

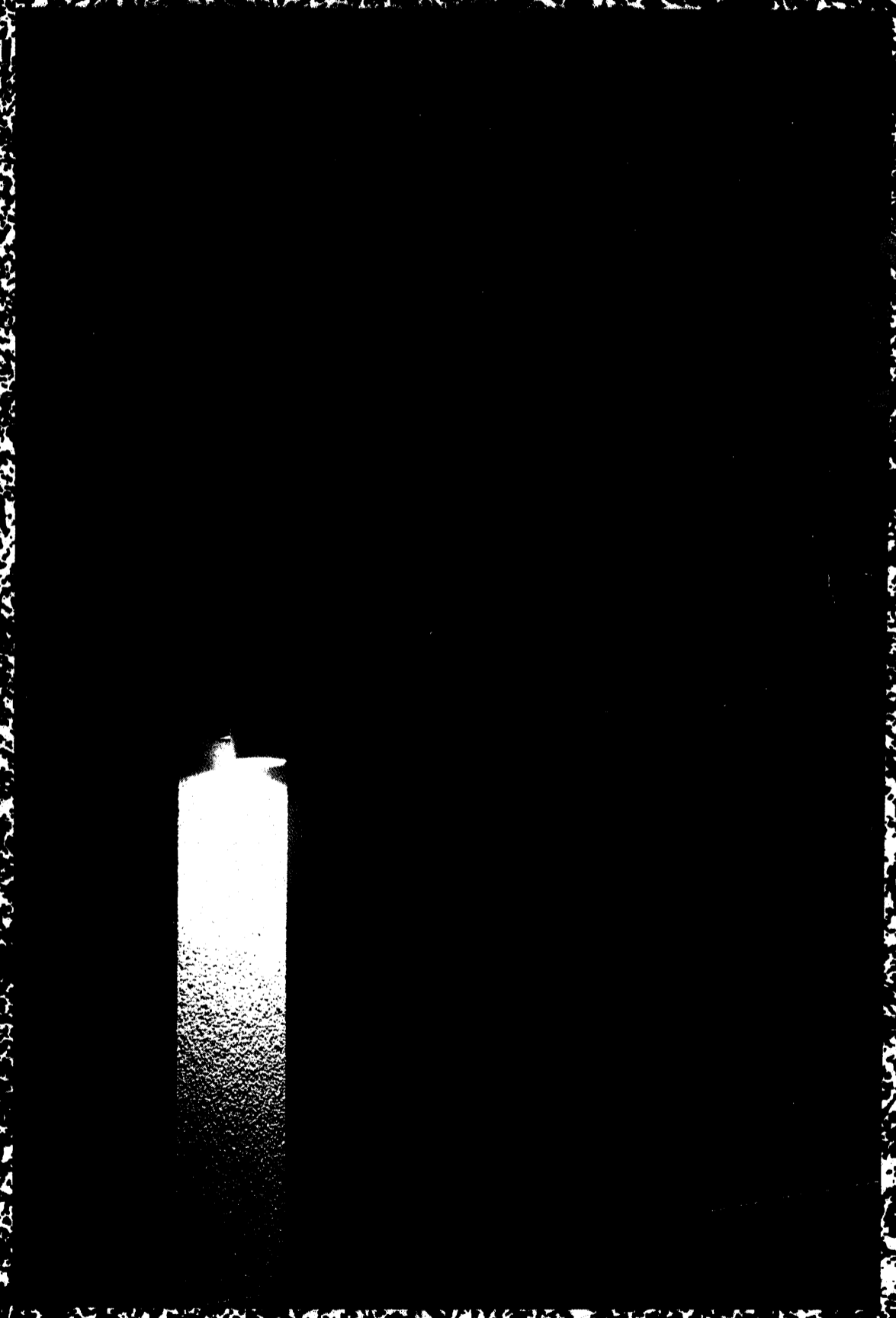
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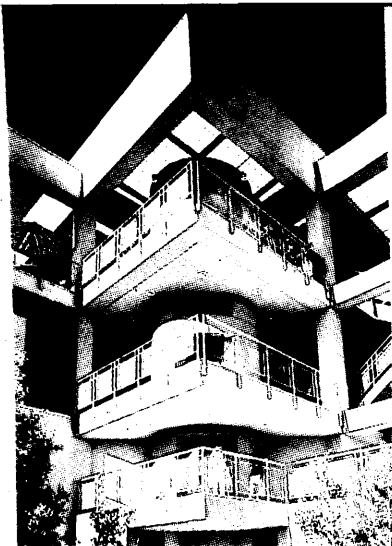
1990

1991

UNIVERSITY OF CALIFORNIA
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The cover photo is a detail of Third College's Oceanview Terrace, shown at left.

CORRESPONDENCE DIRECTORY

Campus Directory Information

(619) 534-2230

UNDERGRADUATE

Admissions	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, Q-021-A, (619) 534-3160
Educational Opportunity Program (EOP)	Student Outreach and Recruitment Office	Student Center, Building B, B-037, 534-4831
Financial Aids (Loans and Grants)	Student Financial Services	Building 210, Matthews Administrative and Academic Complex, Q-013, 534-4480
Foreign Students' Affairs	Office of International Education	International Center, Q-018, 534-3730
Housing On-Campus Off-Campus	Housing Administration Office of Housing Services	Building 206, Matthews Administrative and Academic Complex, Q-041, 534-4010 Student Center Building B, B-009, 534-3670
Part-Time Employment On-Campus Off-Campus	Career Services Center	Career Services Center, B-030, 534-4500
Provosts Fifth College Muir College Revelle College Third College Earl Warren College	Building 202 H&SS Building, Room 2126 Revelle Provost Building Third College Admin. Building Building 302	Matthews Administrative and Academic Complex, Q-069, 534-2235 Muir Campus, C-006, 534-3583 Revelle Campus, B-021, 534-3262 Third Campus, D-009, 534-4002 Matthews Administrative and Academic Complex, Q-022, 534-4350
Registration	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, Q-021-A, 534-3150
Residence Status	Registrar & Admissions	Building 301, Matthews Administrative and Academic Complex, Q-021-A, 534-3152
Scholarships	Student Financial Services	Building 214, Matthews Administrative and Academic Complex, Q-013, 534-4480
Student Activities	Price Center	Price Center, Q-078, 534-4090

GRADUATE

Dean of Graduate Studies and Research	Office of Graduate Studies and Research	Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3555
Admissions	(Address the appropriate department of instruction.)	
Affirmative Action	Office of Graduate Studies and Research	Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3871
Fellowships	Office of Graduate Studies and Research	Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3556
Financial Aids (Loans and Grants)	Student Financial Services	Building 210, Matthews Administrative and Academic Complex, Q-013, 534-3807
Graduate Women's Program	Office of Graduate Studies and Research	Building 409, Matthews Administrative and Academic Complex, Q-003, 534-3550
Housing	Graduate Apartments, Residential Apartments Office	9224 B Regents Road, S-007, 534-2952
Teaching and Research Assistantships	(Address the appropriate department of instruction.)	

SCHOOL OF MEDICINE

Admissions	Admissions Office	162 Medical Teaching Facility, M-021, 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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General Catalog
1990-91

University of California,
San Diego

Price: \$3.50
By Mail: \$4.75

ACADEMIC AND ADMINISTRATIVE CALENDAR, 1990-91

Fall Quarter, 1990

Fall quarter begins	Wednesday, September 19
Instruction begins	Monday, September 24
Thanksgiving holiday	Thursday-Friday, Nov. 22-23
Instruction ends	Friday, November 30
Final exams	Monday-Saturday, December 3-8
Fall quarter ends	Saturday, December 8
Christmas holidays	Monday-Tuesday, Dec. 24-25
New Year holidays	Monday-Tuesday, Dec. 31-Jan. 1

2

Winter Quarter, 1991

Winter quarter begins	Wednesday, January 2
Instruction begins	Friday, January 4
Martin Luther King, Jr. holiday	Monday, January 21
Presidents' Day holiday	Monday, February 18
Instruction ends	Friday, March 15
Final exams	*Monday-Saturday, March 18-23
Winter quarter ends	Saturday, March 23
Academic and administrative holiday	Monday, March 25

Spring Quarter, 1991

Spring quarter begins	Friday, March 29
Instruction begins	Monday, April 1
Memorial Day holiday	Monday, May 27
Instruction ends	Friday, June 7
Final exams	Monday-Saturday, June 10-15
Spring quarter ends	Saturday, June 15
Commencement	Sunday, June 16
Independence Day holiday	Thursday, July 4
Labor Day holiday	Monday, September 2

CATALOG EVALUATION

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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.

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.

Name _____

Street _____ City _____

State _____ Zip Code _____

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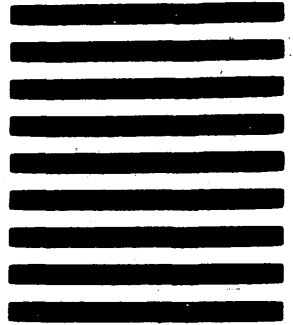
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UNDERGRADUATE ADMISSION INFORMATION AND ENROLLMENT DEADLINES

	Fall Quarter 1990	Winter Quarter 1991	Spring Quarter 1991
ADMISSION Opening date for filing application materials	Nov. 1, '89	July 1, '90	Oct. 1, '90
PRIORITY DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	March 2	Nov. 1	Feb. 1
TELEPHONE PRIORITY ENROLLMENT: CONTINUING STUDENTS	May 9-26	Oct. 31-Nov. 15	Feb. 13-28
NEW STUDENTS Enrollment completed by	Sept. 18	Dec. 21	March 22
LATE-ENROLLMENT Last day to enroll without \$50 late enrollment penalty fee	Sept. 19	Dec. 21	March 22
FEES DUE Fees are due and payable upon receipt of Registration form. See Late Penalties Section.			
QUARTER BEGINS	Sept. 19	Jan. 2	March 29
INSTRUCTION BEGINS	Sept. 24	Jan. 4	April 1
ALL STUDENTS: LATE REGISTRATION Payment of fees after this date requires payment of \$50 penalty fee Enrollment and payment of fees after this date requires college approval, payment of \$50 for late enrollment and \$50 for late payment of fees, totaling \$100.	Sept. 24	Jan. 4	April 1
DEADLINE FOR CHANGE OF PROGRAM			
Adding Courses	Oct. 5	Jan. 18	April 12
Dropping courses without late fee	Oct. 5	Jan. 18	April 12
Changing to or from P/NP	Oct. 5	Jan. 18	April 12
Dropping course without "W" appearing on transcript	Oct. 19	Feb. 1	April 26
Dropping courses without penalty of "F" grade	Nov. 26	March 8	May 31
INSTRUCTION ENDS	Nov. 30	March 15	June 7
FINAL EXAMINATIONS	Dec. 3-8	March 18-23	June 10-15
DEADLINE FOR REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 11	March 27	June 18
QUARTER ENDS	Dec. 8	March 23	June 18
COMMENCEMENT			June 16
GRADES MAILED TO ALL STUDENTS (APPROXIMATE)	Jan. 3	April 10	July 2

Dates are subject to change without notice.

GRADUATE ADMISSION INFORMATION

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	Fall Quarter 1990	Winter Quarter 1991	Spring Quarter 1991
ADMISSION Applicants should check with their prospective departments for deadline dates			
APPLICATIONS FOR FELLOWSHIPS: Deadline date for filing application materials	Jan. 15 '91		
Notice of Awards	April 1		
Acceptance of Awards	April 15		
NOTE: Most departments adhere to the above for assistantships also, but many will accept later applications			
6 DEADLINE FOR APPLICATIONS FOR FINANCIAL AID	June 1	Nov. 1	Feb. 1
▼ TELEPHONE PRIORITY ENROLLMENT: CONTINUING STUDENTS	May 9-26	Oct. 31-Nov. 15	Feb. 13-28
APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM	Aug. 21	Dec. 6	March 1
FILING APPROVED LEAVE OF ABSENCE	Oct. 8	Jan. 18	April 15
SCHOOL OF MEDICINE DEADLINES (Refer to School of Medicine announcement for deadlines)			
LATE ENROLLMENT Last day to enroll without \$50 late enrollment penalty fee	Sept. 19	Dec. 21	March 22
QUARTER BEGINS	Sept. 19	Jan. 2	March 29
INSTRUCTION BEGINS	Sept. 24	Jan. 4	April 1
LATE REGISTRATION Last day to pay fees without a \$50 late fee	Sept. 24	Jan. 4	April 1
Enrollment and payment of fees after this date requires a General Petition and payment of \$50 for late enrollment and \$50 for late payment of fees, totaling \$100.	Oct. 5	Jan. 18	April 12
DEADLINE FOR CHANGE OF PROGRAM Adding or dropping courses without \$3 penalty	Oct. 5	Jan. 18	April 12

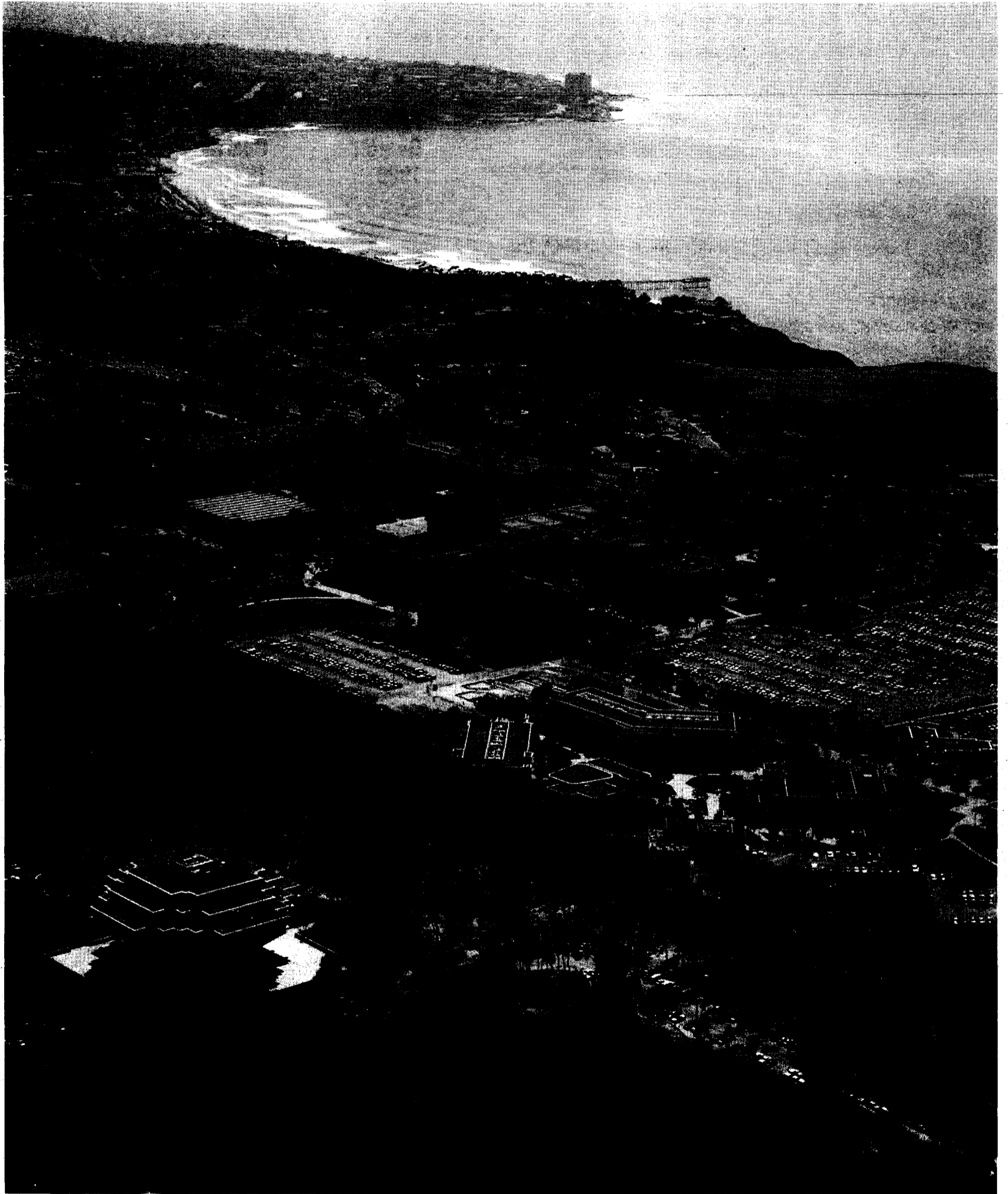
Dates are subject to change without notice.

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AND ENROLLMENT DEADLINES

	Fall Quarter 1990	Winter Quarter 1991	Spring Quarter 1991
CHANGE OF GRADING OPTION	Oct. 5	Jan. 18	April 12
DEADLINE FOR DROPPING CLASSES WITHOUT "W" APPEARING ON THE TRANSCRIPT	Oct. 19	Feb. 1	April 26
MASTER'S DEGREE Filing for advancement to candidacy Filing approved thesis	Oct. 3 Nov. 30	Jan. 16 March 15	April 12 June 7
DOCTOR OF PHILOSOPHY DEGREE Filing draft dissertation with doctoral committee Filing approved dissertation and related materials	Nov. 2 Nov. 30	Feb. 15 March 15	May 10 June 7
GRADUATE RECORD EXAMINATION (GRE) TEST DATES	Oct. 13 Dec. 8	Feb. 2	April 20 June 8 (General Only)
DROPPING CLASSES WITHOUT PENALTY OF "F" GRADE	Nov. 26	March 8	May 31
INSTRUCTION ENDS	Nov. 30	March 15	June 7
FINAL EXAMINATIONS	Dec. 3-8	March 18-23	June 10-15
REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 10	March 25	June 17
QUARTER ENDS	Dec. 8	March 23	June 15
COMMENCEMENT			June 16
COMPLETION OF REQUIREMENTS Final date for completion of all requirements for degrees to be awarded at end of quarter	Dec. 7	March 22	June 7
GRADES DISTRIBUTED TO ALL STUDENTS (APPROXIMATE)	Jan. 3	April 4	July 3

Dates are subject to change without notice.



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 are offered in a wide range of disciplines, leading 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 was approved by the Regents in 1986, and is the only school of international affairs in the UC system. The Regents approved a new School of Architecture in 1988, and its curriculum is currently in the planning stages; it should accept 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 five Nobel laureates (four of whom hold joint appointments with the nearby Salk Institute); one winner of the Fields Medal in mathematics; three recipients of the National Medal of Science; one winner of the Pulitzer Prize; fifty members of the National Academy of Sciences; fifty-four Fellows of the American Academy of Arts and Sciences; nine Fellows of the American Philosophical Society; five fellows of the Econometric Society; ten members of the National Academy of Engineering; seven members of the International Academy of Astronautics; eight 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.

Nationwide, UCSD ranks second only to the California Institute of Technology in the ratio of National Academy of Sciences members to total faculty, with a ratio of one NAS member in ten faculty.

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. A survey published by the education editor of *The New York Times* listed UCSD among the nation's top-ranking institutions. Of the 265 colleges and universities evaluated for "academics, quality of life, and social life," UCSD ranked among the top fifteen. UCSD shared that rating-level with

INTRODUCTION

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such venerable and renowned institutions as Harvard, Yale, Smith, and Wellesley.

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 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. The excellence of the faculty at the graduate level affects the style and quality of instruction at all levels of the institution, including the undergraduate.
- In recent statistics, UCSD ranked first in the United States in the dollar value of funds received from the National Science Foundation for research, and first in the nation in the dollar value of total federal research and development funding from all agencies.
- UCSD's retention rate. Of all undergraduates enrolled each fall quarter who do not receive degrees during the year, more than 80 percent return the next fall. This returning-student percentage has increased substantially during the past several years, reflecting expanded academic programs, improvements in undergraduate course offerings, and overall improvement in the quality of student life on campus.
- 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, and the 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 skills in the computer field which 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 Litera-

ture, 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 are available which utilize the combined resources of two or more departments. Among these are Chicano Studies, Chinese Studies, Classical Studies, Japanese Studies, the Teacher Education Program, Third World Studies, and Urban Studies and Planning.

Engineering students may choose from a number of majors in the Department of 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 premed students, the common choices are biology, chemistry, psychology, and bioengineering (AMES). However, more and more students are electing double majors, or are combining non-traditional 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 are available in the Career Services Center, and in Psychological and Counseling Services, to help you appraise your personal aptitudes.

