W)

26. Third World: Nationalist Rebellions and Economic Development (4)

(Same as HILD 4C.) The course surveys the attempts of nationalist movements to seize power in Africa, Asia and Latin Amer-

ica, and to then design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. The means by which such movements take power will take up the first part of the course; the second part is devoted to their economic problems. The revolutions in China, Cuba, Vietnam, Kenya, and Chile are among the cases that will be examined in detail. (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

URBAN STUDIES AND PLANNING

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- 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.

URBAN STUDIES AND PLANNING

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226 Cognitive Science Building

Professors

- Robert F. Engle, Ph.D., *Economics*
- Ramon A. Gutierrez, Ph.D., *Ethnic Studies/History*
- Robert M. Kaplan, Ph.D., *Community and Family Medicine*
- George Lipsitz, Ph.D., *Ethnic Studies*
- Hugh G. Mehan, Ph.D., *Sociology/Teacher Education Program*
- Michael E. Parrish, Ph.D., *History*

Associate Professors

- Rae L. Blumberg, Ph.D., *Sociology*
- Amy Bridges, Ph.D., *Political Science, Coordinator of Urban Studies and Planning*
- Steven P. Erie, Ph.D., *Political Science*
- Ivan T. Evans, Ph.D., *Sociology*
- Marcelo Suarez-Orozco, Ph.D., *Anthropology*

Assistant Professors

- Lisa M. Catanzarite, Ph.D., *Sociology*
- William F. Deverell, Ph.D., *History*
- Richard G. Kronick, Ph.D., *Community and Family Medicine*
- Leland T. Saito, Ph.D., *Ethnic Studies*

Director of Field Studies

- Keith Pezzoli, Ph.D.

Lecturer

- Barbara L. Brody, M.P.H., *Community and Family 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 social science 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 inter-

ested 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, Third, Warren, or Fifth 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; two courses in lower-division economics; Social Science 60; and twelve courses in upper-division urban studies and planning. *Students are encouraged to complete the lower-division prerequisites before they enroll in the upper-division courses.*

In accordance with campus academic regulations, courses used to satisfy the major cannot be applied toward a minor, although some overlap is allowed for double majors. Students may elect to take the lower-division economics prerequisites on a Pass/No Pass basis. All other lower-division and upper-division requirements must be taken for a letter grade. A 2.0 grade-point average is required for all courses in the major. Transfer students should see an 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, and 3. In addition, they must complete either Economics 1A-B or Economics 2A-B, and Social Science 60.

UPPER-DIVISION REQUIREMENTS

The upper-division requirements in urban studies and planning are:

1. three foundation courses
2. three social science courses
3. three policy and planning courses
4. senior sequence of field work and internship
5. Either an honors thesis (USP 190) *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 130. Ethnography of San Diego (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 are required to take six units of urban fieldwork seminar (USP 186) and six units of internships (USP 187) under the direction of the field studies instructor.

N.B.: Because USP 187 is an internship, no other internship or field placement (e.g., TEP 181) 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 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 118. Poverty in Urban America
- USP 132. Race and Ethnic Relations in Urban America
- USP 133. Social Inequality and Public Policy
- USP 150. Black Ghetto
- USP 151. Special Topics in the History of Los Angeles
- USP 159. Modern and Postmodern Urbanism
- USP 160. Western Environmental History
- Anthropology 116. Urban Anthropology
- Economics 116. Economic Development
- Economics 130. Public Policy
- Economics 134. Regional Economics
- 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 121. Contemporary Asian-American History
- Ethnic Studies 151. Ethnic Politics in America
- Ethnic Studies 182. Segregation, Freedom Movements, and the Crisis of the Twentieth Century
- Ethnic Studies 190. Research Methods: Studying Racial and Ethnic Communities
- History 114. California History
- History (HILA) 115. Latin American City, a History
- History (HIUS) 140. Economic History of the United States
- Political Science 100G. American Politics and Public Policy
- Political Science 100H. Race and Ethnicity in American Politics
- Political Science 102J. Advanced Topics in City Politics
- Political Science 103A. California Government and Politics
- Political Science 106A. Politics and Bureaucracy
- Political Science 138. Political Economy of Urbanization
- Political Science 160AA. Introduction to Policy Analysis
- Political Science 160AB. Introduction to Policy Analysis
- Psychology 104. Introduction to Social Psychology
- Sociology A/100. Classical Sociological Theory
- Sociology C/121. Economy and Society
- Sociology C/122. Sociology of Organization
- Sociology C/123. Sociology of Work
- Sociology C/124. Occupations and Professions
- Sociology C/136B. Sociology of Mental Illness: In Contemporary Society
- Sociology C/140. Sociology of Law
- Sociology C/141. Crime and Society
- Sociology C/144. Forms of Social Control
- Sociology C/148. Political Sociology
- Sociology C/148E. Ethnicity and Politics
- Sociology C/148I. Collective Identity and Group Formation
- Sociology C/149. Theory of Social Problems
- Sociology C/150. Equality and Inequality
- Sociology D/151. Comparative Race and Ethnic Relations

- Sociology C/159. Special Topics in the Sociology of Organizations and Institutions
 Sociology D/179. Social Change
 Sociology C/180. Social Movements and Social Protest

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. Border Planning
 USP 106. Valencia Park Elementary
 USP 123. Housing Policy
 USP 124. Land Use Planning
 USP 125. Topics in Urban Planning
 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 173. History of Urban Planning and Design
 USP 174A. Introduction of Urban Design
 USP 174B. Practice in Urban Design
 USP 175. Environmental Problems
 USP 177. Design and Public Policy
 USP 179. The Form of Design: Images, Creation, and Practice
 USP 180. Culture and the Meaning of Design
 Anthropology 143. Education and Culture
 Economics 131. Economics of the Environment
 Economics 138. Economics of Health
 Philosophy 122. Bio-Medical Ethics
 Philosophy 127. Professional Ethics
 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
 Sociology B/137. Alcohol and Society
 Visual Arts 108. Art in Public Places

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.