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

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

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

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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
Linguistics
Political Science
Psychology
Sociology

partment 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 X-004, University of California, San Diego, La Jolla, CA 92093, or call (619) 534-4364.

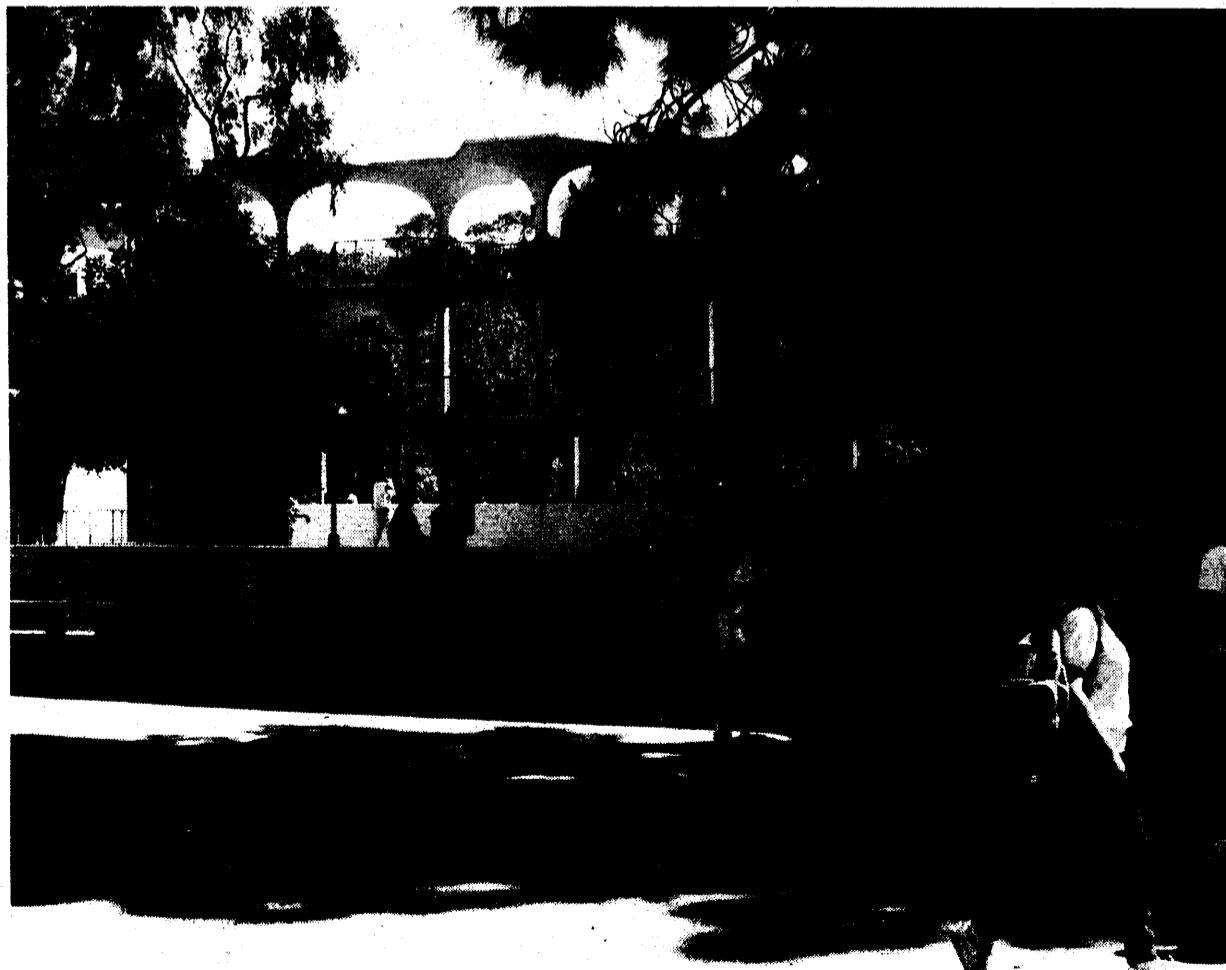
WHAT UCSD DOES NOT OFFER

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-

SPECIAL DEPARTMENTAL EMPHASES

The following are some special departmental emphases about which you may wish to be informed:

- UCSD has three departments that offer both undergraduate and graduate degrees in *engineering*. Majors include applied mechanics, applied physics, bioengineering, bioengineering: premedical, 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 De-



ferings on other UC campuses or at other institutions.

Among undergraduate majors presently not available at UCSD are:

1. Business.
2. Oceanography. Although UCSD does not offer an undergraduate major in oceanography, 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.
3. Nursing.
4. Industrial Arts.
5. Journalism. Although no major in journalism is offered, the Department of Literature offers a major in writing which can emphasize journalistic writing, and the development of writing skills is stressed in many disciplines. Many courses are offered in the humanities and social sciences which 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. However, a minor in physical education is offered. 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.

Presently there are five colleges: Revelle, John Muir, Third, Earl Warren, and Fifth College. 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 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 in 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 200-seat UCSD Theatre and the 500-seat Mandell Weiss Center for the Per-

forming Arts. 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, the Ice Cream Hustler, Third College Mountain View Lounge, and the Price Center.

MOUNTAINS, DESERTS, AND BEACHES

Many Southern Californians live outdoors the 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 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.

"MOST SPORTS-MINDED CAMPUS IN AMERICA"

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 twenty-two intercollegiate athletic teams along with seven club sports teams while the intramural program provides for student competition in twenty sports in three levels 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.

A new \$1.8 million outdoor athletic facility includes a fifty-meter competition-sized swimming pool, a whirlpool bath, four racquetball/handball courts among other facilities. This facility supplements the existing twenty-five-

INTRODUCTION

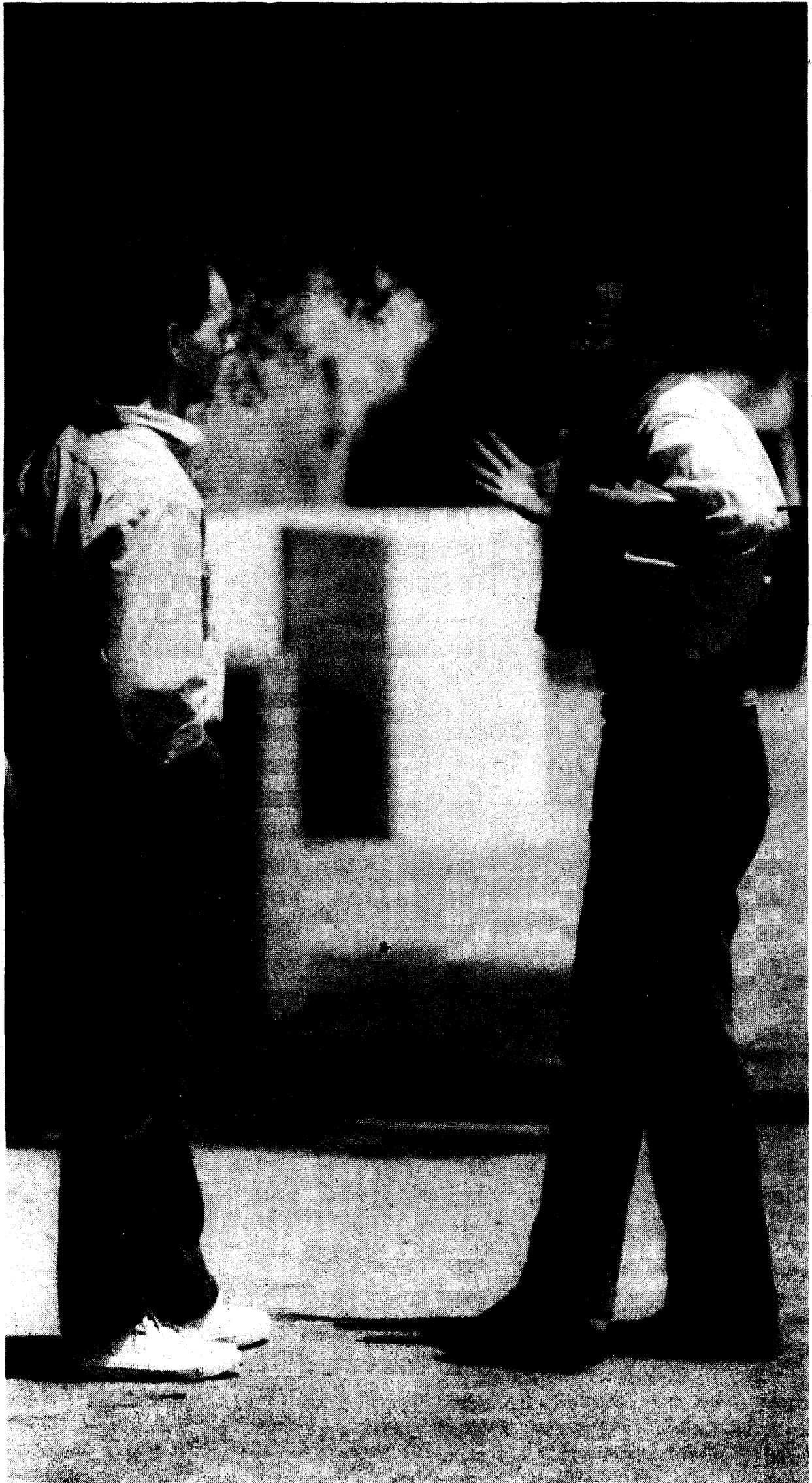
yard indoor natatorium, gymnasiums, tennis and handball courts, and various athletic fields elsewhere on the campus.

NEED MORE INFORMATION? CHECK THE FOLLOWING:

- How do I apply for admission? See page 37. (See also "Note," below.)
- How much does a UCSD education cost? See "Fees and Expenses," page 48.
- What's the grading system at UCSD? See page 63.
- 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.

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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—Muir, Third, 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 to encourage the students of the college to take an active role in their own intellectual development. The Muir requirements, combining as they do, a variety of year-long courses in four major academic areas and two expository writing courses, accommodate a wide range of interests and aptitudes and prepare for the broadest array of majors. The openness and flexibility of its curriculum makes Muir College particularly attractive to exceptionally able and well-prepared students as well as to students with well-defined academic interests. Students who qualify

are encouraged to substitute advanced-level courses for introductory courses to complete the college requirements.

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, combining independence and responsibility, has helped to make Muir the largest of UCSD's colleges.

THIRD COLLEGE EDUCATIONAL PHILOSOPHY

Third College was founded in 1970 and celebrates its twentieth anniversary in academic year 1990–91. It is a liberal arts and sciences college where students pursue majors in the humanities, fine arts, natural sciences, mathematics, engineering, and social sciences. 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 distinctive general-education requirements of Third College are drawn from these programs and departments, and are guided by the belief that, regardless of a student's major, a liberal arts education must include an examination of the human condition in a multicultural society. The societal analysis requirement provides that exposure, and fosters an awareness and understanding of the diversity of cultures and the variety of ways culture enables people to fashion lives of dignity.

In addition to the long-standing academic emphasis of the curriculum as an interdisciplinary approach to societal analysis, the college sponsors an extensive student leadership program. The leadership program seeks to encourage student participation in the governance of the college and in 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 post baccalaureate 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.

To ensure an in-depth exposure to the humanities/fine arts, the social sciences and the natural sciences, Warren students are required to take a number of courses in each of these areas. These courses are to be chosen carefully, with assistance from the college staff and faculty, to prepare the student for his or her postbaccalaureate career.

**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," will encourage students to think historically, across cultures, and across disciplines about both Western and non-Western cultures. In addition, students will 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 will also complete 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 will complete two courses in math or computer science and two courses in natural sciences. All students in Fifth College will be strongly encouraged, though not required, to spend time studying, working, or serving an internship in a foreign country.

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 more 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 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, based on 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 to the number of units. Most UCSD courses carry four quarter-units of credit, and a student usually takes four courses each quarter. Subjects are broadly classified as humanities and fine arts, social sciences, and natural sciences. Where a subject is listed here as "noncontiguous," this means that it must be in one of those categories which is different from that of the major. Students must meet the Subject A requirement prior to enrolling in the writing course of their respective college.

General Education

REVELLE COLLEGE

HUMANITIES
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 5

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

BIOLOGY 1

FOREIGN LANGUAGE
number of courses to attain proficiency 0-4

CALCULUS 3

SOCIAL SCIENCES 3
Anthropology, economics, political science, psychology, sociology

FINE ARTS 1
Art, music, theatre

MUIR COLLEGE

WRITING 2-3

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

HUMANITIES
FINE ARTS
FOREIGN LANGUAGE

AND

A THREE-COURSE SEQUENCE 6
In **SOCIAL SCIENCE** and another three-course sequence in either **MATHEMATICAL SCIENCE** or **NATURAL SCIENCE**

THIRD COLLEGE

WRITING 2

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

OPERATIVE LOGIC 2
One course in computing, and one course in math or statistics

SOCIETAL ANALYSIS 3
One course each from three of four areas listed: communication, third world studies-history/social science or literature; or urban studies & planning. Two associated writing adjuncts are required for freshmen and one for transfer students.

A THREE-COURSE SEQUENCE 3
In humanities, foreign language, or fine arts.

NONCONTIGUOUS UPPER-DIVISION 3
At least one of the upper-division non-contiguous courses must focus on a culture or society other than one's own.

WARREN COLLEGE

WRITING 2

ETHICS and SOCIETY 1

FORMAL SKILLS 2

Two courses in calculus
OR
Two in symbolic logic
OR
Two in computer science
OR
One in computer science and one in symbolic logic

PROGRAMS OF CONCENTRATION
(for B.A./B.S. degrees in arts/sciences) 12
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
(for B.S. degrees in engineering) 6
Two area studies each consisting of three courses. One area of study in humanities/fine arts and one in social sciences.

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 in arts/science: 46 courses (184 units).

B.S. degrees in engineering: 48 courses (192 units) minimum.

B.A./B.S. degrees in arts/science: 45 courses (180 units). At least 18 courses must be upper-division.

B.S. degrees in engineering: At least 72 units of the 192 units total must be upper-division.

B.A. degrees in arts/science: 45 courses (180 units). At least 18 courses (72 units) must be upper-division.

B.S. degrees in engineering: 48 courses (192 units). At least 18 courses (72 units) must be upper-division.

B.A./B.S. degrees in arts/science: 45 courses (180 units). At least 60 units (15 courses) must be upper-division.

B.S. degrees in engineering: At least 72 units of the 192 units total must be at the upper-division level.

B.A./B.S. degrees in arts/science: 45 courses (180 units). At least 60 units (15 courses) must be upper-division.

B.S. degrees in engineering: At least 72 units of the 192 units total must be at the upper-division level.



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. 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. 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, at least two of which must be in one social science department (to be selected from an approved list).
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 Institu-

tions. (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 in the social sciences are required. Students will choose three lower-division courses from an approved list of offerings from the Departments of Anthropology, Economics, Linguistics, Political Science, Psychology and Sociology, or from an interdisciplinary social science sequence.

At least two of the courses must be in one social science department or sequence.

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 courses: Physics 1A-B-C, Physics 2A-B-C-D, and Physics 4A-B-C-D-E. The Department of Biology offers Biology 1, 3, or 11 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	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.

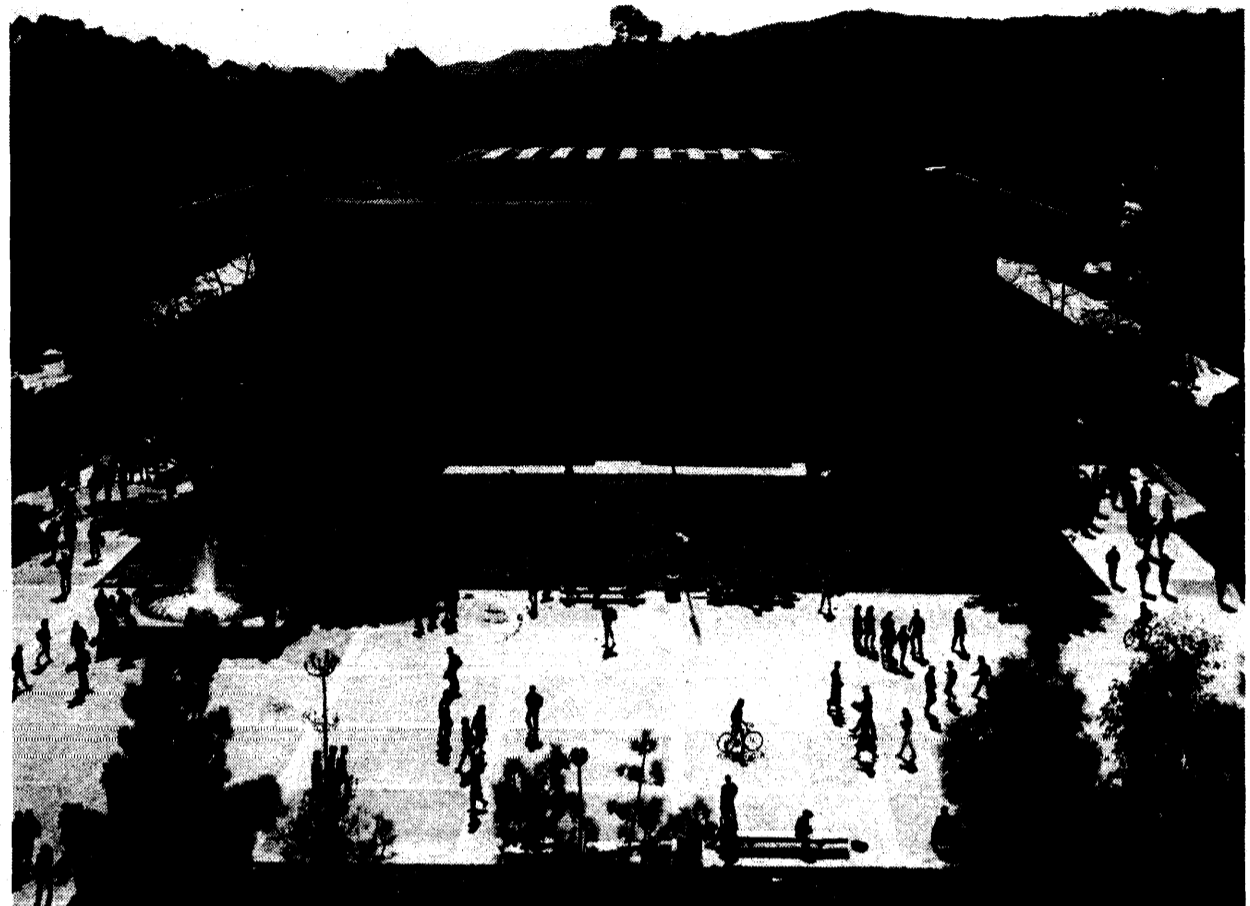
THE MAJOR

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, communication, economics, QEDS, 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

REVELLE COLLEGE

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 in arts/sciences or 192 quarter-units for the B.S. degree in engineering. The requirements of most B.S. engineering majors and the college exceed 192 units. In such cases, a student may need to average more than the normal sixteen units per quarter in order to graduate in four years. 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.")