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. (F)
- 1W. Comparative Urbanization—Writing Practicum (6)**
 A writing-intensive version of USP 10 that teaches writing and analytic skills in conjunction with the study of historical and comparative survey of cities throughout the world.
- 2. Urban World System (4)**
 Examines the contemporary division of labor among cities. Students in the course will study interdependence in the world system, Third World industrialization, the place of U.S. cities in the global economic order, and the post-industrial transformation of U.S. cities. Course readings will trace the effects of the creation of a world system on social groups, classes, and individuals.
- 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 Econ. 135.) Urban economic problems and public policies to deal with them. *Prerequisite: One introductory micro- and one introductory macro-economics course.*
- 103. U.S. 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.
- 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 (water, air pollution, sewage management), city planning issues (transportation, land use, housing, industrial development), twin cities, San Diego, and Tijuana. *Prerequisite: none. (USP 10, 11, or 12 recommended.)*
- 106. Valencia Park Elementary (4)**
 Urban studies and planning has a continuing relationship with Valencia Park Elementary School. Students from urban studies and planning tutor students at Valencia Park. Readings assigned in education and child development. *Prerequisite: upper-division standing.*
- 107. Urban Politics (4)**
 (Same as Poli. Sci. 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: Political Science 10 or consent of instructor.*
- 118. Poverty in Urban America (4)**
 A lecture-discussion course investigating the primary causes of poverty in urban America, the social, psychological, and political consequences for society, and the attempts, both public and private, to alleviate poverty during the past half century. *Prerequisite: none.*
- 123. Housing Policy (4)**
 (Same as Econ. 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.*
- 125. Topics in Urban Planning (4)**
 Seminar on selected topics in urban planning, such as downtown redevelopment, transportation policy or planning in Third World countries. Topics to be covered will be announced at the beginning of the quarter. *Prerequisite: upper-division standing or consent of instructor.*
- 130. Ethnography of San Diego (4)**
 This course examines social, political, and economic issues in ethnic communities. These issues are explored through ethnographic field work which attempts to construct a description of activities and events, and their meaning, from the point of view of the community residents. *Prerequisite: upper-division standing or consent of instructor.*
- 132. Race and Ethnic Relations in Urban America (4)**
 A historical/comparative examination of the causes and consequences of minority/majority group conflicts and inequality in contemporary American society. *Prerequisite: upper-division standing or consent of instructor.*
- 133. Social Inequality and Public Policy (4)**
 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.*
- 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. (F)*
- 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. (W)*
- 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. *Prerequisites: upper-division standing, consent of instructor.* (S)

147. Case Studies in Health Care Programs/Poor and Underserved Populations (4)

The purpose of this course is to identify the special health needs of low income and underserved populations and to review their status of care, factors influencing the incidence of disease and health problems, and political and legislative measures related to access and the provision of care. Selected current programs and policies that address the health care needs of selected underserved populations such as working poor, inner city populations, recent immigrants, and persons with severe disabling mental illnesses will be studied. Offered in alternate years. *Prerequisite: consent of instructor.* (S)

150. The Black Ghetto (4)

Examination of the black ghetto from about 1880 to the present. Trends in migration, the patterns of economic and social adjustment, shifts in ideology and protest, and the demand for community control are themes. *Prerequisite: consent of instructor. See department.*

151. Special Topics in the History of Los Angeles (4)

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.

159. Modern and Postmodern Urbanism (4)

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, multi-cultural citizenship, social and spatial polarization, interactive architecture, "third-worldization." *Prerequisite: upper-division standing.*

160. Western Environmental History (4)

American settlers' interaction with the western environment. Focus on the distinction between objective environmental science and the subjective views of settlers and historians.

170. Planning Theory and Practice (4)

Major intellectual traditions of planning thought and practice. Historical and comparative analysis of urban planning in relation to social change. Mainstream and grassroots approaches. Impact of urban social movements in the First and Third World. *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.*

174A. Introduction to Urban Design (4)

In a structured exercise, students learn how to view San Diego as an urban designer/urban planner. Current planning projects, special geographical features, and other forces at work shaping San Diego's future design will be examined.

174B. Practice in Urban Design (4)

Focuses on the relationships among land programs, infrastructure, transportation issues, public open space, economic feasibility, social values, and aesthetics. Studio work addresses determining optimum building envelope relationships, site organization, ambiance, environmental chart, and user needs in selected urban areas.

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.

177. Urban Design as a Consequence Policy (4)

Examines some of the forces, such as transportation and environmental and housing policy, that generated the design of cities. How the city has evolved in the past, why it appears as it does today, and how it might change in the future. *Prerequisite: upper-division standing or consent of instructor.*

179. The Form of Design: Image, Creation, and Practice (4)

Our physical surroundings are shaped by design, from light-bulbs 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 and 187, 3.0 GPA in major, consent of instructor, and senior standing.*

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
Manny Farber, *Professor Emeritus*
Jean-Pierre Gorin, Licence de Philosophie
Helen Mayer Harrison, M.A.
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.
Patricia Patterson
Faith Ringgold, M.A.
Jerome Rothenberg, M.A.
Italo Scanga, M.A.
Jehanne Teilhet-Fisk, Ph.D.

Associate Professors

Steve Fagin, M.A.
Jack Greenstein, Ph.D.
Standish Lawder, Ph.D.
Fred Lonidier, M.F.A.
Babette Mangolte
Sheldon Nodelman, Ph.D.
Ernest Silva, M.F.A.
Phel Steinmetz

Assistant Professors

Geoffrey Batchen, Ph.D.
Sheldon Brown, M.F.A.
Susan Smith, Ph.D.
John Welchman, Ph.D.

Lecturer

Claudio Fenner-Lopez, M.A.

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 esthetic 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 esthetic 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 Fifth College, and undergraduate studio and computing courses are conducted nearby. 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, 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, and two sound-mixing studios.

The campus-wide Slide Library is located on the lower level of the Mandeville center with holdings in excess of 160,000 slides. The Mandeville Art Gallery displays a continually changing series of exhibitions, and the Mandeville Annex Gallery, located on the lower level, is directed by visual arts graduate and undergraduate students. A gallery and performance space, located in the new Visual Arts Facility, are directed by graduate students.

THE UNDERGRADUATE PROGRAM

COLLEGE REQUIREMENTS

The Department of Visual Arts teaches courses applicable toward the Muir and Warren general-education requirements, the Third humanities requirement, the Fifth 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.

RESIDENCY REQUIREMENTS

A minimum of 50 percent of the course work completed for the major must be taken as a registered student at UCSD.

Visual Arts 14, Nineteenth-and Twentieth-Century Art, and Visual Arts 111, Structure of Art, are required courses for transfer students.

NOTE: Rarely are transfer credits accepted toward fulfilling Group III requirements under the studio major.

MAJOR REQUIREMENTS

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

*Required for all studio majors.
**Required for all transfer majors.

Group II: Upper-Division Foundation Level

- 111 Structure of Art**

*Required for all studio majors.
**Required for all transfer majors.

Beginning Level

Four courses required (Note: Foundation level courses must be completed before taking 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 VA 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, Advanced Painting, or Life Drawing 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.

Program Requirements

Twenty courses in art history and criticism are required for the attainment of the bachelor of art degree in this program. Seven of these are lower-division courses and thirteen are upper-division courses, as explained below. Students who transfer to UCSD in their second or third year may petition to substitute courses taken at other colleges or universities for our lower-division requirements. However, they must show that the courses they have successfully completed are comparable to our own.

**FOUNDATION LEVEL—
Lower-Division**
(7 courses required)

- Western Art I: Prehistoric to Medieval (VA 11)
- Western Art II: Medieval to the Present (VA 12)
- Non-Western Art (VA 13)
- Nineteenth- and Twentieth-Century Art (VA 14)
- Introduction to Photography (VA 60)
- History of Film (VA 84)
- Introduction to Art Making (VA 1 or 2 or 3)

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:

- VA 111 Structure of Art
- VA 112 Art Historical Methods*

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

*Normally, VA 112 is taken during the third year after completing requirements listed under Group II-Distributional Requirement.