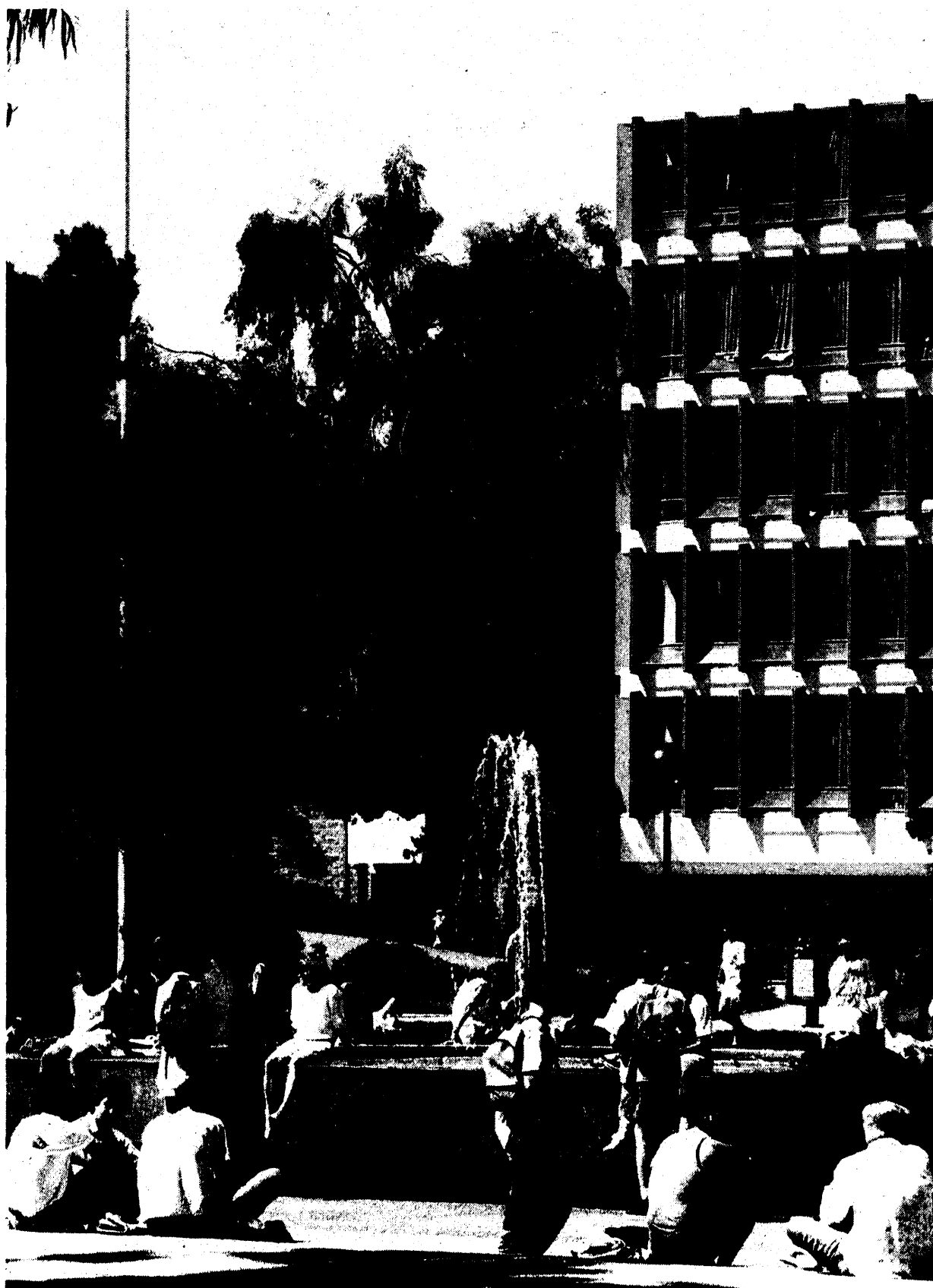
Upon satisfaction of the graduation requirements, Revelle College will recommend that the student be awarded the bachelor of arts degree or the bachelor of science degree in physics, cognitive science, chemistry, or in designated engineering programs.

HONORS

Particularly well-prepared students are invited to join a freshman honors program, which 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 mankind. 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 on such topics as "The Wilderness and Human Values" and "Living and Learning in a Modern University." 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. 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 for-

eign languages. Students choose sequences from several alternatives. It should be understood that this freedom carries with it certain responsibilities on the part of the student for careful planning. Some of these are:

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

For students who transfer to Muir College from another institution, the general-education

requirements will be interpreted in this way: two semester-courses or three quarter-courses in one subject represented on the approved list normally will be accepted as completing one of the four required sequences. After the Office of Admissions evaluates a student's transcript, the 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 G.P.A.). 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.*



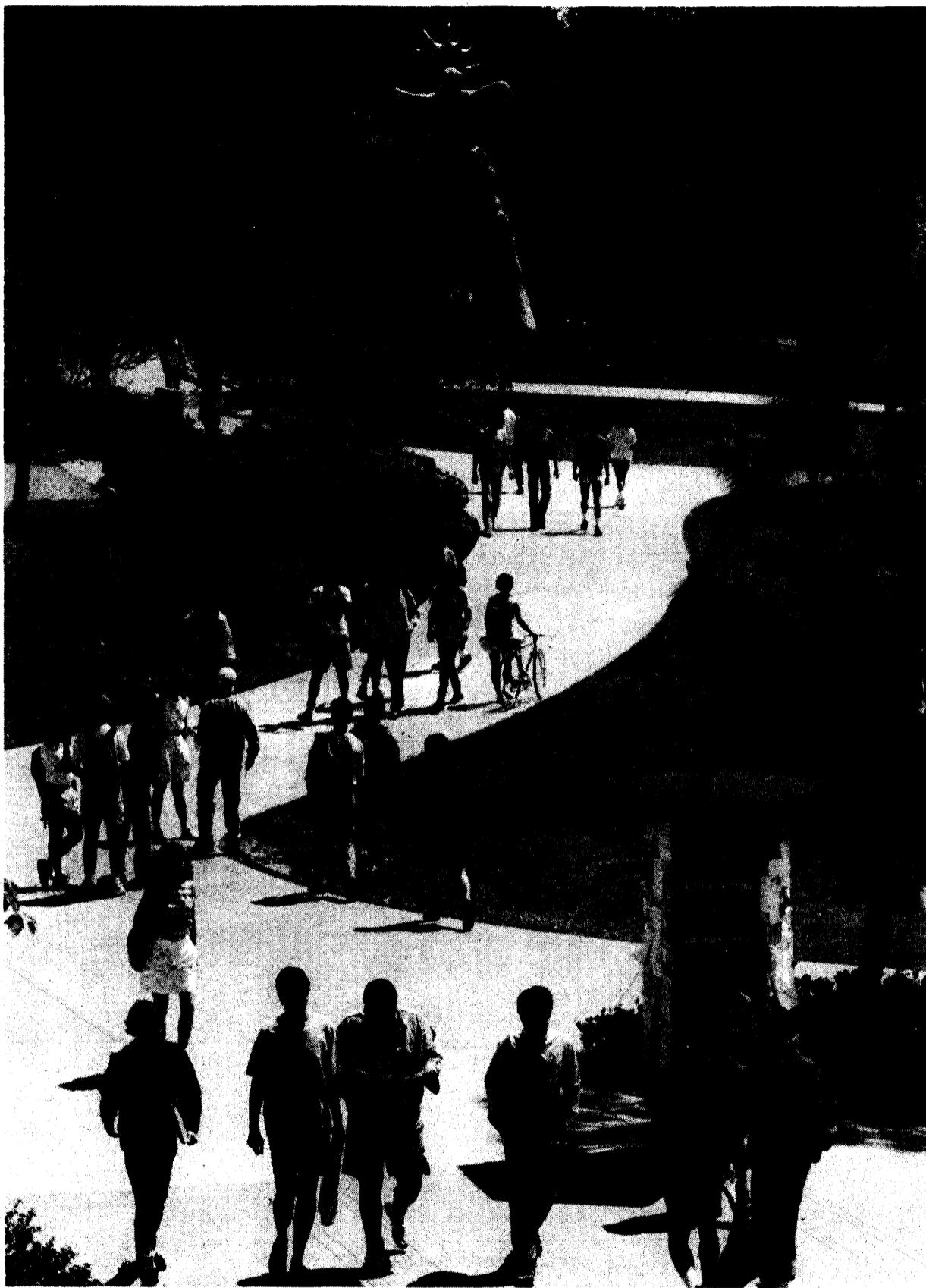
MAJOR PROGRAMS AND SPECIAL PROJECTS

Almost all of the major programs at UCSD have a pattern of prerequisites, some of them quite extensive. Students 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 members of the faculty concerning the selection of appropriate courses.

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 often 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 project major normally includes both regular course work, independent study, and a project or senior thesis as well as a recommended back-up major. Taken together, the project major must represent a minimum of fifteen four-unit upper-division courses. The project may be one of two kinds: creative work of some sort (e.g., a book of poetry, a collection of musical compositions), or a detailed program of study and research in a particular area. The latter results in a long paper representing a synthesis of knowledge and skill acquired. In either case, a



regular member of the faculty must serve as an adviser to a student doing the project. It should be understood that the demands of a special project major are great, and a project is not appropriate for a student who simply does not want the discipline of a normal major. For a course to be included as part of a Muir Special Project, the student must earn in it a grade of C— or better. Further information may be obtained from the advising unit of the Office of the Provost.

GRADUATION REQUIREMENTS

To receive a degree of bachelor of arts or bachelor of science (the latter offered in some engineering majors and physics), a John Muir College student must:

1. Declare graduation by receiving, 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.** Stu-

dents 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.**

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. 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 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. Departments may require a C average in all upper-division courses and/or a grade of C- or better in courses required for the major.
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, Communication, Economics, Visual Arts-media, and Mathematics-computer science require students to attain a minimum G.P.A. 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 must 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. A grade-point average of at least 2.0 in the major and overall is required. 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. *Students may not graduate with "NRs," "IPs," or "Incomplete" entries on their transcript.* Therefore, they should be sure that all incompletes have been made up and final grades have been properly recorded by the end of the quarter in which they plan to graduate.
11. All requirements for the degree are to be completed 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. *If students are unable to satisfy all graduation requirements, including grade changes, by the end of the quarter, they must refile the Degree and Diploma Application form to graduate in the quarter in which the deficiencies will be 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, and only one upper-division class may be taken P/NP. (A 199 course can only 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 (180 units, of which 72 must be upper-division) or bachelor of science (offered only in some engineering majors, requiring 192 units of which at least 72 units must be upper-division or cognitive science and physics which require 180 units of which at least 72 units must be upper-division).

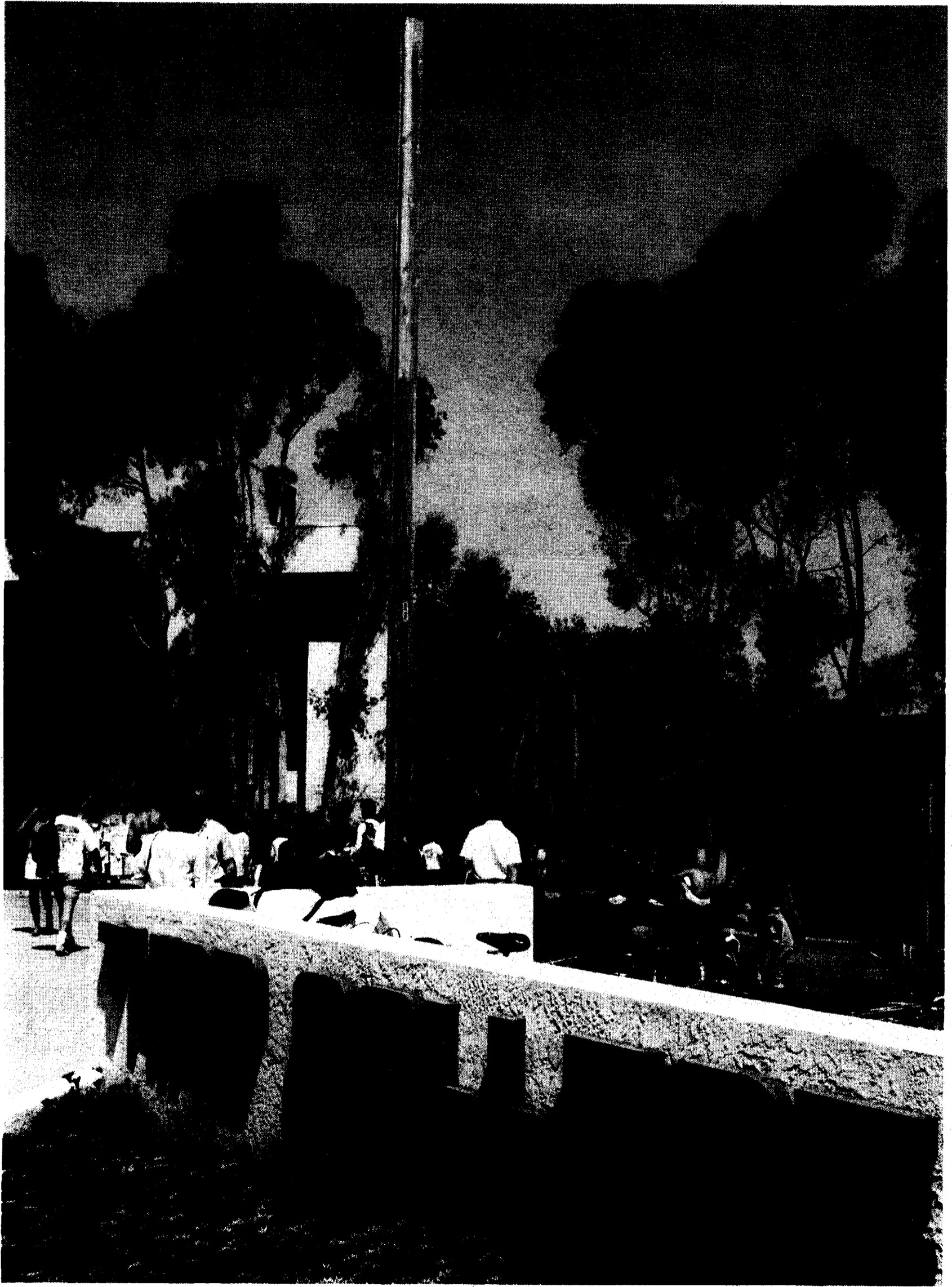
HONORS

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 Alfvén, 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

*Deceased



Third College was founded in 1970 and celebrates its twentieth anniversary in academic year 1990-91. It is a liberal arts and sciences college where students pursue majors in the humanities, fine arts, natural sciences, mathematics, engineering, and social sciences. 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 distinctive general-education requirements of Third College are drawn from these programs and departments, and are guided by the belief that, regardless of a student's major, a liberal arts education must include an examination of the human condition in a multicultural society.

In addition to the long-standing academic emphasis of the curriculum as an interdisciplinary approach to societal analysis, the college sponsors an extensive student leadership program. The leadership program seeks to encourage student participation in the governance of the college and in 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 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.

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. A related aim is to foster awareness and understanding of the diversity of cultures and the variety of ways culture enables people to fashion lives of dignity. Third College will be attractive to students who seek to develop an informed sensitivity to the many cultural perspectives that have contributed to the shaping of present-day America—and thereby to the personal formation of each of us.

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 and self-confidence and strong interpersonal, organizational, and leadership skills.

The Third College educational philosophy is also 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 our collegiate advising and counseling systems, which enable students to derive full benefit from the rich and diversified academic programs at UCSD.

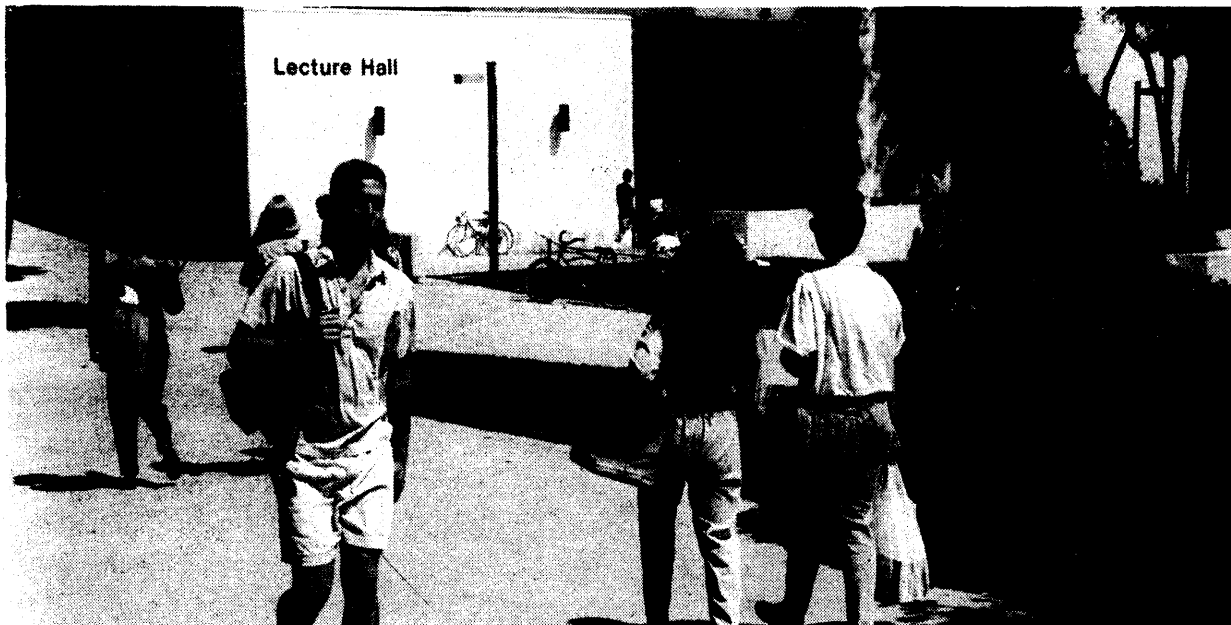
It is fundamental to the philosophy of Third College that students, faculty, and staff constitute an intellectual community joined in the task of mutual learning. This aspect of the Third College philosophy is reflected in the participation of students in faculty research projects, in the acquisition of a major grant to support minority students in biomedical research by the science faculty, and in the close working relationship of faculty, students, and administration in collegiate governance.

GENERAL-EDUCATION REQUIREMENTS

General-education requirements are established by the 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 are as follows:

1. **WRITING:** A two-course sequence in writing.
2. **SOCIETAL ANALYSIS:** Three courses chosen from three of the following four areas: communication, third world studies—history and social science, third world studies—literature, and urban studies and planning. Entering freshmen must take two of the three societal analysis courses as integrated six-unit writing adjuncts. However, students graduating with a B.S. in engineering need select only two courses from two different areas. Both of these courses must be taken as six-unit writing adjuncts. Transfer students must complete at least one of their societal analysis courses as a writing adjunct.
3. **NATURAL SCIENCE:** Three courses. One course each in the following areas: biology, chemistry, and physics.



4. **OPERATIVE LOGIC:** Two courses required. One introduction to computing course, and one course in either mathematics (pre-calculus or higher) or statistics.
5. **HUMANITIES, FINE ARTS, OR FOREIGN LANGUAGES:** A *one-year sequence* (excluding studio or performance courses in fine arts).
6. **NONCONTIGUOUS UPPER-DIVISION REQUIREMENT:** Three noncontiguous upper-division courses. At least one course must focus on a culture or society other than one's own.
7. All students are required to complete a minimum of eighteen (four unit) upper-division courses.

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 (nine of the last eleven courses must be completed as a registered Third College student).
6. Complete a minimum of forty-five courses (180 quarter units), for the B.A./B.S. degree in arts and science and forty-eight courses (192 quarter units) for the B.S. degree in engineering. All students must complete a minimum of eighteen four-unit upper-division courses.
7. A "C" average or higher is required.

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. All upper-division courses must be taken on a letter grade 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. Upper-division courses to be counted toward a minor must be taken on a letter-grade basis.
3. Courses taken toward completion of the Third College general-education requirements, with the exception of TCWP 1A and 1B, 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 consult with the Academic Honors Program adviser, in the academic advising office.

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.