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 list.

All courses listed in Groups II and III, as well as courses in history and criticism of film, photography, and video:

- VA 150 History and Art of the Silent Cinema
- VA 151 History of Experimental Film
- VA 152 Film in Social Context
- VA 153 The Genre Series
- VA 154 Hard Look at the Movies
- VA 155 The Director Series
- VA 157 Video History and Criticism
- VA 158 Critical History of Twentieth-Century Photography

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 esthetic 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

*indicates seminar

VISUAL ARTS

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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

- VA 1,2, or 3 Introduction to Art Making
- VA 14 Nineteenth- and Twentieth-Century Art
- VA 84 History of Film

Group B

- VA 60 Introduction to Photography
- VA 70 Introduction to Media I (Technique/History)
- VA 71 Introduction to Media II (Theory)

All six courses listed under Groups A and B are required. Any and all courses except VA 70 and VA 71 can be taken simultaneously. VA 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

- VA 111 Structure of Art
- VA 174 Media Sketchbook

Both VA 111 and VA 174 are required and prerequisite to further study. Additionally, any three of the emphasis courses are required, but two of these must be completed before taking advanced courses. The department requires that students limit themselves to two production courses per quarter.

Film/Video Emphasis

- VA 172 Studio Video
- VA 176 Introduction to Filmmaking
- VA 177 Scripting and Editing Strategies

Photography Emphasis

- VA 164 Photographic Strategies
- VA 165 Camera Techniques

Group B—History, Criticism, and Theory

3 courses required

- VA 150 History and Art of the Silent Cinema
- VA 151 History of Experimental Film
- VA 152 Film in Social Context
- VA 153 The Genre Series
- VA 154 Hard Look at the Movies

- VA 155 The Director Series
- VA 157 Video History and Criticism
- VA 158 Critical History of Twentieth-Century Photography

NOTE: One course from VA 128A-E, Topics in Art History and Criticism, can be substituted for a Group B requirement.

VA 158 is required for all students with a photography emphasis.

ADVANCED LEVEL—Upper Division (6 courses required)

- VA 180 Documentary Media
- VA 183 Narrative Media

Both of the above are required. Additionally, four electives must be taken. VA 180 and VA 183 are repeatable for credit as electives, or choose four from the following list:

Electives

Both of the above advanced courses are required before VA 109 or 131 can be taken. The following two courses can be taken only with the approval of the instructor and are not required:

- VA 109 Advanced Projects in Media
- VA 131 Special Projects in Media

Film and Video Electives:

- VA 181 Sound and Lighting
- VA 182 Advanced Editing
- VA 186 Advanced Filmmaking Strategies
- VA 187 Animation
- VA 188 Optical Printing

Photography Electives:

- VA 166 Advanced Camera Techniques
- VA 168 Color Techniques

A total of twenty courses are required for the media major:

- 6 Foundation Level
- 8 Intermediate Level
- 6 Advanced Level

MASTER OF FINE ARTS PROGRAM

The program is designed to provide intensive professional training for the student who proposes to pursue a career within the field of art—including art making, criticism, 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 department seeks to provide an integrated and comprehensive introduction to the possibilities of contemporary art production, the intellectual structures which underlie them, and the "world view" which they entail. All art-making activities are considered serious intellectual endeavors, and all students in the program find themselves confronted by the need to develop their intellectual and critical abilities in 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 six art or film criticism/history courses 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 will 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 is-

sues 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 to the graduate admissions office on or before January 15, 1994. 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.:

Departmental 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 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 will 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 im-

ages 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.

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: none.* 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: VA 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. 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: VA 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 VA 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 audi-

ences. 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: VA 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: VA 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 VA 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. *Prerequisite: VA 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: VA 105A and one additional upper-division drawing course or consent of instructor.*

105D. Life Drawing (4)

Using both nude and clothed models, the course explores the body as a human language that can be read and depicted from study of the body's stance, gesture, intention, and style. *Prerequisites: two upper-division drawing courses, 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: VA 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: VA 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 VA 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: VA 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: VA 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: VA 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: VA 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 VA 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: VA 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: VA 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: VA 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: VA 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: VA 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:* VA 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:* VA 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:* VA 106A, VA 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:* VA 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 *Aesthetics*, Kirkegaard's *Either/Or*, and Nietzsche's *Birth of Tragedy*. Art critical writings will include selections from Diderot, Winckelmann, Reynolds, Stendhal, Baudelaire, Champfleury, Mallarmé, 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, Heidegger, Wittgenstein, and Cavell, Marxist critics such as Marx, Engels, 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 (VA 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 (VA 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 (VA 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 (VA 11) or Roman Art (VA 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 (VA 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 (VA 11) or Western Art II (VA 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 Dürer and Holbein, Veronese and El Greco mastered, used, and refined the visual language these earlier geniuses had created. *Prerequisite: none; Western Art II (VA 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 co-existence 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 (VA 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 (VA 12) or Renaissance Art (VA 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 (VA 12) or Renaissance Art (VA 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 meanings. *Prerequisite: one upper-division course in Renaissance art; Art Historical Methods (VA 112) or High Renaissance Art (VA 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 (VA 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 (VA 11) or Western Art II (VA 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 (VA 11) or Western Art II (VA 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 (VA 11) or Western Art II (VA 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 (VA 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 (VA 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 Dürer, 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 (VA 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 (VA 11) or Western Art II (VA 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 Velasquez. Each student will prepare a class presentation and will submit a research paper. *Prerequisite: Western Art II (VA 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 (VA 12) or Nineteenth- and Twentieth-Century Art (VA 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 (VA 12) or Nineteenth- and Twentieth-Century Art (VA 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, Taelber-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 (VA 12) or Nineteenth- and Twentieth-Century Art (VA 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 (VA 12) or Nineteenth- and Twentieth-Century Art (VA 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 (VA 12) or Nineteenth- and Twentieth-Century Art (VA 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 (VA 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, Wig-

man, 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 (VA 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 (VA 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 (VA 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 (VA 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 (VA 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 (VA 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 (VA 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 (VA 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 VA 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.