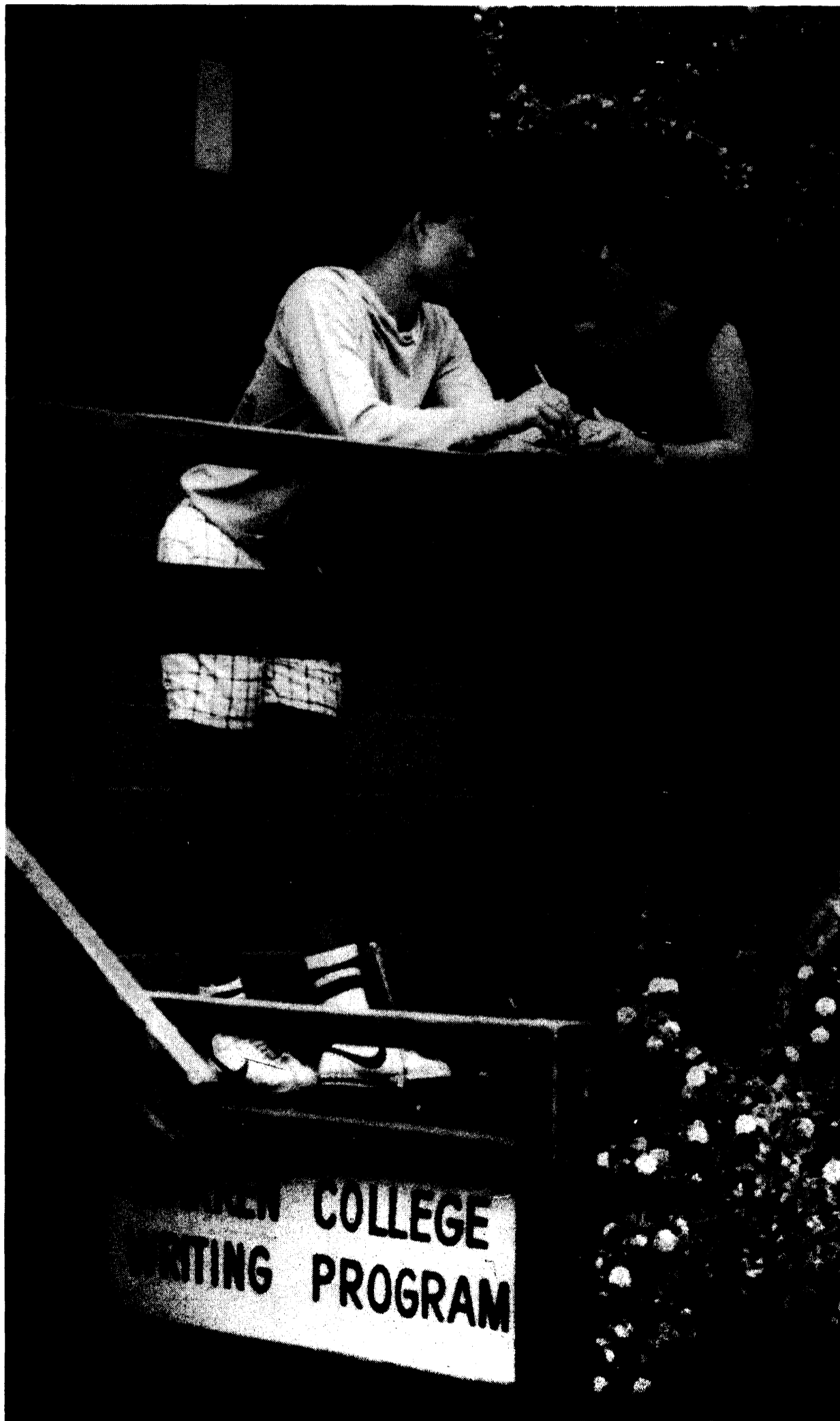
As governor during an era of lightning growth for California, he developed the State Department of Mental Hygiene, and led in reforms of the prison system in California by establishing the Board of Corrections and the Prisoner Rehabilitation Act. In his final role as a public servant, Mr. Warren was 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 Warren 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. Warren students must also complete a two-course sequence which requires formal or algorithmic reasoning. Subjects that can be taken to satisfy the formal skills requirements are: two courses in calculus, computer science, or symbolic logic. All options must consist of two courses in one area except computer science and symbolic logic, where a combination is acceptable.

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 toward graduation.

GRADUATION REQUIREMENTS

To receive a **B.A. or B.S. degree in arts and sciences** 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. 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.

4. Attain a C average (2.0) or better in all work attempted at the University of California.
5. 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.
6. Pass 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.

To receive a **bachelor of science** degree in engineering from Warren College, a student must comply with requirements 1. through 5. above. Additionally, the total number of courses must be forty-eight (192 units) of which at least eighteen courses (72 units) must be at the upper-division level. As with the bachelor of arts degree, no more than 3 units of physical education (activity) may apply. Presently the bachelor of science engineering degree is offered in the following engineering programs: mechanical engineering, structural engineering, chemical engineering, engineering science, bioengineering, system and control engineering, computer science, computer engineering, electrical engineering and engineering physics. The total number of

units required for certain majors may exceed 192.

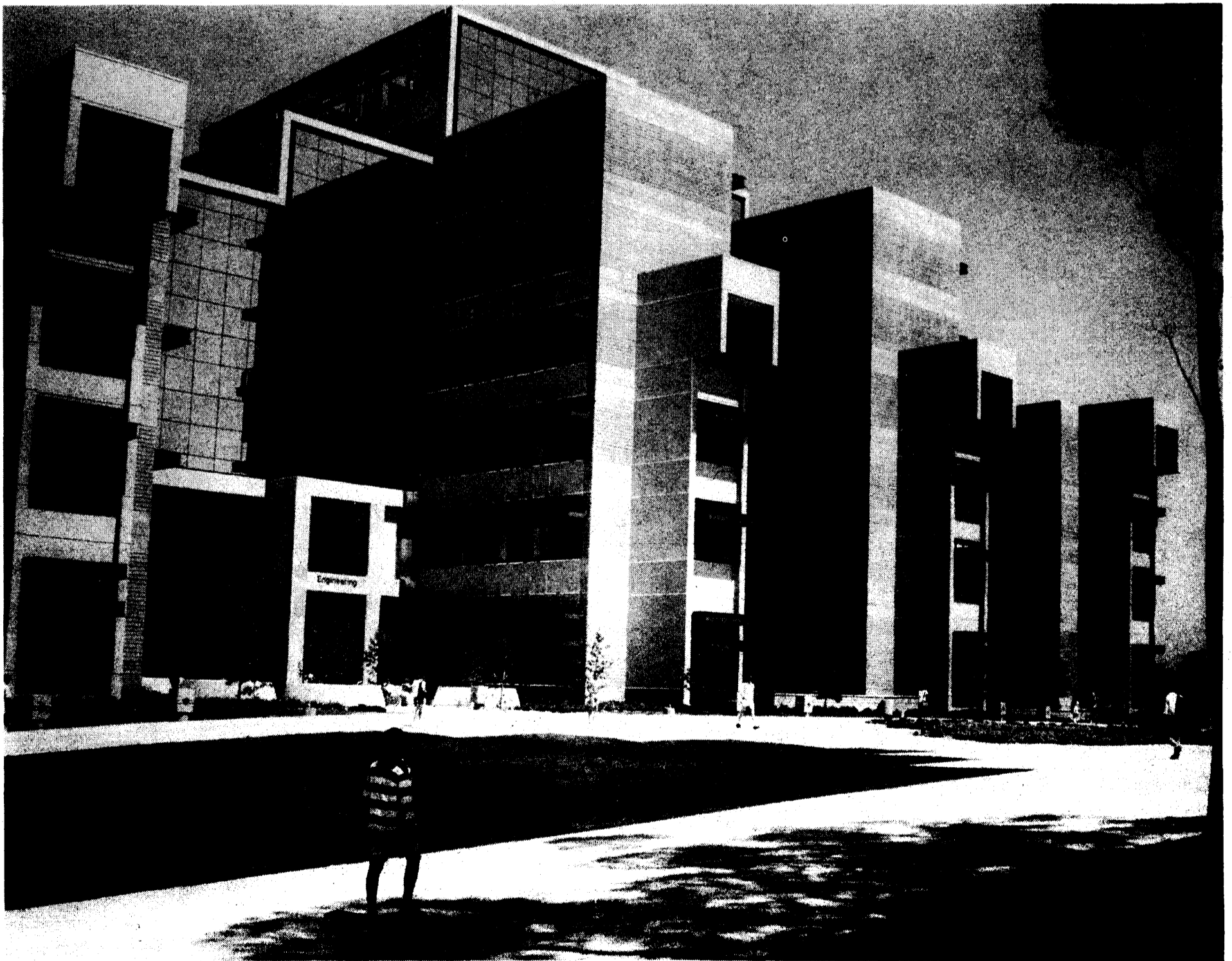
THE WARREN COLLEGE SCHOLARS PROGRAM

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



EARL WARREN COLLEGE

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

HONORS

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

HONORARY FELLOW OF THE COLLEGE

Harry N. Scheiber, Historian

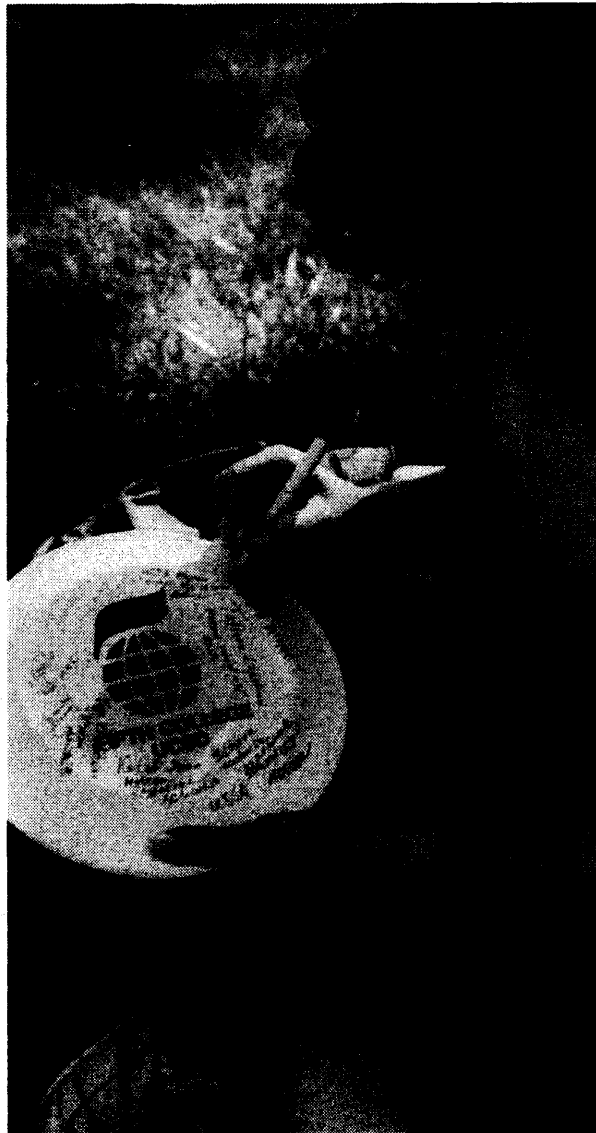


FIFTH COLLEGE

The newest member of UCSD's family of undergraduate colleges, Fifth College enrolled its first freshman class in the fall of 1988. In developing an academic plan for the new college, Fifth College faculty were guided by the conviction that a global perspective is essential to informed participation in our contemporary world. The resulting general-education curriculum, while including basic studies in a broad range of disciplines, offers students an especially strong background in international studies, comparative culture, and foreign language. Every Fifth College student will study at least one foreign language at the university level. In the freshman and sophomore years, students will examine a number of Western and non-Western cultures historically and comparatively. In the junior and senior years, in addition to concentrating on work in the major field, students will choose a single geographic area to study in depth. Although study abroad is not required, students will be strongly encouraged to study or to complete a career-related internship in another country during the undergraduate years.

The college's international focus is designed to complement and to enhance learning in any major that a student might choose. Students seeking careers in fields as diverse as business, public policy, engineering, and the arts will find Fifth College's international perspective equally valuable.

All aspects of student life at Fifth College will reflect the college's international emphasis. Residence life programs will range from international meals to informal sessions on global issues. Undergraduates will live in the residence halls, and many resident advisers will be upper-division students who have studied overseas. Students living both on and off campus will have opportunities to participate in such activities as folk dancing, foreign films, and celebration of "national days" of other countries. The International House located nearby also will sponsor a variety of activities that will be of great interest to students who seek to broaden their perspective on the world.



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 grid 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 to be taken in the freshman and sophomore years. The sequence will examine 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, to be 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 Provost's Office for a list of re-

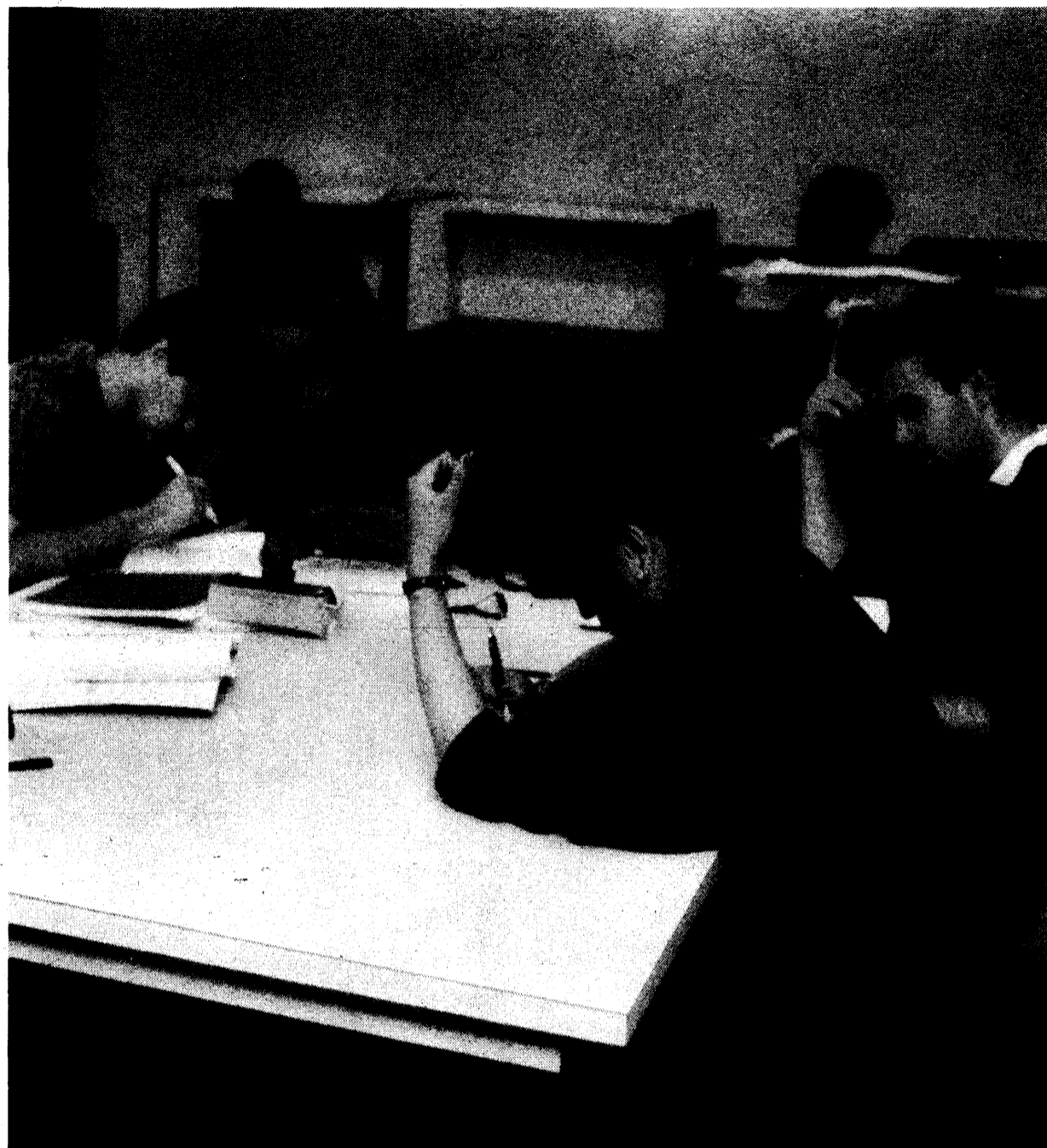
gional specialization areas and courses. (See *Minors* below regarding application of regional specialization course work to completion of an optional minor.)

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.

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		

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.



For details on major requirements and prerequisites, please see listings in this catalog under the various academic departments and programs.

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 college residency requirement that nine of the last eleven courses (thirty-six of the last forty-four units) passed must be completed as a registered Fifth College student.

6. Complete and pass a minimum of 180 units for the B.A. or B.S. degree in arts and sciences or 192 units for the B.S. degree in engineering. For the B.A. degree, at least 60 of these units must be completed at the upper-division level; for the B.S. degree at least 72 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

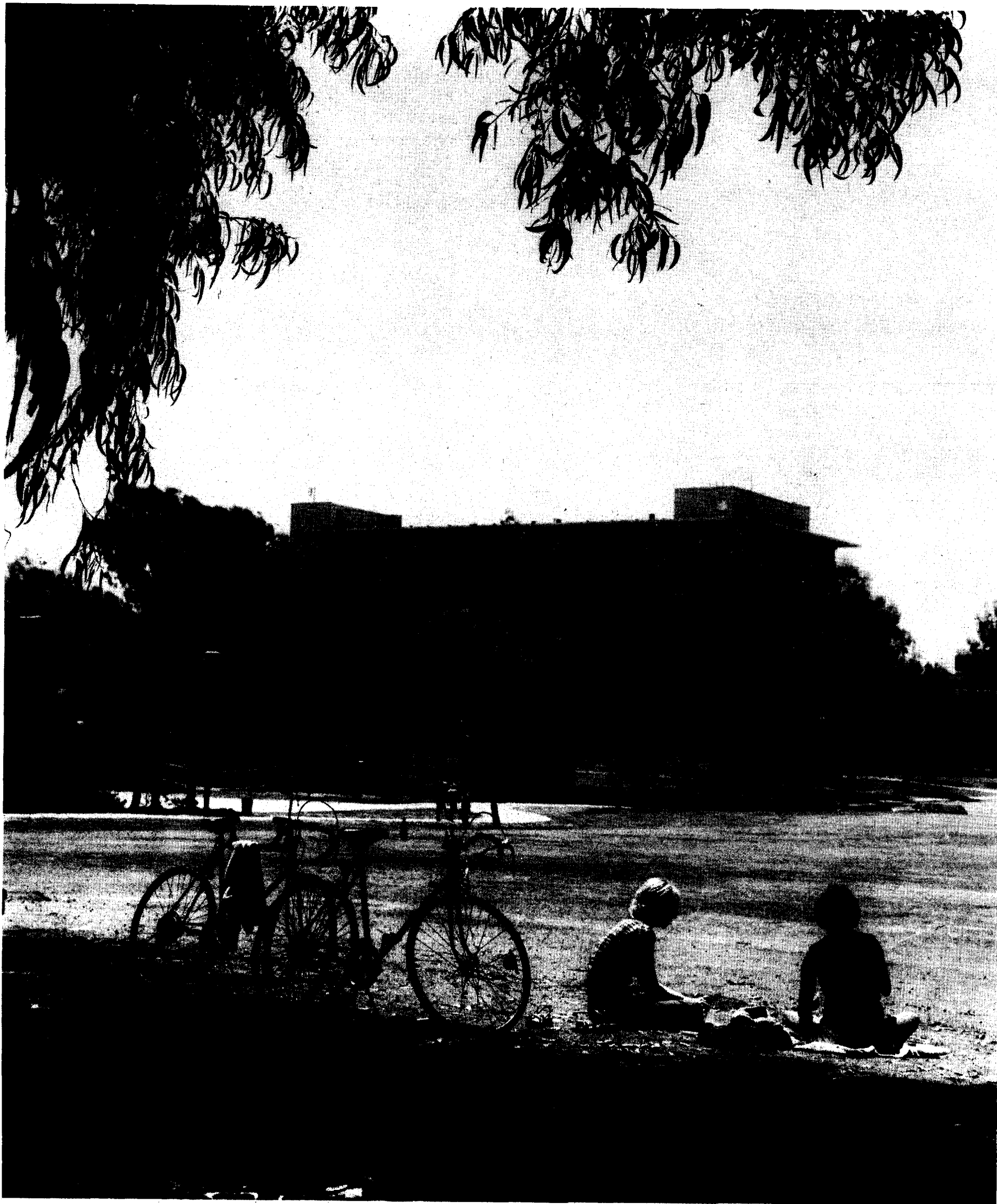
All Fifth College students are strongly encouraged to study or to complete a career-related internship in another country. Opportunities for study abroad have increased dramatically in recent years, with possible

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

Quarterly provost's honors, honors at graduation, departmental honors in the major, and Phi Beta Kappa membership are awarded. In addition, a freshman honors program is currently in place and a second-year program will be implemented in 1990-91. For further information, see "Honors" and "Phi Beta Kappa" in the index.





UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

All communications concerning undergraduate admission should be addressed to the Office of Admissions, Q-021A, University of California, San Diego, La Jolla, California 92093.

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 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 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 admis-

sion 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:

Student Outreach and Recruitment, B-037
UCSD, La Jolla, California 92093
(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 black, 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, admission, and application-related services include visits to high schools and community colleges, pre-admission counseling, application fee waivers, application follow-up, deferral of the Statement of Intention to Register fee (EOP only), special action admission consideration, and extended application deadlines (SAA 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) 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 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 black, 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 Admission Application 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. The essay should give your reasons for applying to EOP or SAA and should also elaborate on your career goals and personal interests.
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 attended. 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 awards. 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:

Student Outreach and Recruitment, B-037
University of California, San Diego
La Jolla, California 92093
(619) 534-4831.