VISUAL ARTS

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 (VA 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 quar-

ter will be devoted to major projects specified by students, and to class discussion of issues arising in the design of those projects. *Prerequisites: VA 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 explore 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: VA 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 Dalí, Maya Deren, Stan Brakhage, and Michael Snow will be examined in depth. Materials fee required. *Prerequisite: VA 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: VA 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; VA 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: VA 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: VA 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: VA 14, 84, and 111.*

158. Critical History of Twentieth-Century Photography (4)

The course will begin with a sketch of the early nineteenth-century background of the origins of photography and will articulate a number of the fundamental issues raised by it. It will then concentrate on the development of the medium from Stieglitz's Photo Secession to the present, emphasizing such

critical issues as the factuality, truthfulness, or representation adequacy raised by the history of the genre, as well as its claims to art or craft status and the related questions of expressive capacity, relation to notions of taste, technical excellence, or stylistic significance. These will be studied in the context of the development of commercial and mass media uses of photography in the twentieth century. *Prerequisite: none.*

164. Photographic Strategies (4)

An introduction to the aesthetic problems in photography. Portfolio required for admission. Materials fee required. *Prerequisites: VA 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: VA 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: VA 60, 165, 167, and consent of instructor.*

168. Color Techniques in Photography (4)

Instruction in color photography and printing. Lectures on theory and demonstrations in shooting and printing color negatives. Portfolio required for admission. Materials fee required. *Prerequisites: VA 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: VA 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: VA 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: VA 1 or 2 or 3, 14, 60, 70, 71, 84, 174; VA 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: VA 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 VA 164, 165, 172, 176, 177; VA 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: VA 174 and three of the following courses, depending on emphasis: VA 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: VA 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 VA 164, 165, 172, 176, 177; VA 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: VA 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: VA 186 and consent of instructor.*

188. Optical Printing (4)

An intensive, hands-on 16mm production workshop utilizing the facilities of the Department of Visual Arts' special effects lab. The course, which is moderately technical in nature, is fundamentally concerned with the meaning of filmic manipulation through time. Numerous class exercises. Enrollment limited to sixteen students. May be repeated once for credit. *Prerequisites: VA 60 and 186 or 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: VA 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 at-

tend 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 Donnés* . . . 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-representation and the textuality of art; the function and significance of quotation and appropriation in art; and media specific approaches to art. Required of first-year students.

295. Individual Studies for Graduate Students (1-12)

Individual research for graduate students in preparation for their comprehensive exhibitions for the M.F.A. degree.

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.

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.*

THE SCHOLARS PROGRAM

OFFICE: Warren Scholars Program, Literature Building, Second Floor, Warren College

Warren Scholars is a four-year program offering an interdisciplinary academic curriculum and special activities that foster close student-faculty interaction, promote a sense of community, and enrich undergraduate education and student campus life. The Scholars Program offers students educational, cultural, and social experiences designed to help students broaden their intellectual interests beyond their major. The Michael Addison Award is given to the scholar with the most distinguished research paper. Each scholar completing the program receives a transcript notation on UCSD records certifying completion of the Warren Scholars Program and is given special honors during graduation ceremonies.

ELIGIBILITY REQUIREMENTS

Eligibility requirements are a high school GPA of 3.8 and an SAT score of 650 in verbal and 650 in mathematics, for entering freshmen only. To maintain status in the Scholars Program, all students must be on the Provost's Honor List at least one quarter per year. All students with outstanding academic credentials are encouraged to apply by writing to: Warren Scholars Program, Warren College, 0422, UCSD, La Jolla, CA 92093.

ACADEMIC PROGRAM

In the freshman year scholars will enroll in a Warren Scholars Seminar (Warren 11A-11B) fall and winter quarters. Each of the two seminars will focus on an interdisciplinary study. These courses will replace the required Warren College writing courses.

In the junior or senior year scholars must write a research paper on a subject outside their own disciplinary area. Scholars may replace one upper-division course in a minor (program of concentration or area study) with an independent study 199, in conjunction with the research project.

Scholars may choose to complete a teaching assistant apprenticeship for Warren Scholars seminars, 11A or 11B, to acquire "hands-on" experience as teachers.

SPECIAL ACTIVITIES

Scholars participate in a wide range of activities that promote educational, cultural, and social experiences with faculty and key Warren College staff members. These informal extracurricular events provide opportunities for students to examine shared experiences from the diverse perspectives of their peers and faculty members. Typically, one informal special activity is held each quarter, and each one serves to build and maintain a sense of community among the scholars.

11A-11B. Warren Scholars Seminar (4-4)

The purpose of the Warren College Scholars Seminar is to allow students to develop and refine their expressive and analytical skills by participation in a two-quarter sequence. The emphasis will be on an interdisciplinary approach to a group of texts chosen for this purpose. The subjects will be selected in order to form a coherent and detailed investigation of issues central to the relation of individuals and society. Topics may vary and may include the function of evidence and observation in the formation of theories, the moral dimension of the theorist's role, and the economic implications of ideologies.

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 the Scholars Seminar, Warren 11A or 11B. *Prerequisite: upper-division student in the Warren Scholars Program.*



OFFICE: Building 410, 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

ETHICS AND SOCIETY

OFFICE: Academic Advising, Literature Building, Second Floor, Warren College

Ethics and Society is an interdisciplinary course required of all Warren students entering fall 1985 and thereafter. 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 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, 534-3589

Affiliated Faculty

Professors

- Michael Davidson, Ph.D., *Literature*
- Abraham Dijkstra, Ph.D., *Literature*
- Page duBois, Ph.D., *Literature*
- Frances Foster, Ph.D., *Literature*
- Judith Hughes, Ph.D., *History*
- Helene Keyssar, Ph.D., *Communication*
- Susan Kirkpatrick, Ph.D., *Literature*
- Masao Miyoshi, Ph.D., *Literature*
- Louis Montrose, Ph.D., *Literature*
- Chandra Mukerji, Ph.D., *Sociology/Communication*
- Carol Plantamura, M.F.A., *Music*

Associate Professors

- Rae Blumberg, Ph.D., *Sociology*
- Ann Craig, Ph.D., *Political Science*
- Susan G. Davis, Ph.D., *Communication*
- DeeDee Halleck, Ph.D., *Communication*
- Stephanie Jed, Ph.D., *Literature*
- Rebecca Klatch, Ph.D., *Sociology*
- Rachel Klein, Ph.D., *History*
- Lisa Lowe, Ph.D., *Literature*
- Babette Mangolte, Ph.D., *Visual Arts*
- Carol Padden, Ph.D., *Communication*
- Fitz John Porter Poole, Ph.D., *Anthropology*
- Marta Sanchez, Ph.D., *Literature*
- Rosaura Sanchez, Ph.D., *Literature*
- Kathryn Shevelow, Ph.D., *Literature*
- Shirley Strum, Ph.D., *Anthropology*
- Jehanne Teilhet-Fisk, Ph.D., *Visual Arts*
- Cynthia Walk, Ph.D., *Literature*

Assistant Professors

- Suzanne Brenner, Ph.D., *Anthropology*
- Lisa Catanzarite, Ph.D., *Sociology*
- Rosemary George, Ph.D., *Literature*
- Judith Halberstam, Ph.D., *Literature*
- Valerie Hartouni, Ph.D., *Communication*
- Beth Holmgren, Ph.D., *Literature*
- Christine Hunefeldt, Ph.D., *History*
- Dorothy Ko, Ph.D., *History*
- Todd Kontje, Ph.D., *Literature*

- Martha Lampland, Ph.D., *Sociology*
- Stephanie McCurry, Ph.D., *History*
- Michael Meranze, Ph.D., *History*
- Pamela Radcliff, Ph.D., *History*
- Roddey Reid, Ph.D., *Literature*
- Susan Smith, Ph.D., *Visual Arts*
- Paule Cruz-Takash, Ph.D., *Ethnic Studies*
- Nicole Tonkovich, Ph.D., *Literature*
- Cynthia Truant, Ph.D., *History*
- Winifred Woodhull, 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. Students who declare the women's studies major with junior or senior standing may, if they wish, petition to substitute three comparable upper-division women's studies courses for this introductory sequence.