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 explained 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, Electrical and Computer Engineering, Communication, and Economics 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 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 performance in classes and a consistent pattern of courses. Overall performance must be well above minimum requirements in order to admit you to the campus and major of your choice.

UCSD ADMISSION POLICY AND SELECTION CRITERIA

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

ademic 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 fifty-six transferable semester-units (eighty-four quarter-units) and will be on a priority basis. In priority order, the following will be admitted: transfers from California community colleges; transfers from other University of California campuses (ICT's); upper-division transfers from other California four-year institutions; and lastly, upper-division transfers from non-California institutions.

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 sixteen 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.)

Fifteen of these required 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, English, advanced mathematics, laboratory science,* foreign language, social science, and

* 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.

UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

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.

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 stud-

ied. 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 taken in the student's last two years of high school 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. These courses must be in the areas of history, English, advanced mathematics, laboratory science, and foreign language.

Table of Grade-Point Averages and Corresponding Required Test Scores

A-F GPA	ACT* COMPOSITE	SAT** TOTAL	A-F GPA	ACT* COMPOSITE	SAT** TOTAL
2.78	36	1600	3.04	24	990
2.79	36	1580	3.05	23	970
2.80	35	1550	3.06	22	950
2.81	35	1530	3.07	22	920
2.82	34	1510	3.08	21	900
2.83	34	1480	3.09	21	880
2.84	34	1460	3.10	20	850
2.85	33	1440	3.11	20	830
2.86	33	1410	3.12	19	810
2.87	33	1390	3.13	19	780
2.88	32	1370	3.14	18	760
2.89	32	1340	3.15	17	740
2.90	31	1320	3.16	17	710
2.91	31	1300	3.17	17	690
2.92	30	1270	3.18	16	670
2.93	30	1250	3.19	15	640
2.94	29	1230	3.20	14	620
2.95	29	1200	3.21	14	600
2.96	28	1180	3.22	14	570
2.97	28	1160	3.23	13	550
2.98	27	1130	3.24	13	530
2.99	27	1110	3.25	12	500
3.00	26	1090	3.26	12	480
3.01	26	1060	3.27	11	460
3.02	25	1040	3.28	11	430
3.03	25	1020	3.29	11	410
			3.30	11	400

*ACT is scored in intervals of 1 point from a minimum of 1 to 35 maximum.

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

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.
 - 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 \$35 fee attached.

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 select California applicants. If you make a perfect score on the SAT (1600) or the ACT (35) you need a GPA of only 2.78 to be

*The Achievement Test in literature may not be substituted.

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.

Eligibility by Examination Alone: If you do not meet the scholarship and subject requirements for admission, you can qualify for admission as a freshman by examination alone. To do so, you must earn 1100 on the SAT or 26 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.

FRESHMAN ELIGIBILITY

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 1100 on

the SAT or 26 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 ten "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.

The Computer Science test was revised recently and there are now two tests: Computer Science A and Computer Science AB. The revised tests are under review by the university. Until the review is completed, four quarter-units of credit will continue to be awarded for the test. The university is also reviewing the new AP test in Economics.

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
(4 unit maximum for both tests)	
Economics	
Microeconomics	4
Macroeconomics	4
English	
Composition and Literature	8
Language and Composition	8
(8 unit maximum for both tests)	
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
(8 unit maximum for both tests)	
Music	
Listening and Literature	8
Theory	8
(8 unit maximum for both tests)	
Physics	
Physics B	8
Physics C1 (Mechanics)	4
Physics C2 (Electricity and Magnetism)	4
(8 unit maximum for three tests)	

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.

ADVANCED PLACEMENT EXAMINATIONS

The Advanced Placement Examinations of the College Entrance Examination Board are taken, usually during the senior year, in conjunction with courses taken in high school. You will receive eight quarter-units of university credit for most examinations in which you earn a score 5, 4, or 3. These credits will apply toward the total required for graduation from the university. See the Advanced Placement chart which appears later in this section.

ADMISSION AS A TRANSFER APPLICANT

The university defines a transfer applicant as a high school graduate who has been a registered student in another 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 REQUIREMENTS EFFECTIVE FALL 1989

Transfer students applying for admission for fall 1989 and thereafter will have to satisfy the freshman admission requirement in mathematics that became effective fall 1986: that is *three* years of mathematics.

SCHOLARSHIP REQUIREMENT

The requirements for admission as a transfer student vary according to your high school record.

DETERMINING YOUR GRADE-POINT AVERAGE

Your grade-point average 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 up to a maximum of sixteen quarter-units without penalty. 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 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. *UCSD will give admission preference to community college transfers in this category.*

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 the foreign credential 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.

NEW UNIVERSITY OF CALIFORNIA TRANSFER AGREEMENTS

The University of California established two new transfer admission policies in 1988. These two new policies, UC Transfer Reciprocity and Transfer Core Agreements (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 new policies or may elect to fulfill the B/GE requirements at UCSD. Students electing to satisfy the requirements by either of the new 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.

TRANSFER CORE CURRICULUM AGREEMENTS

Transfers from other California institutions can fulfill the UC lower-division breadth and general education requirements by completing

the transfer core curriculum. The transfer core curriculum consists of the following subjects:

TRANSFER ELIGIBILITY

CALIFORNIA RESIDENT (MINIMUM REQUIREMENTS)

As a transfer applicant you must meet one of the requirements described below 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 may be admitted 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 admitted 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 admitted to the university after you have:

a. Established a college grade-point average of 2.4 or better in transferable courses; *and*

b. Completed eighty-four quarter- or fifty-six semester-units of transferable college credit; *and*

c. Completed *one* of the following:

I. Appropriate college courses, with grades of C or better, in the "a-f" subjects you lacked. Up to two units of high school work in "a-f" subjects will be waived, but transfer applicants must have satisfied the freshman admission requirements in English and mathematics. A unit is equivalent to a one-year course; *or*

II. One college course in mathematics, one in English, and one in either U.S. history, a laboratory science, or a foreign language, all with grades of C or better. The course in mathematics must assume a proficiency level equivalent to three years of high school mathematics (i.e., elementary algebra, advanced algebra, and geometry). The course may be trigonometry or a more advanced course in mathematics 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 *eighty-four 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 non-resident, 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.

Subject Area	Minimum Requirement	Minimum Requirement
1. Foreign Language	Proficiency	Proficiency
2. English Composition	2 semesters or 3 quarters	6 semester-units
3. Mathematics/Quantitative Reasoning	1 semester or 2 quarters	3 semester-units
4. Arts and Humanities	3 semesters or 4 quarters	9 semester-units
5. Social and Behavioral Sciences	3 semesters or 4 quarters	9 semester-units
6. Physical and/or Biological Sciences	2 semesters or 3 quarters	7 semester-units
TOTALS	11 semesters or 16 quarters	34 semester-units

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

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

If you are a non-resident 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.

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 which will be acceptable is 550.

The results of this test will be used to determine whether the applicant's command of English is sufficient to enable him or her to pursue studies effectively at UCSD. Foreign

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

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

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

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 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 an approved program with the college. Limited status students are not awarded on-campus housing.

Limited status students are eligible to apply for a Guaranteed Student Loan if they have not exceeded the duration limit of eighteen quarters of postsecondary attendance. Academic transcripts will be required from all institutions attended *prior* to student financial services certifying of the application.

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 1991:

File November 1-30, 1990

Winter Quarter 1992:

File July 1-31, 1991

Spring Quarter 1992:

File October 1-31, 1991

UC Berkeley Only

Fall Semester 1991:

File November 1-30, 1990

Spring Semester 1992:

File July 1-31, 1991

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 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 15.

NOTIFICATION OF ADMISSION

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. If you are applying to transfer, the campuses may notify you any time between March 1 and June 1. **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. In the case of transfer applicants, determination of eligibility cannot be made with more than one term still to be completed.

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

ESTIMATED EXPENSES FOR ON-CAMPUS UNDERGRADUATE RESIDENTS OF CALIFORNIA

Non-California residents should estimate approximately \$1,972 additional tuition fees each quarter.

	FALL QUARTER	WINTER QUARTER	SPRING QUARTER	TOTAL
University Registration Fee*	\$214	\$214	\$214	\$642
Educational Fee	301	301	301	903
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.)	1,843	1,843	1,844	5,530
Transportation (Approx.)	174	174	174	522
Books, Supplies (Approx.)	168	168	168	504
Personal Expenses (Approx.)	503	503	504	1,510
Total	\$3,266	\$3,266	\$3,268	\$9,800

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

*Estimated

UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

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

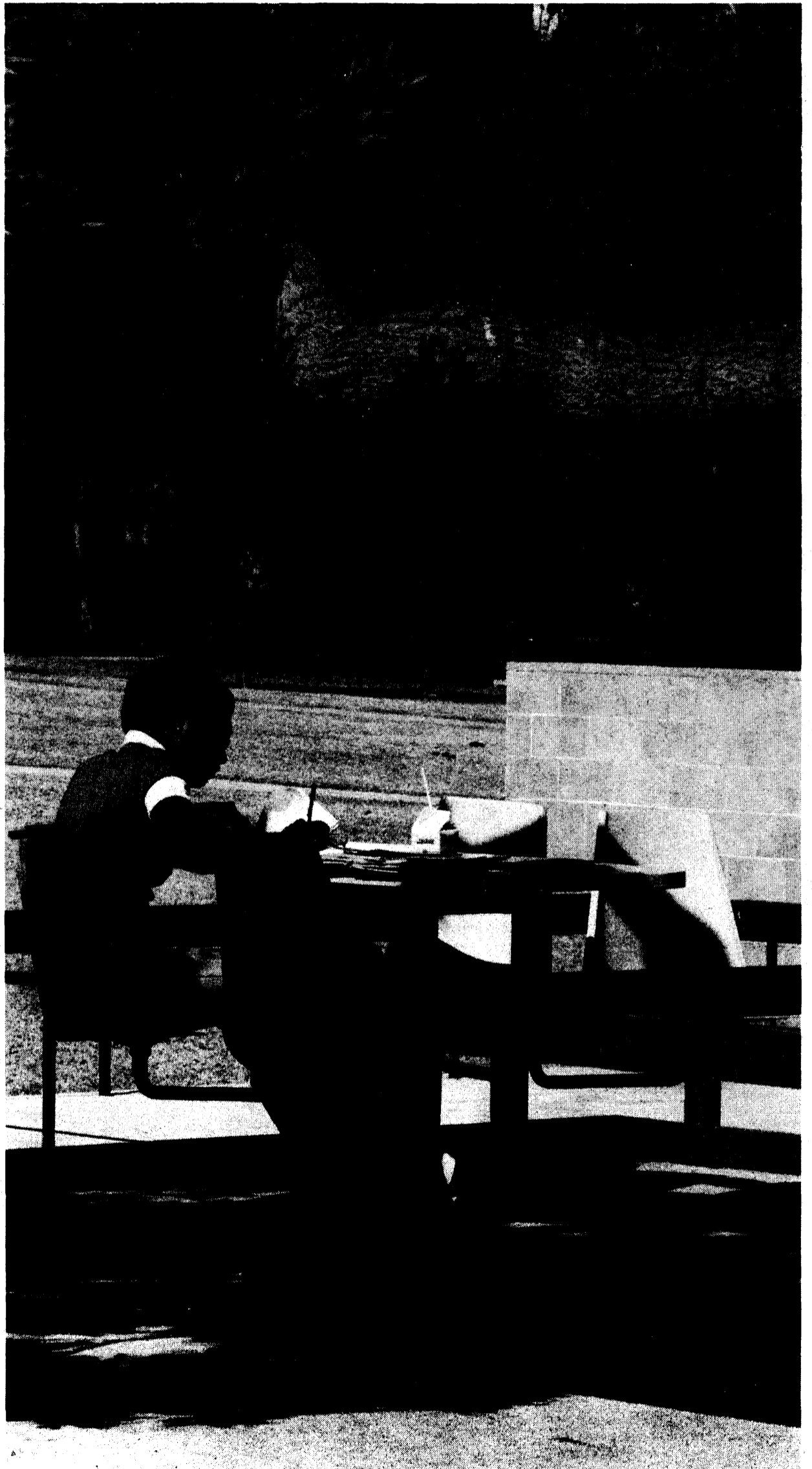
An application for admission is effective only for the quarter for which it is submitted. If you are ineligible for admission, or if you are admitted and do not register, you must file a new application to be considered for a later quarter. The selection criteria in effect for the new term must be met. If you have been admitted to the university and paid registration fees, but did not attend, contact the Office of the Registrar for readmission information. Review of the new application will be based on requirements in effect at time of readmission or reapplication.

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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 \$9,800 for California residents living away from home.

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

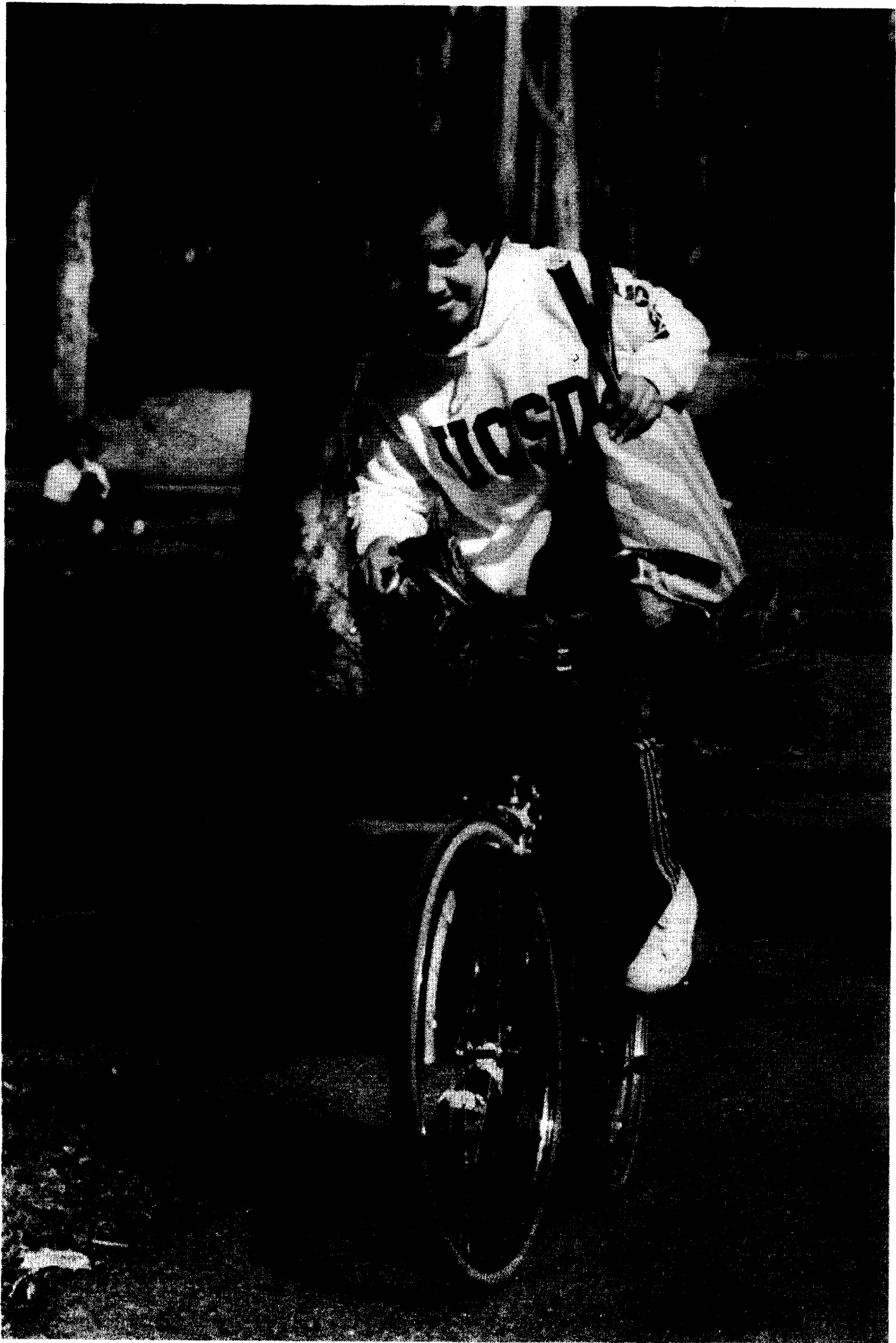


UNDERGRADUATE ADMISSIONS, POLICIES AND PROCEDURES

COLLEGE BOARD ADVANCED PLACEMENT TESTS AT THE UNIVERSITY OF CALIFORNIA

	MUIR COLLEGE	THIRD COLLEGE	REVELLE COLLEGE	WARREN COLLEGE	FIFTH COLLEGE
ART—HISTORY	8 units of elective credit or 2 quarters of art history sequence.	2 courses toward fine arts sequence.	Fulfills fine arts requirement or 2 courses of the non-contiguous minor or as 8 units of elective credit	May apply toward program of concentration requirements. See Warren adviser for details.	1 course toward fine arts requirement.
ART—STUDIO •Drawing Portfolio •General Portfolio	8 units of elective credit. (Maximum of 8 units for both tests.)	8 units of elective credit.	Fulfills fine arts requirement and 1 course of non-contiguous minor or 8 units of elective credit.	8 units of elective credit.	8 units of elective credit.
BIOLOGY	Score 3 = 8 units credit & exempt Biology 10. Score 4 or 5 = 8 units credit & exempt Biology 1, 2, & 3.	Same as Muir	Score 3 = 8 units credit; meets Revelle GE biology requirement. Score 4 or 5 = 8 units credit and exempt Biology 1, 2, and 3.	Same as Muir	Same as Muir. Score of 4, 5 completes natural science requirement.
CHEMISTRY	Score 3 = 8 units credit & exempt Chem. 4 or 11. Score 4 = 8 units credit & exempt Chem. 11, 12 or Chem. 6A and may take Chem. 7A for credit. Score 5 = 8 units credit and exempt Chem. 6A, 6B, 6C or Chem. 7A, 7B.	Same as Muir	Same as Muir	Same as Muir	Same as Muir. Score of 4, 5 completes natural science requirement.
CLASSICS	4–8 units of elective credit or 1–2 quarters of college Latin. (See college adviser.)	2 courses toward humanities sequence.	2 courses of the non-contiguous minor or as 8 units of elective credit.	May apply toward program of concentration requirements. See Warren adviser for details.	1 course may apply toward regional specialization. See Fifth adviser for details.
COMPUTER SCIENCE	4 units of elective credit.	Completes computing portion of operative logic requirement.	4 units of elective credit.	Same	1 course toward math/computer science requirement.
ENGLISH •Comp & Lit •Lang & Comp	Meets Subject A requirement and 8 units of elective credit. (Maximum of 8 units for both tests.)	Meets Subject A requirement and 8 units of elective credit if score is 3, 4, or 5.	Meets Subject A requirement and 2 courses of the noncontiguous minor or 8 units of elective credit.	Meets Subject A requirement and 8 units of credit if score 3, 4, 5.	Meets Subject A requirement and 8 units of elective credit if score 3, 4, 5.
HISTORY •American	8 units of elective credit; exempt History 2A, 2B.	2 courses toward humanities requirement.	2 courses toward social science requirement or 1 course of non-contiguous minor or 8 units elective credit. Satisfies American history and institutions requirement.	May apply toward program of concentration requirements. See Warren adviser for details.	8 units of elective credit.
HISTORY •European	8 units of elective credit; exempt from History 3A, 3B.	2 courses toward humanities requirement.	2 courses of the non-contiguous minor or 8 units of elective credit.	May apply toward program of concentration requirements. See Warren adviser for details.	1 course may apply toward regional specialization. See Fifth adviser for details.
FOREIGN LANGUAGE	8 elective units; determines placement in language sequence if student chooses that option; exempt two courses of the language option 1B/1BX, 1C/1CX.	2 courses toward foreign language sequence; exempt 1B/1BX, 1C/1CX.	8 units of elective credit, usually prepares student to pass proficiency exam; exempt 1B/1BX, 1C/1CX.	8 units of elective credit.	8 units of elective credit.
GOVERNMENT & POLITICS •American	1 course toward social science requirement or 4 units of elective credit. Poli. sci. majors exempt Poli. Sci. 10. Satisfies American history and institutions requirement.	See Third College academic adviser for details.	1 course toward social science requirement or 1 course of noncontiguous minor or 4 units of elective credit. Poli. sci. majors exempt Poli. Sci. 10. Satisfies American history and institutions requirement.	Same as Muir	4 units of elective credit. Poli. sci. majors exempt Poli. Sci. 10. Satisfies American history and institutions requirement.
GOVERNMENT & POLITICS •Comparative	1 course toward social science requirement of 4 units of elective credit. Poli. sci. majors exempt Poli. Sci. 11.	See Third College academic adviser for details.	1 course toward social science requirement or 1 course of noncontiguous minor or 4 units of elective credit. Poli. sci. majors exempt Poli. Sci. 11.	Same as Muir	4 units of elective credit. Poli. sci. majors exempt Poli. Sci. 11.
MATHEMATICS	AB exams 4 units = exempt Math. 2A. BC exams 8 units = exempt Math. 2A, 2B if student places high on math placement exam. (Maximum of 8 units for both tests.)	Same, also completes math. portion of operative logic requirement.	Same as Muir	Same. BC completes formal skills requirement.	Same. BC completes math/computer science requirement.
MUSIC •Listening & Lit. •Theory	8 units of elective credit; exempt 2 quarters of music sequence. (Maximum of 8 units for both tests.)	2 courses toward fine arts sequence.	Fulfills fine arts requirement and 1 course of noncontiguous minor or 8 units of elective credit.	May apply toward program of concentration requirements. See Warren adviser for details.	1 course toward fine arts requirement.
PHYSICS	B exam = 8 units elective & exempt Physics 10C exam; Mechanics, score 3, 4 = 4 units credit & exempt Physics 1A & may take Physics 2A for credit. Score 5 = 4 units credit & exempt Physics 2A & may take Physics 3A for credit. C exam; E&M, score 3,4 = 4 units credit & exempt Physics 1B & may take Physics 2B for credit. Score 5 = 4 units credit & exempt Physics 2B & may take Physics 3B for credit. (Maximum of 8 units for all three exams.)				

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



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, enrollment in courses, 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 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 their enrollment requests are received by the Office of the Registrar and space in classes 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 courses and paid registration fees.

Priority enrollment is done by telephone. Continuing students are assigned a forty-eight-hour period to enroll in courses. Priority times are assigned according to number of units completed and class level. Undergraduate student levels are determined by completion of course units:

Freshmen	0–44.9 units
Sophomores	45–89.9 units
Juniors	90–134.9 units
Seniors	135–184 units

Students will receive a *Class Confirmation* based upon the space available at the time of priority enrollment. This class confirmation is attached to the *Registration form*. Students will be held responsible for all courses appearing on the class confirmation and must make any necessary changes by the add/drop process or by appropriate withdrawal.

The top portion of the Registration form is a *Fee Statement*. Fees are due and payable upon receipt of the *Registration form*. (See "Payment of Registration Fees.")

DROPPING AND ADDING COURSES

After telephone priority and walk-in enrollment periods, students may make any necessary corrections to their class schedules by submitting a Drop/Add Card. Students may add and drop courses with no penalty 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 drop courses to the end of the ninth week of instruction with a \$3 fee. Students who wish to drop *all* their courses are required to file an Undergraduate Withdrawal/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—No fee; Change Grade Option
- 2–4: DROP ONLY—\$3.00 fee
- 5–9: DROP ONLY—\$3.00 fee with "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 192 UNITS

The minimum unit requirement for the bachelor of arts 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 requires satisfaction of additional unit requirements depending upon the student's major.

Under special circumstances, students may extend their undergraduate training beyond the minimum. However, students who are attempting to achieve more than 192 quarter-units will not be permitted to register without their college provost's approval.

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.

REGISTRATION HOLDS

A student may have a "hold" placed on his or her registration 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 registration 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 MAAC (Matthews Administrative and Academic Complex). 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 who is not an alien present in the U.S. in a nonimmigrant status which precludes you from establishing domicile in the U.S. (e.g., a B, C, D, F, H, J or M visa) and you want to be classified as a resident for tuition purposes, you must have established residence in California more than one year immediately preceding the residence determination date for the term during which you propose to attend the university, and you must have given up any previous residence.

You must also present objective evidence that you intend to make California your permanent home. 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. Physical presence within the state solely for educational purposes does not constitute the establishment of California residence, regardless of the length of your stay. Your residence cannot be derived from your spouse or your parents.

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 which 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 if you are a minor U.S. citizen or eligible alien whose parent(s) was a resident of California who left the state within one year of the residence determination date if:

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

Self-Support

You may be entitled to resident status if you are a U.S. citizen or eligible alien and either a minor or age eighteen and can prove the following:

1. you lived in California for the entire year immediately preceding the residence determination date;
2. you have been self-supporting for that year; and
3. you intend to make California your permanent home.

Two-Year Care and Control

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



diately preceding the residence determination date.

EXEMPTIONS FROM NONRESIDENT TUITION

Member of the Military

If you are a member of the U.S. military stationed in California on active duty, unless you are assigned for educational purposes to a state-supported institution of higher education, you may be exempt from the nonresident tuition fee until you have lived in California long enough to become a resident. You must provide the residence deputy on campus with a statement from your commanding officer or personnel officer stating that your assignment to active duty in California is not for educational purposes. The letter must include the dates of your assignment to the state.

Spouse or Other Dependents of Military Personnel

You are exempt from payment of the nonresident tuition fee if you are a spouse or a natural or adopted child or stepchild who is a dependent of a member of the U.S. military stationed in California on active duty. The exemption is available until you have lived in California long enough to become a resident. You must petition for a waiver of the nonresident tuition fee each term you are eligible. If you are enrolled in an educational institution

and the member of the military is transferred on military orders to a place outside California where he or she continues to serve in the armed forces, or the member of the military retires from active duty immediately after having served in California on active duty, you may retain this exemption under the conditions listed above.

Child or Spouse of Faculty Member

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

Child or Spouse of University Employee

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

Child of Deceased Public Law Enforcement or Fire Suppression Employee

You may be entitled to a waiver of the non-resident 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. Continuous attendance must be maintained at an institution while the student is establishing residence.

MAINTAINING RESIDENCE DURING A TEMPORARY ABSENCE

Your temporary absence from the state for business or educational purposes will not necessarily constitute loss of California residence unless you have acted inconsistently with your claim of continued California residence during your absence from the state. It is your responsibility to show retention of California residence during an absence from the state. Steps that you (or your parent if you are a minor) should take to retain California resident status for tuition purposes 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.

RECLASSIFICATION

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 reclassified. In addition to the indications listed above, California law requires that financial independence be included among the factors considered if you are seeking reclassification. If you are financially dependent in the current and preceding calendar years, you will be considered a California resident for reclassification purposes only if no factors exist which give evidence of your continuing residence in another state. Financial independence will not be considered for graduate students who are graduate student instructors, teaching assistants, research assistants, or teaching associates employed at 49 percent time or more.

TIME LIMITATION ON PROVIDING DOCUMENTATION

If additional documentation is required for either an initial residence classification or reclassification 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 reclassification 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, 301 MAAC, Q-021-R, La Jolla, CA 92093, or the Legal Analyst-Residence Matters, 590 University Hall, Berkeley, CA 94720. **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 ninety days of notification of the residence deputy's final decision.

PAYMENT OF REGISTRATION FEES

The university registration fee, educational fee, campus activity fee, recreational facility fee, university center fee, nonresident tuition fee (if applicable), and mandatory health insurance (if applicable) must be paid for the student to be considered registered. A student who has not registered (enrolled for classes and paid fees) prior to the end of the second week of instruction will be removed from the registrar's file and must initiate reinstatement procedures. Special permission to enroll after the end of the second week of instruction is required, and large penalty fines are assessed.

NOTE: See "Estimated Expenses for Undergraduate Residents of California."

PAYMENT OF FEES

All general university fees and deposits (university registration fee, educational fee, campus activity fee, university center fee, recreational facility fee, and health insurance if mandatory) must be paid to the Cashier's Office. Fees are due and payable upon receipt of the REGISTRATION FORM which itemizes mandatory registration fees.

All prior delinquent debts must also be paid. An optional student health insurance plan is assessed to undergraduate students with registration fees 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 prior to the first day of instruction 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 and



must receive permission to enroll. 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 Matters at 590 University Hall, 2200 University Avenue, Berkeley, California 94720.

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 re-

sult 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 specialist 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 specialist.

UNDERGRADUATE REGISTRATION

UNIVERSITY REGISTRATION FEE

The university registration fee is approximately \$650 per year for undergraduates and must be paid at the time of registration. It covers services that benefit the student and are complementary to, but not a part of the instructional program, and it includes recreational activities, student organizations, and the Student Health Service. No part of this fee is refunded to students who do not make use of these privileges. Exemption from this fee may be granted for surviving children of certain deceased California fire fighters or law enforcement officers. Students should check with the Student Financial Services Office for full ruling.

In addition, there is a campus activity fee of \$40.50 per year for undergraduates, a university center fee of \$112.50 per year for all students to be used for the construction and operation of the student centers, and a \$36 per year recreational facility fee. Graduate students are not assessed the campus activity fee, but are assessed a \$15 per year graduate student association fee.

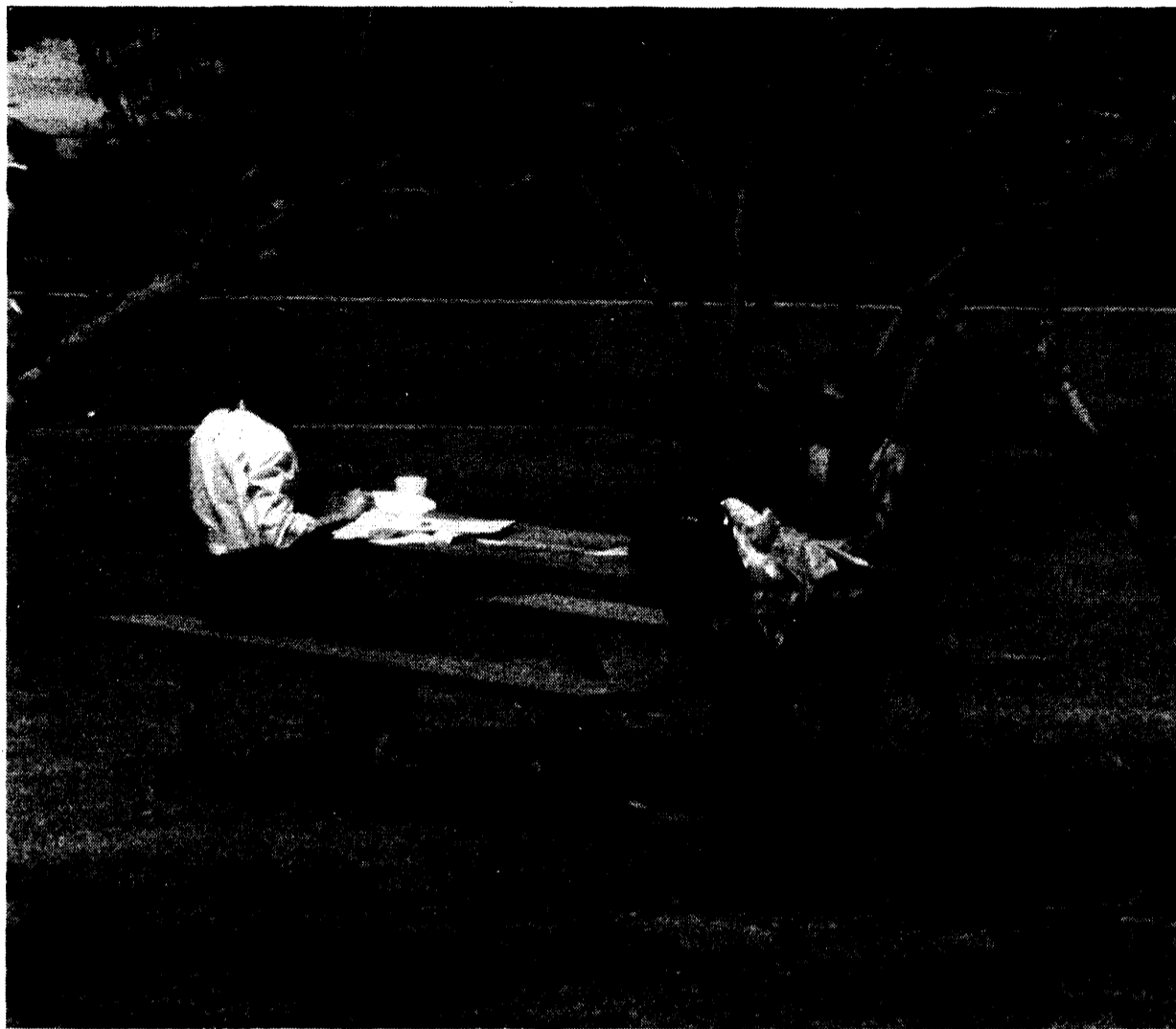
EDUCATIONAL FEE

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 \$900 per year. The educational fee may be reduced by one-half for students approved on part-time status.

MISCELLANEOUS EXPENSES, FEES, FINES, AND PENALTIES

Books and supplies average about \$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
Changes in course selection after announced dates (Drop/Add Cards)	3
Duplicate Photo I.D. Card	10
Request to Receive/Remove Grade "I"	5
Transcript of record	3
Late filing of announcement of candidacy for B.A.	3
Late enrollment	50
Return check collection	10



Late payment of fees (late registration)	50
Duplicate diploma	22
(See also "Withdrawal from the University.")	

RETURNED CHECK POLICY

Several facilities at UCSD accept personal checks for payments and/or cash. Any individual who writes checks with insufficient funds will be subject to all legal action deemed appropriate by the university. In addition, anyone who writes three or more checks to the university 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, or health.

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

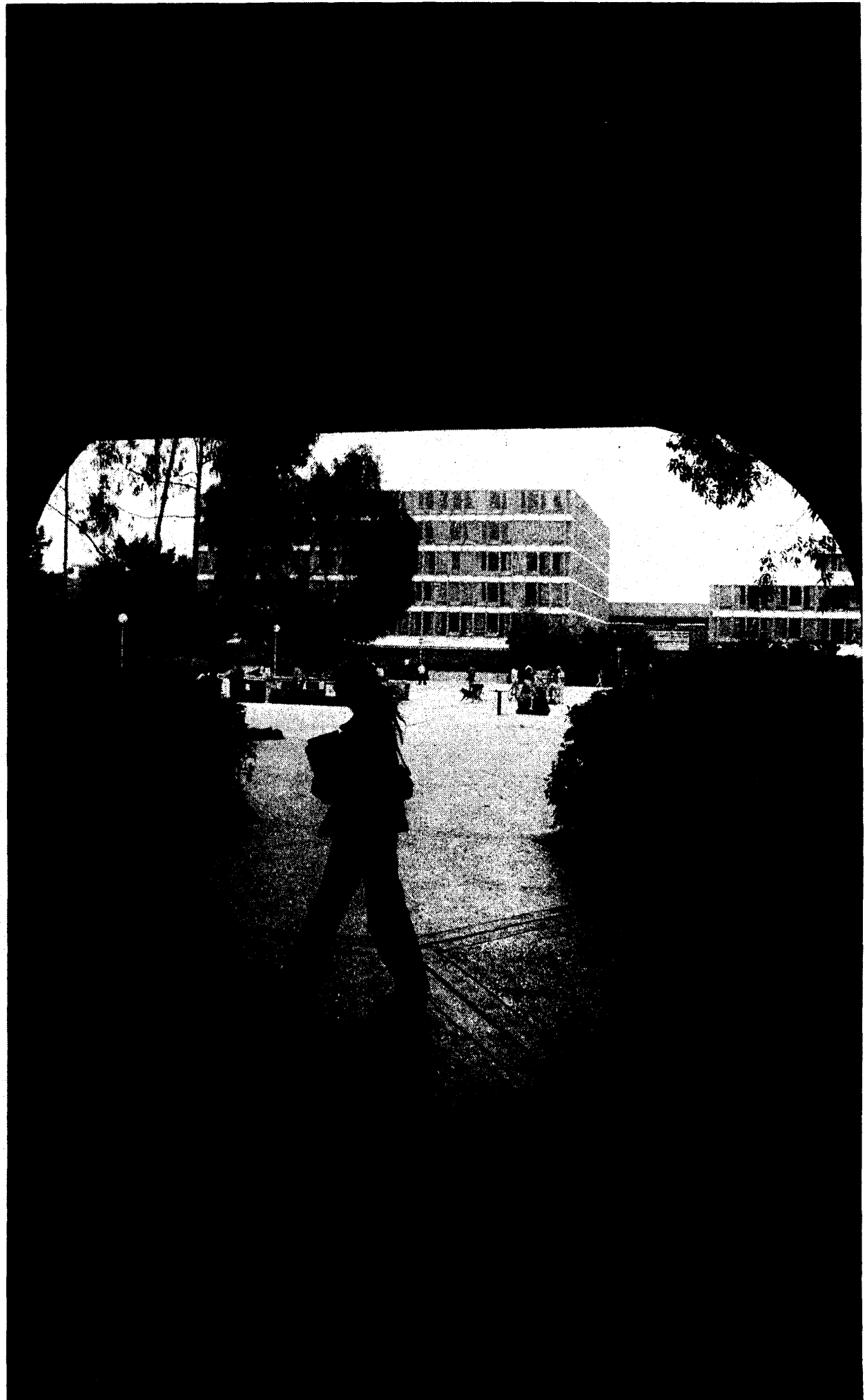
Students must apply for part-time status on the Part-Time Study application form available in the Office of the Registrar or colleges *prior to the end of the second week of the quarter*. Approval for part-time study is granted for one academic year only—fall through spring quarters, winter through spring 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.

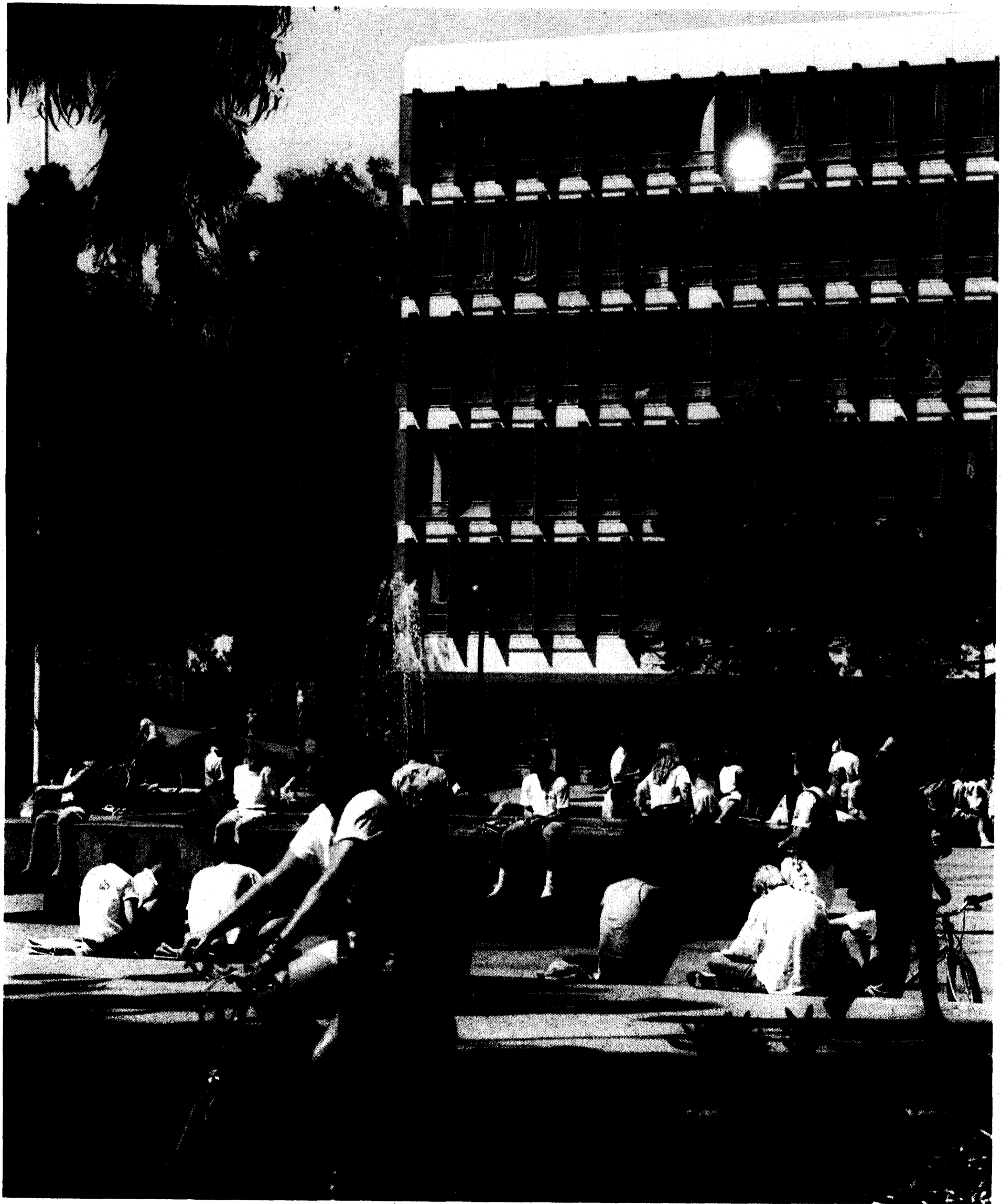
REDUCED FEES

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. Refund checks will be mailed

by the Accounting Office to all eligible students by the end of the eighth week of classes. 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

Students enrolled at UCSD from their freshman year may elect to meet as graduation requirements (UC, UCSD, college, premajor, and major requirements) either those listed in the catalog at the time of entrance or those established after entrance. Students transferring from other institutions of higher education may elect to meet as graduation requirements either those in effect at the time of transfer to UCSD, those subsequently established, or those in effect at the time of entering their other institution of higher learning, provided that the date of entrance at the previous institution is not more than three years prior to the time of transfer to UCSD. However, for departments or programs with a separate entrance procedure, the student may elect as the upper-division requirements only those in effect at the time of admission to the major or those established after admission to the major. A student who seeks readmission to UCSD more than three consecutive quarters after withdrawing from student status must either adhere to the graduation requirements at the time of readmission or those subsequently established.