MAJOR PROGRAM

Concentration in History

Group A. **Seven upper-division women's studies courses (twenty-eight units) in history**, five of which must be chosen 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 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**, five of which must be chosen 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 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**, five of which must be chosen 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, Visual Arts) to be selected from the Women's Studies approved 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.

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 four

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 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. 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. 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.

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 129. Female, Male, and Gender: The Cultural Shape and Social Force of Sexual Difference (4)

Course explores how sexual differences are culturally constructed and how such gender constructs become socially significant in various domains of community life and psychologically significant in the formation of personal identity. Both anthropological and feminist studies are examined. *Prerequisite: ANLD 22 or equivalent.*

ANRG 117. Gender across Cultures (4)

This course explores the construction of 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, religion, and politics. *Prerequisite: ANLD 22 or consent of instructor.*

ANRG 166. Family and Society in the Near East (4)

An introduction to the historical and sociological study of societies with Islamic traditions and a discussion of the social and political problems associated with such societies. *Prerequisite: ANLD 22 or equivalent.*

CMCU 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 the women to serve as data for class analysis; and (3) writing final paper on the stereotypes employed in generating these portraits. *Prerequisites: Comm/Cul 100 and Comm/Gen 100-VA 170, or consent of instructor.*

CMCU 115. The Theatre of Private Life: Family and Friends (4)

A close examination of theatre informed by a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisite: Comm/Cul 100 required. Comm/Gen 100-VA 170 recommended or consent of instructor.*

CMCU 116. Feminist Theatre Workshop (4)

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: completion of pre-major, Comm/Cul 100, Comm/Gen 100. Major only or consent of instructor.*

CMCU 137. Politics of Bodies (4)

This course will explore the construction of gendered bodies and gendered sexuality in the late twentieth-century post-industrial cultures. Through the use of film, fiction 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: Comm/Cul 100 or Women's Studies 2A, 2B, or 2C.*

CMCU 138. Feminist Theory (4)

This class is designed to initiate students into the pleasure, 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 2A, 2B, or 2C.*

CMCU 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: Comm/Cul 137 or Women's Studies 2A, 2B, or 2C.*

ET 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.

ET 183. Gender, Race, Ethnicity, and Class (4)

Gender is often neglected in studies of ethnic/racial politics. This seminar explores the relationship of race, ethnicity, class and gender by examining the participation of working class women of color in community politics and how they challenge mainstream political theory.

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.*

HIEU 147. The History of Women in Europe: Middle Ages to the Industrial Revolution (4)

This course deals with changes in women's role, status, and sexual taboos from the beginning of the Middle Ages to 1789.

HIEU 148. The History of Women in Europe: Industrial Revolution to the Present (4)

This course covers the history of women from the Industrial Revolution to the present, focussing on the role of women in radical political movements, the evolution of women's work, and feminism.

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 180/280. Topics in European Women's History (4)

The specific content of the course will vary from year to year, but will always analyze in depth a limited number of issues in European women's history. *Prerequisite: upper-division standing or consent of the instructor. Radcliff*

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 of cultural issues. *Prerequisite: upper-division standing. Hunefeldt*

HILA 161. 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.

HISC 103. Gender and Science in Historical 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.

HITO 164/264. Gender Differences in Historical Perspective (4)

An inquiry into how over the past century a number of disciplines (among them ethology, anthropology, and psychology) have treated gender differences.

WOMEN'S STUDIES

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, and anti-slavery and pro-slavery thought. (May be taken for women's studies credit when the theme of women is a course focus.)

HIUS 131. Cultural History from the Civil War to the Present (4)

This course will focus on the transformation of work and leisure in 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. (May be taken for women's studies credit when the theme of women is a course focus.)

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, the cult of domesticity, sexuality, the rise of industrial capitalism, and the transformation of women's work, the Civil War, and the first feminist movement.

HIUS 157. American Women, American Womanhood 1870 to Present (4)

This course explores the making of the ideology of womanhood in modern America and the diversity of American women's experience from 1870 to the present. Topics include the suffrage movement, the struggle for reproductive rights and the ERA; immigrant and working-class women, women's work, and labor organization; education, the modern feminist movement and the contemporary politics of reproduction, including abortion and surrogate motherhood. *Prerequisite: upper-division standing.*

HIUS 172. Feminist Traditions in America (4)

This course considers three arenas of feminist activity in American history—women's activism, the female intellectual tradition, feminist theory—to explore the diversity of the feminist tradition, and to examine competing definitions of feminism, from the eighteenth century to the present day. Topics will range from abolitionism and temperance to the women's labor movement, from Emily Dickinson and Louisa May Alcott to Toni Morrison, and from Margaret Fuller and Elizabeth Cady Stanton to Betty Friedan, and the ERA. Special topics. *Prerequisite: department stamp or consent of instructor.*

HIUS 173. 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. Department stamp or consent of instructor. (Formerly Hist. 163Q.)

HIUS 177. 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.

LT/EN 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 as topics vary.

LT/EN 146. Women and English/American Literature (4)

Selected topics concerning women and the anglophone literature. Topics include women writers, the literary representation of women and women as readers. May be repeated for credit as topics vary.

LT/EN 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.

LT/EN 185. Themes in Afro-American Literature (4)

An intensive examination of a characteristic theme, special issue, or period in Afro-American literature. May be repeated for credit when topics vary. (May be taken for women's studies credit when the theme of women is a course focus.)

LT/GN 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 as topics vary.

LT/GN 123. Women in Italy (4)

(Same as LT/IT 140.)

A study of historical, political, and literary texts regarding women and feminism in Italian society.

LT/GN 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.

LT/GN 189. Gender Studies (4)

The study of the construction of sexual differences in literature and culture. May be repeated for credit as topics vary.

LT/IT 140. Women in Italy (4)

(Same as LT/GN 123.)

LT/TH 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 as topics vary.