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 non-University of California campuses may select to satisfy their lower-division, general-education and breadth requirements prior to transfer by completing the Transfer Core Curriculum. See "New University of California Transfer Agreements" in the "Undergraduate Admis-

sions, Policies and Procedures" section of this catalog.

REQUIREMENTS

Requirements for graduation shall be determined by the colleges in conformity with university-wide regulations and subject to approval by the San Diego Division of the Academic Senate. In addition, the following are required of all undergraduates:

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. 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 passing 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 in either American history or American government at a recognized institution of higher

education, junior colleges included, within the United States.

7. 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 the English Composition Test, an achievement test 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 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
4. 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
5. Writing a passing essay on the Subject A Proficiency Test (which is *required* of all students who have not otherwise met the requirement). This exam is administered statewide during May and on campus at the start of fall quarter. *This examination may be taken only once.*

All students who have not previously satisfied the Subject A requirement must take the Subject A Proficiency Test prior to enrollment at UCSD. Students who fail this examination must enroll each quarter in an approved Subject A course until they satisfy the Subject A requirement. Students satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition—Subject A) and by

passing the Subject A Exit Examination at the end of SDCC 1. The Exit Examination is administered by the Subject A Program office. Students whose performance on the Subject A Proficiency Test indicates they need work in English as a Second Language *must* enroll in ESL courses for three quarters (or until released by the ESL director) *before* enrolling in SDCC 1. Students must enroll in SDCC 1 (or ESL) during their first quarter of residence at UCSD. For further information on SDCC 1, refer to "Subject A" in the catalog section "Courses, Curricula, and Programs of Instruction." For further information on ESL, see the course "Ling/Eng 71" in the catalog section for the Linguistics Department.

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

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

Students who have been barred from enrollment because of failure to satisfy Subject A will be allowed to 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 of the Proficiency Test, please visit the Subject A Program office, Humanities and Social Sciences Bldg. 1004, 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, such as when a student attends classes on another UC campus as an approved visitor or participates in the UC Education Abroad Program or the San Diego Opportunities Abroad Program, exceptions may be granted by the provost.

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.

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 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 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 which courses or types of courses are 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, Chinese Studies, Economics, Quantitative Economics and Decision Sciences, History, Judaic Studies, Linguistics, Literature, Muir Special Project, Music, Philosophy, Political Science, Psychology, and Sociology.

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 chairpersons are evaluated by a subcommittee. The chairperson 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. Filing deadlines vary from college to college and may be as early as the ninth week of the quarter pre-

ceding the quarter of graduation. Students should check with their college academic advising office for exact deadlines. Advising and counseling sessions should take place well before the quarter of graduation to ensure all degree requirements will be satisfied. Applications not on file by the deadline are subject to special approval, a \$3 late filing fee, and a \$22 special order diploma fee. Students who do not meet degree requirements 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

Students in good academic standing may be permitted to register for double majors. Students must secure approval by petition and by fulfillment of the requirements (prerequisites and upper-division courses) of both programs. If, however, the majors lead to different degrees (e.g., a bachelor of arts in music and a bachelor of science in electrical engineering), the student must choose which degree is to appear on the diploma. All majors will be recorded on the diploma; the transcript will show that requirements for these majors satisfy those for possibly different degrees.

The following conditions must exist:

1. Lower-division prerequisites may overlap.
2. The equivalent of thirty-two upper-division units must be unique to each major.
3. The majors must be completed within the limit of 208 units.
4. Approval is secured from appropriate departmental advisers.

5. Approval is secured from the college provost.

Normally, students will be sophomores when the request is made in order to ensure correct planning.

With very few exceptions, double majors within the same department are unacceptable, as are double majors consisting of a departmental major and an interdisciplinary major associated with the same department.

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.

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 chairperson. 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 chairperson(s) concerned, the provost of a student's college may authorize exceptions to the limitations listed.
5. Only a grade of P or NP is to be assigned for a 197, 198, or 199 course.
6. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, a department may impose additional limitations on its supervised special studies courses.

PROCEDURES

1. Students must complete an "Application for UCSD Special Studies Course Enrollment" available in department offices, and secure instructor and department chairperson 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 methodol-

ogy 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 follow-

ing 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. NR 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

ACADEMIC REGULATIONS

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 discov-

ered. *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.*

NO REPORT/NO RECORD

An NR 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. An NR 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.")

After the Preferred-Program Request has been filed, the Drop/Add Card is used to change from letter grade to P/NP, or vice versa. The last day to add courses will be the final date to make this change.

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 between the beginning of the fifth week of instruction and the end of the ninth week of instruction of a quarter, the registrar will assign a W to the student for each course affected. Only the registrar may assign a W.

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 gradua-

tion, 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.

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.

1. Students should complete their portion of the request form, including the reason they are requesting the Incomplete which *must be for good cause*, such as illness.
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 a 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 chairperson*. 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

The Office of the Registrar will mail copies of final grades to students as soon as possible at the end of each quarter. Fall and winter quarter grades will be mailed to the local mailing address on file for undergraduates and to the major department for graduate students. Spring quarter grades will be mailed to all students' permanent addresses. Students should examine this copy of their transcript record for accuracy and report any omissions or errors to the Office of the Registrar immediately.

TRANSCRIPT REQUESTS

Application for an official transcript of record to be sent to another party or institution should be submitted to the registrar several days in advance of the time needed. An application for a transcript must bear the student's signature. A \$3 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 chairperson 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 chairperson, 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 chairperson 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 non-academic 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 in-

structor 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 non-academic 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 non-academic 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 Undergraduate 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 unauthorized aids in undertaking course work.
6. No student shall, without proper authorization, alter graded class assignments or examinations and then resubmit them for regrading.

RESPONSIBILITY

The instructor should state the objectives and requirements of each course at the beginning of the term, clearly informing students what kinds of aid and collaboration 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 separate penalties shall be imposed. The instructor shall determine the student's grade on the assignment and in the course as a whole. The customary 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 dean of Graduate Studies or the dean of students in the School of Medicine) shall impose an administrative penalty. The recommended administrative penalties are probation for the first offense and dismissal with a permanent record on the student's official university transcript for the second offense. The minimum administrative penalty is probation for one year and the establishment of a disciplinary record in the office of the appropriate dean.

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 penalty. The appropriate college dean (or the dean of Graduate Studies or the dean of students in the School of Medicine) shall also be notified and 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 to accept the proposed actions, to appeal the dean's administrative penalty, or to proceed to a formal hearing. Unless the student informs the dean and the instructor otherwise within this ten-day period he or she shall be presumed to accept the proposed actions. During this period a student may appeal the dean's administrative penalty as provided in paragraph D. A record of the administrative action taken shall be maintained in the offices of the appropriate dean.

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 to the chairperson of the department in which the alleged violation occurred. Within five calendar days the chairperson 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 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 constituted by 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 (latest edition of *University of California Policies and UC San Diego Campus Regulations Applying to Campus Activities, Organizations, and Students*). Within five calendar days, the hearing offices shall forward the Ad Hoc Committee's findings with explanations to the appropriate college dean, the dean of Graduate Studies, or the dean of students in the School of Medicine, with copies to the department chairperson, 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 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 shall dismiss the matter without further action against the student, who shall be permitted to complete the course 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. Within three calendar days of receipt of the dean's letter, the student may appeal the dean's administrative penalty as provided in paragraph D.
2. If the Ad Hoc Committee sustains the charge of academic dishonesty, the student may appeal that judgment in writing to the appropriate dean within fifteen calendar days. The basis for appeal of the Ad Hoc Committee's findings 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 the Ad Hoc Committee was improperly constituted; or
 - b. that there exists newly discovered important evidence which 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 findings of the Ad Hoc Committee shall be final.

D. *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, and by a medical student to the dean of the School of Medicine.

E. *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 Undergraduate 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 cata-

log 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 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.

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. Through an agreement with the Navy, Air Force and Army ROTC and the University of San Diego and San Diego State University, qualified students at UCSD may participate in the programs given at these universities.

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 and 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.

WITHDRAWAL/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 standing who are absent for two or more consecutive quarters must file an application for readmission no later than eight weeks prior to the beginning of the quarter at the Office of the Registrar, Matthews Administrative and Academic Complex 301. A nonrefundable fee of \$40 is charged. Applicants will be held to the same admission standards as new students admitted that quarter. A student who seeks readmission to UCSD more than three consecutive quarters after withdrawing from student status must either adhere to the graduation requirements at the time of readmission or those subsequently established.

Whereas a formal leave of absence request for undergraduates is not required at the completion of a quarter, students who wish to leave mid-quarter are required to complete the Undergraduate Application for Withdrawal or Leave form and file it with their college academic advising or dean's office. This form serves 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.

ACADEMIC REGULATIONS

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Students who decide to withdraw after the completion of a quarter and before registration fees have been paid for a subsequent quarter need not file a Request for Withdrawal form since they will be automatically withdrawn.

REFUND POLICY

NEW UNDERGRADUATE STUDENTS

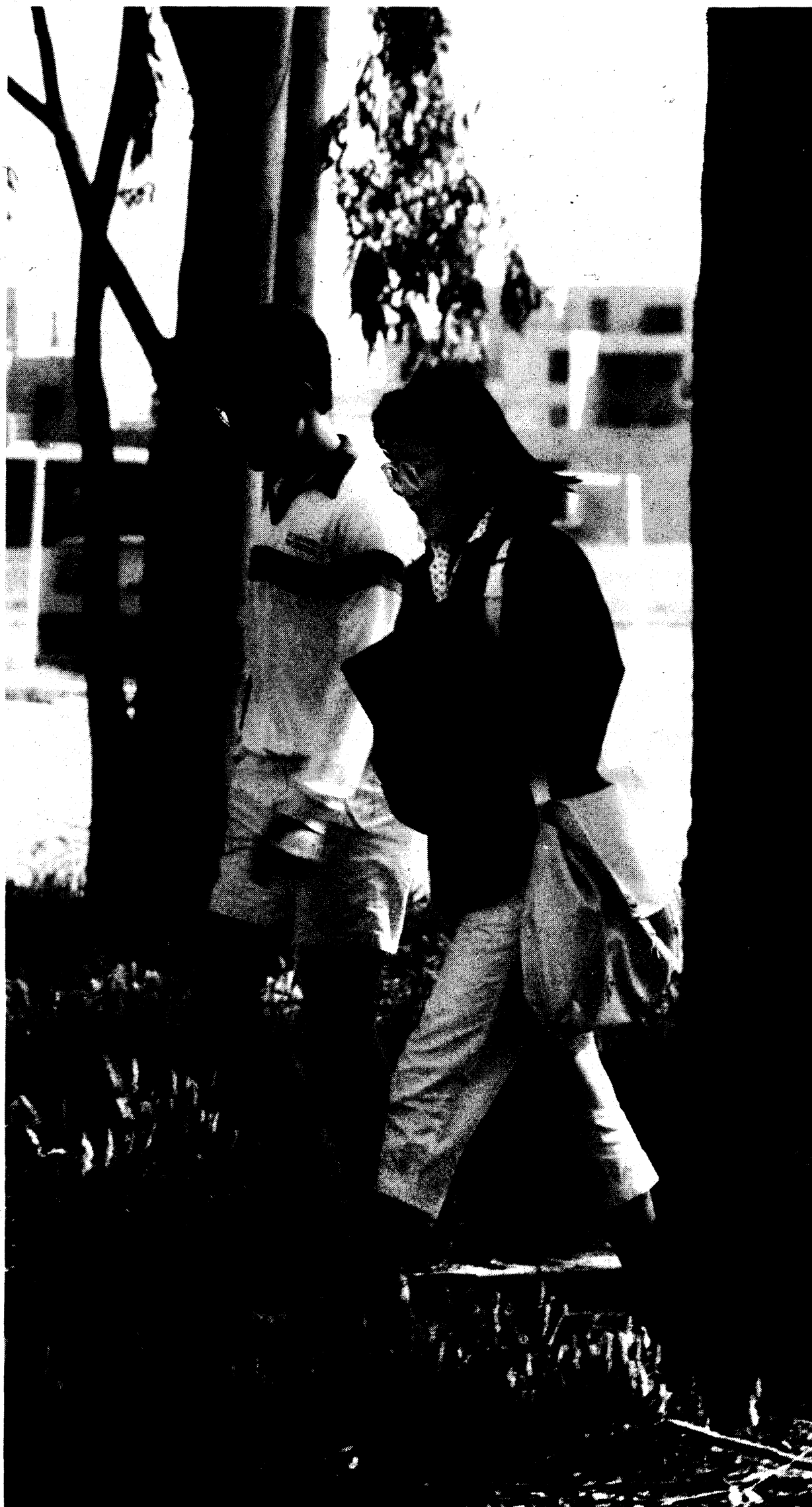
Prior to the first day of instruction, the registration fee is refunded minus the \$100 statement of intention to register fee.

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 on which the student submits his or her withdrawal form to the Office of the Registrar.



GRADUATE STUDIES



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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.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 chairperson 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 Medi-

cine—in academic, administrative, campus, and statewide areas. The GSA, composed of a president, 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 group, department, school, and campus-wide graduate student projects and social activities. Association meetings are open to all graduate students. A graduate student may apply to the GSA for assistance in resolving graduate student matters.

GRADUATE STUDENT AFFIRMATIVE ACTION

The University of California, San Diego actively recruits and admits students from those groups which have been 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. As an integral part of the fellowship experience, fellows are assigned a faculty mentor in the major department to assist them 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



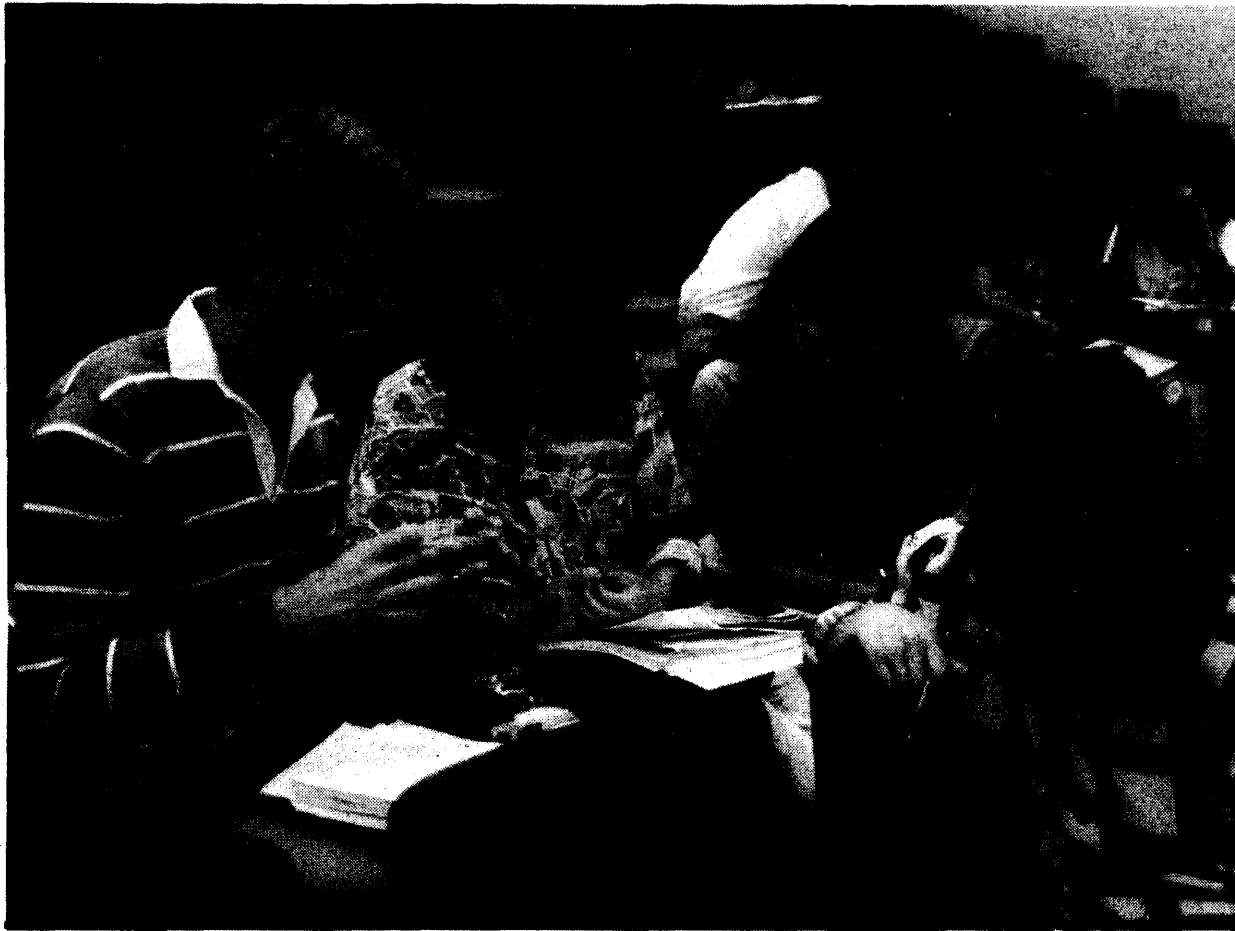
GRADUATE DEGREES OFFERED: 1990-91

Anthropology	Ph.D.*	History	M.A., Ph.D.
Biology	Ph.D.	(Judaic Studies)	M.A.
Biology	Ph.D.	International Affairs	
(Joint doctoral degree with San Diego State University)		Pacific International Affairs	M.P.I.A.
Chemistry	Ph.D.*	International Affairs	Ph.D.
Chemistry	Ph.D.	Latin American Studies	M.A.
(Joint doctoral degree with San Diego State University)		Linguistics	Ph.D.*
Clinical Psychology	Ph.D.	Literature	Ph.D.
(Joint doctoral degree with San Diego State University)		Comparative	M.A.
Cognitive Science	Ph.D.	English and American	M.A.
Communication	Ph.D.*	French	M.A.
Comparative Studies in Language, Society and Culture	Ph.D.§	German	M.A.
Computer Science	M.S., Ph.D.	Spanish	M.A.
Earth Sciences	Ph.D.*	Marine Biology	Ph.D.*
Economics	Ph.D.*	Materials Science	M.S., Ph.D.
Electrical Engineering		Mathematics	M.A., Ph.D.
(Applied Ocean Science)	M.S., Ph.D.	Mathematics (Applied)	M.A.
(Applied Physics)	M.S., Ph.D.	Statistics	M.S.
(Communication Theory and Systems)	M.S., Ph.D.	Molecular Pathology	Ph.D.
(Electronic Circuits and Systems)	M.S., Ph.D.	Music	M.A., Ph.D.
Engineering Sciences		Neurosciences	Ph.D.*
(Aerospace Engineering)	M.S., Ph.D.	Oceanography	Ph.D.*
(Applied Mechanics)	M.S., Ph.D.	Philosophy	Ph.D.*
(Applied Ocean Science)	M.S., Ph.D.	Physics	M.S., Ph.D.
(Bioengineering)	M.S., Ph.D.	(Biophysics)	Ph.D.
(Chemical Engineering)	M.S., Ph.D.	Physiology and Pharmacology	Ph.D.*
(Engineering Physics)	M.S., Ph.D.	Political Science	Ph.D.*
(Mechanical Engineering)	M.S., Ph.D.	Psychology	Ph.D.*
(Structural Engineering)	M.S., Ph.D.	Public Health (Epidemiology)	
(Systems Science)	M.S., Ph.D.	(Joint doctoral degree with San Diego State University)	Ph.D.
Engineering Sciences ^a		Sociology	Ph.D.*
(Applied Mechanics)		Teaching and Learning (Curriculum Design)	M.A.
(Joint doctoral degree with San Diego State University)	Ph.D.	Theatre	M.F.A., Ph.D.**
		Visual Arts	M.F.A.