MU 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.*

Poli Sci. 115A. Gender and Politics (4)

Introduction to issues of women, men, and the political process in America. Focus on old and new feminist agendas: role equity, role change; voting behavior; backlash; marginality; gender gap. A special segment on Phyllis Schlafly and the movement STOP-ERA. *Prerequisite: upper-division standing.*

Poli Sci. 115B. Topics in Feminist Theory (4)

Reading course with two short papers covering a selection of major writers and thinkers about gender differences, gender bias, sex-role socialization, language, reproductive freedom, affirmative action, and feminist socialism. Writers will include: de Beauvoir, Millett, Heilbrun, Chodorow, Dinerstein, Brown, Miller, Gilligan, Firestone, Eisenstein, Rich, and others. *Prerequisites: upper-division standing.*

Poli Sci. 115C. Topics in Gender and Public Policy (4)

This course will cover several areas that impinge on science, technology and gender, including: women, politics and war, re-

productive technologies, toxics, childbearing vulnerabilities, mathematics ability and disability-genetics, hormones, and socialization. Students will be required to research and write a twenty-five- to thirty-page paper in one of these areas in addition to taking a final examination. *Prerequisite: upper-division standing.*

Poli Sci. 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: Poli Sci. 11 or consent of instructor.*

Poli Sci. 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: P.S. 10 or consent of instructor.*

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/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.

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.

Soc/C 175G. Race/Ethnicity, Gender and Labor Markets (4)

Exploration and analysis of the 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/D 120W. Women in Comparative Perspective (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, socio-political, 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 U.S.A.; and the political economy of sex stratification.

VA 123H. Images of Women in Medieval and Renaissance Art (4)

Images of women were central to medieval and Renaissance art, reflecting the importance of women in the religious and social theories of the times. Eve, the first woman, and Mary, mother of God, were two archetypes which dominated the period's view of women, but saints, witches, goodesses, and courtly ladies also figured prominently in the art of churches, palaces, and towns.

This course explores what this rich variety of images reveals about medieval and Renaissance attitudes towards women; what role images of women played in the culture of daily life; and what impact they have had on representations of women in later art. *Prerequisites: none. Western Art II (VA 12); Art of the Middle Ages (VA 122A), and/or Art of the Renaissance (VA 122B) recommended.*

VA 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.*

UCSD EQUAL EMPLOYMENT OPPORTUNITY (EEO)/ AFFIRMATIVE ACTION POLICY 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.

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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 Student Government/Student Organizations
- College Dean Offices
- Office of Graduate Studies and Research
- Office of the Student Affairs Dean, School of Medicine
- Office of the Student Conduct Coordinator

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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:

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Questions about these rights should be referred to the director, UA/Special Services, Nick Aguilar, in Bldg. B of the Student Center, telephone 534-6225. Copies of the Federal Act and the full text of the UC policies are available at that office.

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 INFORMATION-UCSD
 BACHELOR'S DEGREE
 RECIPIENTS**

The salary averages are figured according to occupational classifications.

**workforce immediately after graduation.
 Survey conducted of June 1991 gradu-
 ates in December, 1991.**

**UCSD FACTS AND FIGURES
 (AS OF FALL 1992)**

On-campus student enrollment

The employment status of the graduates who sought to enter the workforce is as follows:

Employed full time	77%
Employed part time	12%
Seeking employment	9%

Source: *UCSD Graduates—A Summary of 1991 Survey Results*. Information based only on those who sought to enter the workforce immediately after graduation. Survey conducted of June 1991 graduates in December, 1991.

**UCSD FACTS AND FIGURES
 (AS OF FALL 1992)**

On-campus student enrollment

Undergraduate	14,749
Muir	3,570
Revelle	3,144
Third	3,066
Warren	3,297
Fifth	1,672
Graduate	2,491
Medical School (excluding 481 Medical Center residents and interns)	520
Total Students	18,241

On-campus teaching faculty

members 1,656

Members of Honorary Societies/Prizes/Awards

American Academy of Arts and Sciences fellows	62
American Philosophical Society fellows	10
Econometric Society fellows	8
Fields Medal Recipients	1
Guggenheim fellows	108
Institute of Arts and Letters	3
Institute of Medicine members	10
International Academy of Astronautics members	7
National Academy of Education members	3
National Academy of Engineering members	12
National Academy of Sciences members	54
National Medal of Science recipients	6
Nobel Prize laureates	6
Pulitzer Prize Recipients	1

Total land area—UCSD

Main campus	1,157
Outlying areas	404
UC Natural Reserves	414
Total acres	1,975

Books in library collection 2,188,722
 UCSD Extension enrollment 26,869

Grade-point averages

Lower-division undergraduate	2.94
Upper-division undergraduate	2.98
Graduate	3.68

Number of undergraduates in most popular majors

Biology	2,980
Applied Mechanics and Engineering Sciences	1,576

Psychology	1,080
Political Science	1,004
Economics	819
Communication	652
Electrical and Computer Engineering	623
Literature	585
Computer Science and Engineering	477
Chemistry	360
Visual Arts	343
Mathematics	328
Physics	315

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.

**University of California,
San Diego**

General Catalogs,

1993/1994

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CAMPUS MAP



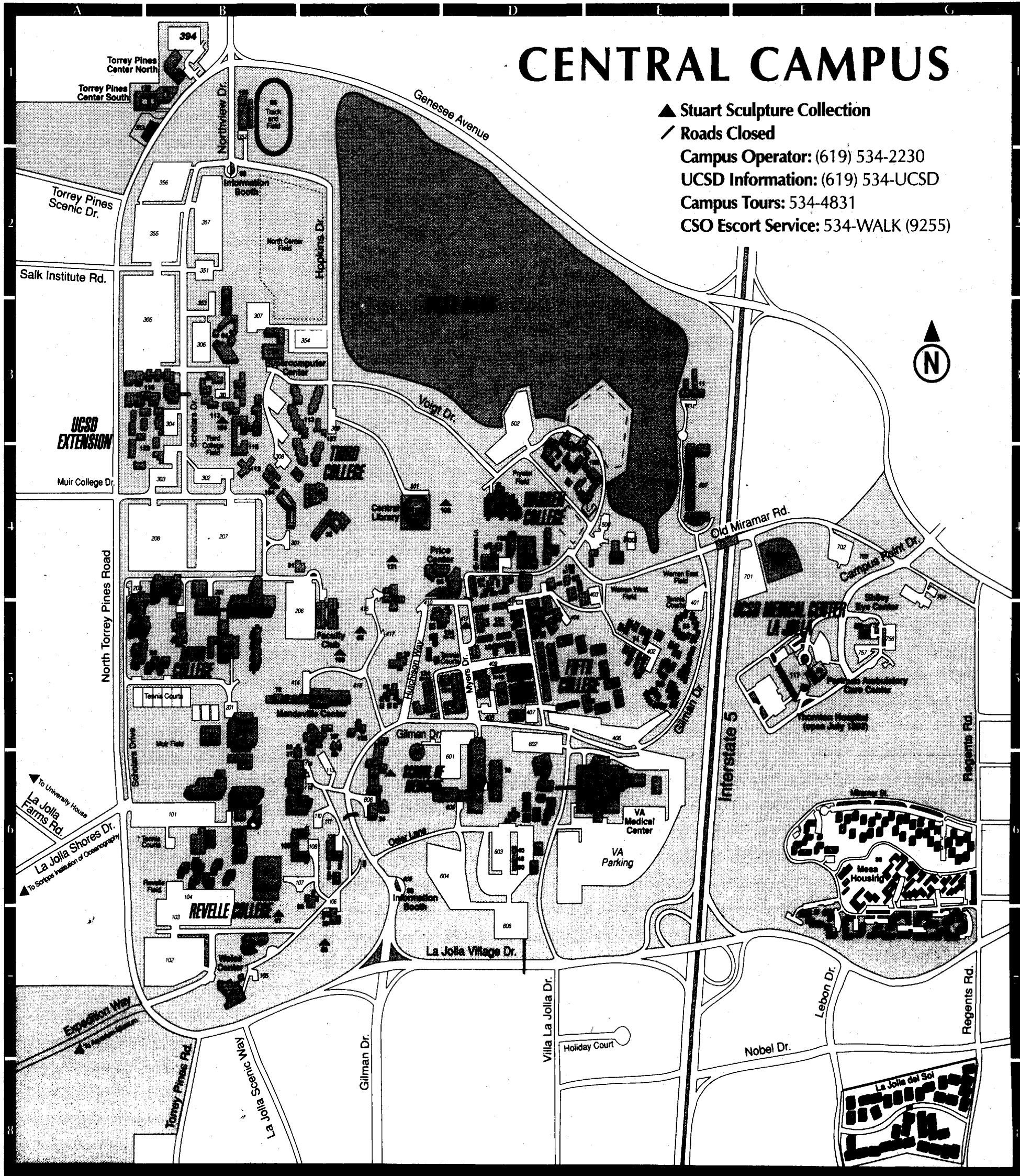
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6	Neurosciences Dept., Basic Science Bldg.	D6
101	Ophthalmology Dept., Shiley Eye Center	F5
124	Parking and Transportation Services, Bldg. 400 University Center	D5
6	Pathology Dept., Basic Science Bldg.	D6
	Patient Services	
21	Cardiology, Cedar	D6
31	Clinical Research Programs, Clinical Research Facility	D6
78	Genetics, Medical Genetics Bldg.	D6
84	Head and Neck, Multispecialty Practice Facility	D6
61	Internal Medicine, Internal Medicine Group	D6
101	Ophthalmology, Shiley Eye Center	F5
33	Orthopedics, Clinical Services Bldg.	D6
84	Pediatrics, Multispecialty Practice Facility	D6
21	Pharmacy, Cedar	D6
33	Radiology, Clinical Services Bldg.	D6
84	Reproductive Medicine, Multispecialty Practice Facility	D6
21	Senior Care, Cedar	D6
33	Urgent Care, Clinical Services Bldg.	D6
48	Pediatrics Dept., Evergreen	D6
	Personnel	
124	Academic, Bldg. 402 University Center	D5
120	Staff, Torrey Pines Center South	A1
6	Pharmacology Dept., Basic Science Bldg.	D6
52	Philosophy Dept., Galbraith Hall	B6
55	Physical Education Dept., Gymnasium	B5
127	Physics Dept., Urey Hall Addition	B6
124	Police, Bldg. 500 University Center	D4
115	Political Science Dept., Third College Humanities Bldg.	B4
93	Post Office, Price Center	D4
76	Psychology Dept., McGill Hall	B5
19	Recreation Office, Canyonview Aquatic and Racquetball Facility	E4
124	Registrar, Bldg. 301 University Center	D5
	Revelle College Residence Halls	B6
97	Revelle Formal Lounge, Revelle Commons	B6
	School of Medicine	
79	Admissions, Medical Teaching Facility, rm. 162	D6
48	Continuing Medical Education, Evergreen	D6
6	Dean's Office, Basic Science Bldg./Adm. Wing	D6
79	Financial Aid, Medical Teaching Facility, rm. 166	D6
79	Student Affairs, Medical Teaching Facility, rm. 180	D6
124	Social Sciences, Dean's Office, Bldg. 202 University Center	C5
58	Sociology Dept., Humanities and Social Sciences Bldg.	B5
6	Southwest Electron Microscopy Resource, Basic Science Bldg.	D6
32	Stein Institute for Research on Aging, Clinical Sciences Bldg.	D6
	Stuart Collection	
44	Drinking Fountain, Michael Asher	D5
65	Irwin Installation, Robert Irwin	C5
67	La Jolla Project, Richard Fleischer	B7
68	La Jolla Vista View, William Wegman	C7
102	Snake Path, Alexis Smith	D4
104	Something Pacific, Nam June Paik	B4
109	Sun God, Niki de Saint Phalle	C5
111	Terrace, Jackie Ferrara	C6
121	Trees, Terry Allen	C4
123	UNDA, Ian Hamilton Finlay	B3
129	Vices and Virtues, Bruce Nauman	D4
93	Student Information (EDNA), Price Center	D4
108	Student Outreach and Recruitment, Student Center, Bldg. B	C5
122	Summer Session, UCSD Extension Complex	A3
124	Teacher Education Program, Bldg. 517 Fifth College	D4
	Theatre Dept., Galbraith Hall	B6
119	University Communications, Torrey Pines Center North	B1
124	Vice Chancellor-Academic Affairs, Bldg. 105 University Center	D5
124	Vice Chancellor-Administration, Bldg. 109 University Center	D5
124	Vice Chancellor-Business Affairs, Bldg. 110 University Center	D5
6	Vice Chancellor-Health Sciences, Basic Science Bldg.	D6
124	Vice Chancellor-Student Affairs, Bldg. 112 University Center	D5
73	Visual Arts Dept., Mandeville Center	C5
69	Warren College Provost, Literature Bldg.	D4
278		

SERVICES, CENTERS, INSTITUTES, AND ACADEMIC AND ADMINISTRATIVE DEPARTMENTS

CENTRAL CAMPUS

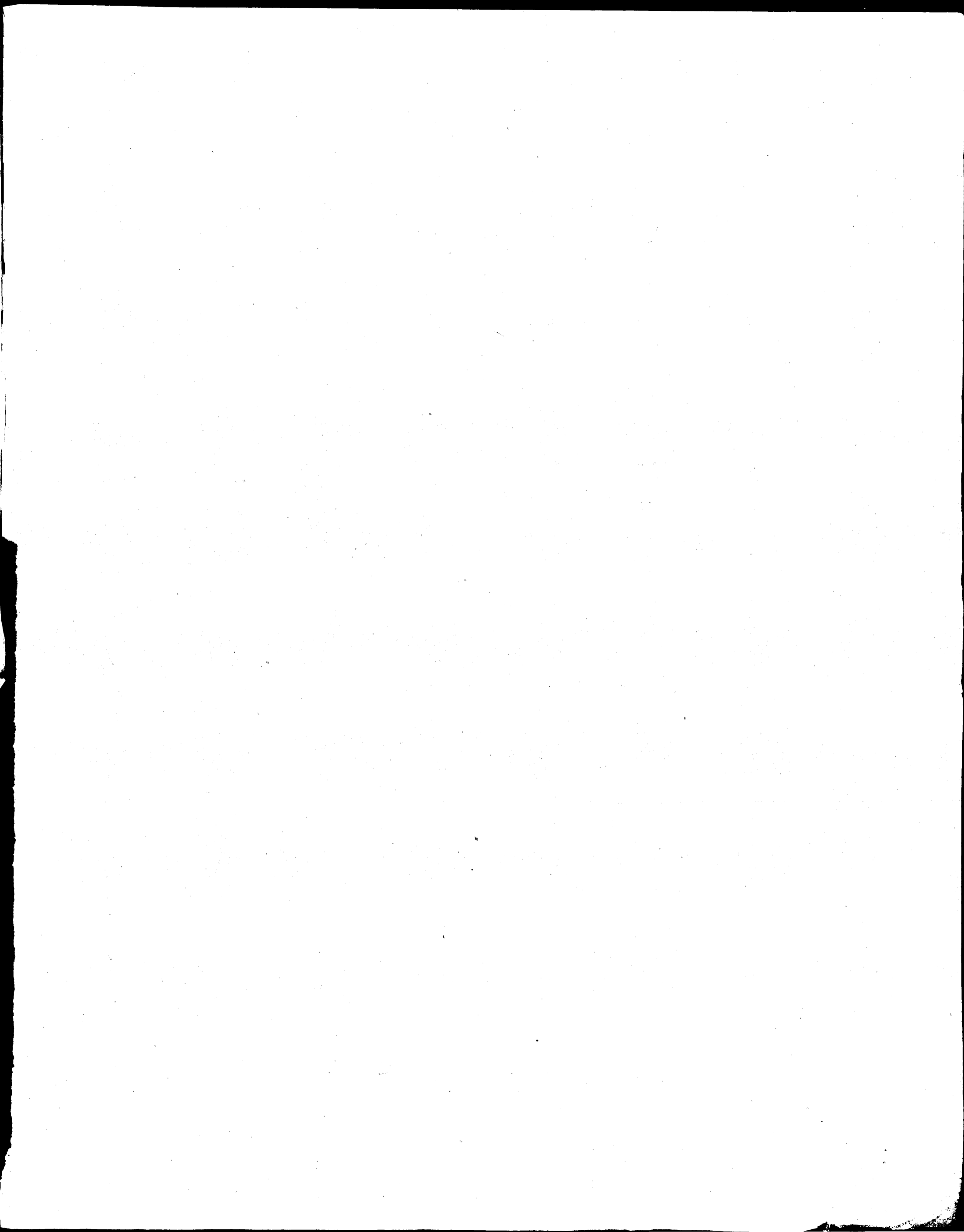
- ▲ Stuart Sculpture Collection
- ／ Roads Closed
- Campus Operator: (619) 534-2230
- UCSD Information: (619) 534-UCSD
- Campus Tours: 534-4831
- CSO Escort Service: 534-WALK (9255)

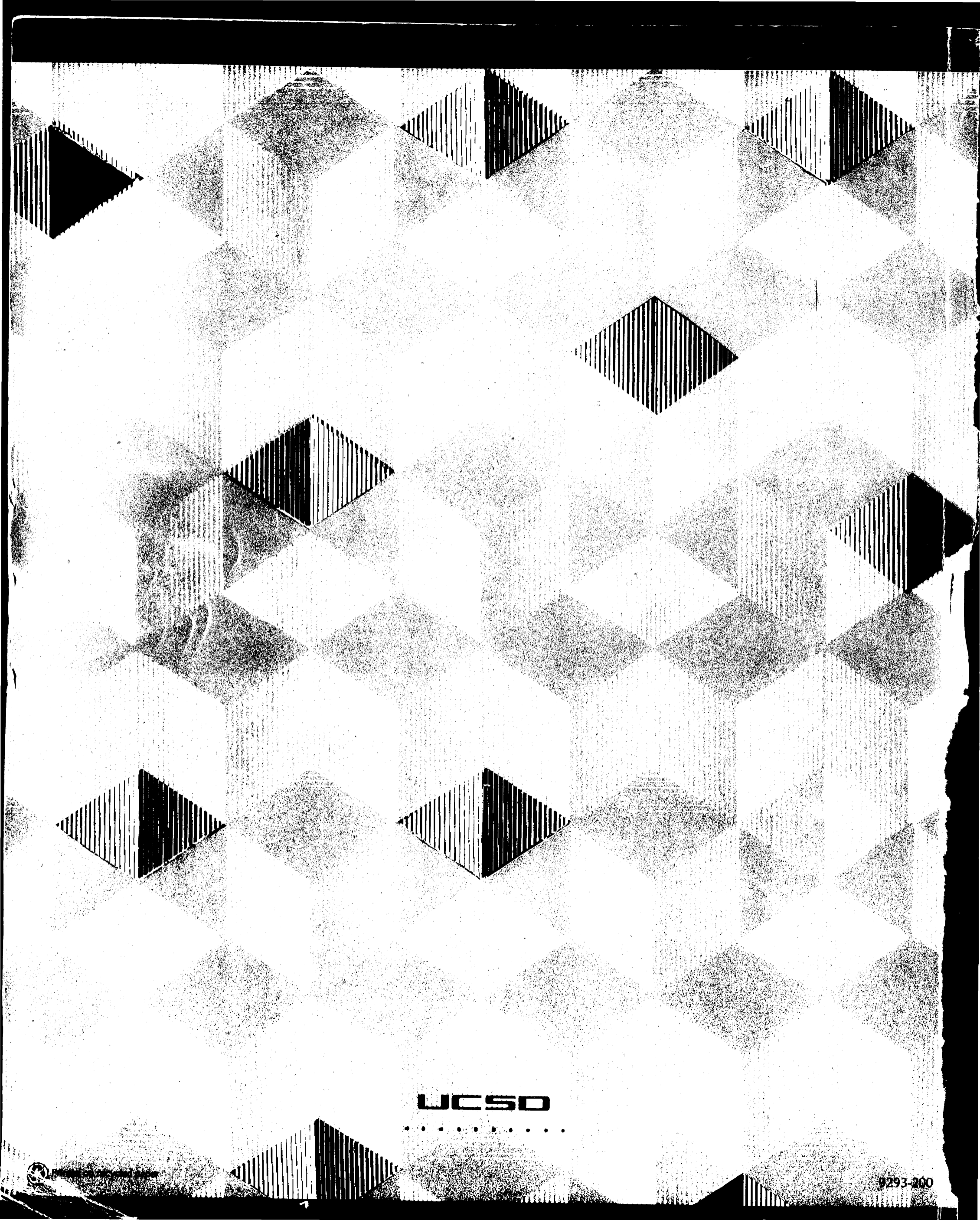


▲ To University House
 La Jolla Farms Rd.
 ▲ To Scripps Institution of Oceanography
 La Jolla Shores Dr.

Expedition Way
 ▲ To Scripps Institution of Oceanography

La Jolla del Sol
 Mens Housing





UCSD

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