*The master's degree may be awarded to students pursuing work toward the Ph.D. after fulfillment of the appropriate requirements. See appropriate section of catalog.

**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.



Studies and Research, 409 Matthews Administrative and Academic Complex, (619) 534-3871.

For more 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 resumé 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 resúmes, 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 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. degree offered by the Graduate School of International Relations and Pacific Studies. For course information see sections on "International Relations and Pacific Studies" elsewhere in this catalog.

REGISTRATION IN THE FINAL QUARTER FOR THE AWARD OF THE DEGREE

A student completing course work, using university facilities including the library, or making any demands upon faculty time (other than final reading of the thesis or dissertation, or administering the comprehensive or doctoral examination), must register in the final quarter in which the degree is to be conferred. Students who need only to submit their theses or dissertations, or to take the comprehensive or final examination may pay a filing fee in lieu of registration in the final quarter (see "Filing Fee.')

THE MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

The master of arts and master of science degrees are offered under two plans: Plan I, Thesis Plan 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 chairperson 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. Approval by the dean of Graduate Studies and the subsequent acceptance of the thesis by the university archivist, Special Collections, represents the final step in the completion of all requirements by the candidate for a master of 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.

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.

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, 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.")

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 eighteen quarter-units of credit required for the master of arts or master of science 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 of arts or a master of science degree at UCSD.

The maximum number of transfer units which may, upon approval of the dean of Graduate Studies, be accepted for credit toward a master of arts or a master of science degree is eighteen, regardless of the source. Course-work approved for transfer credit will not be included in calculating a student's grade point average.

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 chairperson of the department and approved by the dean of Graduate Studies, consists of three faculty members (two from the department and at least one, preferably tenured, from a different department).

When all members of the committee have approved the thesis, a Final Report of the Modified Thesis Examination, Plan III, for the Master of Fine Arts Degree must be completed. Approval by the dean of Graduate Studies and subsequent acceptance of the thesis by the university archivist, Special Collections, represents the final step in the completion of all requirements by the candidate for a master of fine arts degree on the San Diego campus.

ACADEMIC RESIDENCE

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

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

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 curriculum, 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

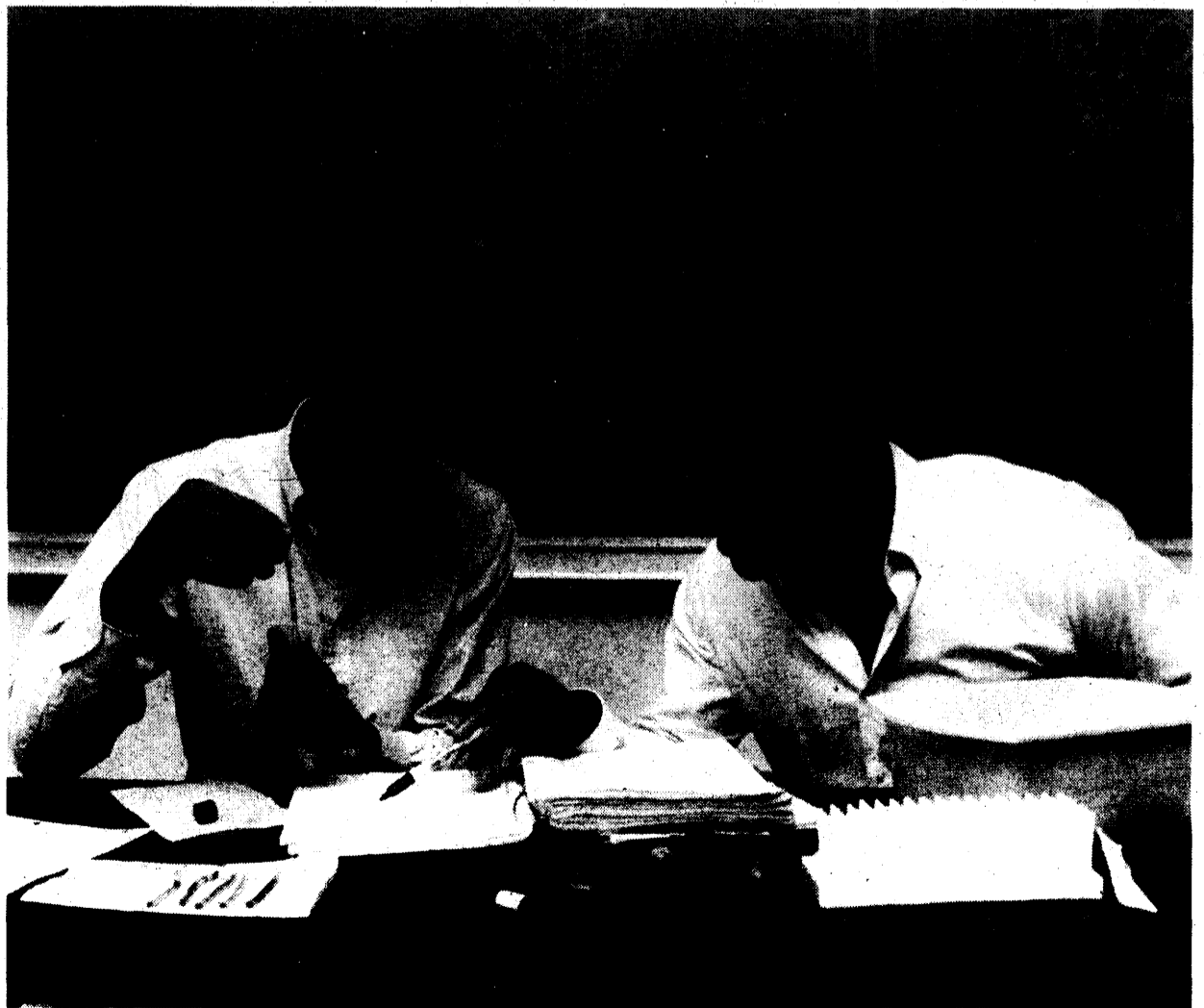
Some doctoral programs require candidates to demonstrate language proficiency in one or more languages, as part of the formal requirements for the Ph.D. degree. In these cases, the testing of proficiency is the responsibility of the department, group, or school concerned.

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 below.

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 may receive 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.")

In-candidacy educational fee grants are provided to students in the normative time program after advancement to Ph.D. candidacy and until the accrued time in graduate status exceeds the normative time. (See "Reduced Fee Enrollments.")

For purposes of calculating normative time and the maximum time during which a student may 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 the electrical engineering, computer science, or music programs. All of the following will count toward accrued time: time spent at UCSD as a master's, non-degree, or intercampus exchange graduate student; time spent on leave beyond three quarters; time spent between completion of or withdrawal from a graduate program at UCSD and re-registration in the same field of study. Pre-candidacy and total registered time limits will not accrue during periods of leave of absence and/or withdrawal in excess of three quarters.

A full description of normative time policies is given in the booklet *Normative Time to the Ph.D. and Associated Fee Grants*, October

1978 (Rev.), available in the Office of Graduate Studies and Research.

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 chairperson of the candidate's major department, group, or school no less than two weeks prior to the qualifying examination on 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 pamphlet, *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.

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 chairperson 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 represents the final step

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	Music	
(Cheical Engineering)	5	With master's from another university	4
(Engineering Physics)	6	Without master's from another university	6
(Systems Science)	5	Neurosciences	5
Biology	5	Neurosciences Ph.D.-M.D. program	7
Biology Ph.D.-M.D. program	7	Philosophy	6
Chemistry	5½	Physics	
Chemistry Ph.D.-M.D. program	7	Theoretical Physics	5
Clinical Psychology	5	Experimental Physics	6
Cognitive Science	6	Physics	
Communication	6	(Biophysics)	6
Comparative Studies in Language, Society and Culture	6	Physiology and Pharmacology	5
Computer Science		Physiology and Pharmacology Ph.D.-M.D. program	7
With master's from another university	4	Political Science	
Without master's from another university	5	Without field study	5
Economics	5	With field study	6
Electrical Engineering		Psychology	5
(Applied Ocean Science)		Psychology Ph.D.-M.D. program	7
(Applied Physics)		Scripps Institution of Oceanography	
(Communication Theory and Systems)		Oceanography	6
With master's from another university	5	Earth Sciences	6
Without master's from another university	6	Marine Biology	6
Molecular Pathology	5	Sociology	6
Molecular Pathology Ph.D.-M.D. program	7		

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 four quarters, at least three of which must be spent in 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.

CERTIFICATE OF COMPLETION

Upon request, 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.

CERTIFICATE OF RESIDENT STUDY/FOREIGN STUDENTS

In addition to a formal transcript, the Office of the Registrar will issue a Certificate of Resident Study to any foreign student whose visa status requires a return home before completion of studies in the United States. The student must have completed at least three quarters of full-time resident study not covered by a diploma or other certificate with a grade-point average of at least 2.5, and satisfactorily conducted a research program of at least nine calendar months' duration.

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.

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: bioengineering, biochemistry (in either biology or chemistry), biology, biophysics, clinical psychology, molecular pathology, neurosciences, physics, physiology and pharmacology, psychology, public health (epidemiology), and 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 de-

gree. 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,

GRADUATE STUDIES

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 intercampus graduate student exchange program are transferred to the home campus for entry on the student's official record. Library, infirmary, 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) 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 may not be considered in advance of registration and satisfactory completion of course work in a regular session.

EDUCATION ABROAD PROGRAM

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

A graduate student is eligible for the Education Abroad Program after completion, with a B average or better, of one full academic year

at a UC campus with departmental approval. Students must submit an application to the appropriate office on their home campus accompanied by required supporting documentation. Undergraduates will be given first preference when applications exceed guaranteed spaces.

Selection procedures involve an interview with members of the Education Abroad Program Selection Committee on the student's home campus and a final acceptance by the host university.

Costs vary according to location. Teaching assistantships are available occasionally at some of the overseas campuses.

Students must register, pay fees, and enroll at their home campus as well as enroll at the host university; and they must obtain clearance from their home campus student health service. 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 Opportunities Abroad Office, International Center, Matthews Administrative and Academic Complex, Q-018. In addition, the Opportunities Abroad Office also offers information and advisory services to graduate and undergraduate students inter-



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

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, is 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 and enrollment procedures may be obtained from administrative offices of departments, groups, schools, or organized research units.

FEES

For the 1990-91 academic year, the following schedule of fees will apply:

FEES PER QUARTER*

	Resident	Non-Resident
Tuition	\$	\$1,972.00
Registration	214.00	214.00
Educational	301.00	301.00
Student Center	37.50	37.50
Recreation Facility	12.00	12.00
Graduate Student Assoc.	5.00	5.00
Health Insurance	100.00	100.00
Totals	\$ 669.50**	\$2,641.50**

Miscellaneous Fees and Fines

Students should also be aware of the following charges:

Application fee for admission	\$40
Changes in Study List after announced deadline dates (Drop/Add Card)	3
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	107

*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 \$513.00 for resident students and \$1,479.50 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, Matthews Administrative and Academic Complex. 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 dean of Graduate Studies and Research.

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, Matthews Administrative and Academic Complex, 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, Q-039. 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% 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.

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. The In-Candidacy Educational Fee Grant under the normative time program provides an educational fee grant each quarter, currently \$301, for students who have advanced to candidacy for the Ph.D. degree. When the individual's accrued time in a program exceeds the normative time established for that degree by

the major department, group, or school, the candidate will resume paying full fees. (See "Normative Time Program" bulletin for complete information.)

2. 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.

3. 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.

4. 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 eligi-

ble 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 underrepresented fields such as physics and mathematics, presently 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.

Seven additional 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 \$7,500 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. A standard supplement is \$250 per month.

All other fellowship stipends are established by the departments, group, or school and may vary in tenure from one to twelve months and in stipend 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 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 employed by UCSD on a part-time basis as research assistants, teaching assistants, or language assistants.

Graduate students enrolled full-time (twelve units or more) may be employed 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 employed 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 and language assistantships do not include payment for tuition and fees in the same manner as research assistantships; however, students who have a minimum

25 percent appointment for the entire quarter as a teaching or language assistant will have their health insurance fee paid.

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, Teaching, and Language Assistants.* All salaries are taxable income.
3. *Research Assistant Tuition and Fee Remission.* RA tuition and fee remission will be excluded from taxable income based on a recently passed amendment to the Tax Act.
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 salaries 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 pro-

cessed 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 Student Aid Application for California (SAAC).

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 LOANS 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, 409 Matthews Administrative and Academic Complex. 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; 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 departmental offices, the Office of Graduate Studies and Research, or 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 univer-

sity'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 chairpersons—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 chairperson.

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 graduate 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.

NR (NO REPORT)

An NR is a computer-produced abbreviation assigned by the registrar to indicate that the student was listed on a grade report, but no grade was entered by the instructor; or that the assigned grade did not agree with a grading option approved for the student. When an NR appears on a record, the student should take steps **immediately** to see that the NR entry is removed. An NR which has not been removed by the last day of finals week in the quarter after it was assigned shall lapse to a permanent F or U grade.

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 **for reasons beyond the student's control**, e.g., illness, family emergency. 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.

For justifiable reasons such as illness or family emergency, a student may submit a General Petition to extend the Incomplete past one quarter. The petition must state the reason(s) for requesting the extension and *how* and *when* the Incomplete is to be completed.

The instructor (in lieu of the graduate adviser), the chairperson of the student's major department, and the Office of Graduate Studies and Research must approve the petition, and it must be filed with the Office of the Registrar no later than the last day of final examination week of the following quarter, or the Incomplete grade will lapse to an F or U grade. The extension cannot be made retroactively.

Incomplete grades assigned in the quarter before a graduate student withdraws or takes an approved leave of absence must be either replaced by a final grade or extended 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 be considered lapsed to Fs or Us.**

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 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 report of the quarter's grades is sent to each student at the end of fall and winter quarters. An unofficial copy of the complete transcript is sent to each student at the end of every spring quarter. 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.

PART-TIME STUDY

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.

Less than full-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." All other applicants should apply by the department, group, or school deadline specified for admission as indicated on the chart on the following page.



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 and Award Application and forward it, together with a nonrefundable application fee of \$40, to the Office of Graduate Admissions, Q-086, UCSD, La Jolla, California 92093. An application and additional program and application information are obtained from the graduate office of the program to which the applicant is applying. (Only one application is needed to apply for admission to graduate study and for a fellowship, traineeship, scholarship, or assistantship.) Detailed instructions as to how to complete the application appear within the application booklet. The documents which are required in support of an application for graduate admission are listed below.

SOCIAL SECURITY NUMBER DISCLOSURE

Pursuant to the Federal Privacy Act of 1974, applicants are hereby notified that disclosure of their Social Security number is mandatory. The Social Security number entered on the application for graduate admission is used as the applicant's identification number in the UCSD graduate student record-keeping system. This record-keeping system was established prior to January 1, 1975 pursuant to the authority of the Regents of the University of California under Art. IX, Sec. 9 of the California Constitution.

REQUIRED SUPPORTING DOCUMENTS

All supporting documents—including letters of recommendation—should be forwarded directly to the applicant's prospective major department, group, or school.

ACADEMIC RECORDS

Applicants must request that official transcripts of all previous academic work, including certification of degrees received or documentation of status upon leaving each institution, be forwarded to their prospective

GRADUATE STUDIES

UCSD LISTING DEPARTMENT/GROUP/SCHOOL PROGRAMS AND SPECIAL REQUIREMENTS: 1990-91

Graduate Departments/ Groups/Schools	Leading to the degree of	All programs require three letters of recommendation. The GRE Aptitude test is required in all programs except visual arts; some programs require additional tests as noted below. Application deadlines, application acceptance limitations, and other exceptions are noted below.
DEPARTMENT OF ANTHROPOLOGY 063 Anthropology	Ph.D.*	Fall quarter admission only. Application deadline: February 15 (January 15 for financial assistance and international applicants).
DEPARTMENT OF APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES) 032 Applied Mechanics 074 Applied Mechanics 279 Aerospace Engineering 076 Applied Ocean Science 289 Bioengineering 295 Chemical Engineering 316 Engineering Physics 331 Mechanical Engineering 340 Structural Engineering 870 Systems Science	J.D.P.# 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. M.S., Ph.D.	Contact San Diego State University. See below# Fall quarter admission only in all disciplines in AMES. For Financial Assistance and International Applicants: Application deadline January 15. U.S. Citizens and Permanent Residents not requesting Financial Assistance: Application deadline August 1.
DEPARTMENT OF BIOLOGY 116 Biology 124 Biology 124A Biochemistry	J.D.P.# Ph.D. Ph.D.	Contact San Diego State University. See below# Fall quarter admission only. Application deadline: January 15.
DEPARTMENT OF CHEMISTRY 154 Chemistry 153 Chemistry 153A Biochemistry	J.D.P.# Ph.D. Ph.D.	Contact San Diego State University. See below# Fall quarter admission only. Application deadline: February 1. GRE General and Subject (Chemistry) test required.
GROUP IN CLINICAL PSYCHOLOGY 170 Clinical Psychology	J.D.P.#	Contact San Diego State University. See below#
DEPARTMENT OF COGNITIVE SCIENCE 179 Cognitive Science	Ph.D.	Contact department for information. Application deadline: January 15.
DEPARTMENT OF COMMUNICATION 184 Communication	Ph.D.*	Fall quarter admission only. Application deadline: January 15.
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (CSE) 201 Computer Science	M.S., Ph.D.	Fall quarter admission only. Application deadline: January 15. Statement of Purpose limited to one page. GRE area exam is recommended but not required.
DEPARTMENT OF ECONOMICS 246 Economics	Ph.D.*	Fall quarter admission only. For Financial Assistance: Application deadline January 15. All Others: Application deadline: April 1.
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING (ECE) 077 Applied Ocean Science 078 Applied Physics 180 Communication Theory and Systems 000 Electronic Circuits and Systems	M.S., Ph.D. M.S., Ph.D. M.S., Ph.D. M.S., Ph.D.	Fall quarter admission only, all disciplines in ECE. Application deadlines: January 15, Communication Theory and Systems and Applied Physics; August 1, Applied Ocean Science.
DEPARTMENT OF HISTORY 429 History 430 (Judaic Studies)	M.A., Ph.D.*	Fall quarter admission only, History; Fall quarter preferred Judaic Studies. Application deadline (History): January 15. Application deadlines (Judaic Studies): Fall, August 1; Winter, November 1; Spring, February 1.
GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES (IR/PS) 481 International Relations 486 Pacific International Affairs	Ph.D. M.P.I.A.	Fall quarter admission only. Application deadline: January 15. GMAT scores may be substituted for GRE scores; LSAT scores may be used as an additional supporting document; additional supplementary materials required, request from IR/PS.
GROUP IN LATIN AMERICAN STUDIES 498 Latin American Studies	M.A.**	Fall quarter admission only. Application deadline: January 15.
DEPARTMENT OF LINGUISTICS 510 Linguistics	Ph.D.*	Fall quarter admission only. Application deadline: January 15.

Graduate Departments/ Groups/Schools	Leading to the degree of	All programs require three letters of recommendation. The GRE Aptitude test is required in all programs except visual arts; some programs require additional tests as noted below. Application deadlines, application acceptance limitations, and other exceptions are noted below.
DEPARTMENT OF LITERATURE 513 Literature 192 Comparative 522 English and American 523 French 525 German 528 Spanish	Ph.D.** M.A. M.A. M.A. M.A. M.A.	Fall quarter admission only Ph.D. program, all quarters M.A. program. Application deadlines: January 15, Ph.D.; two months prior to the beginning of the quarter, M.A.
GROUP IN MATERIALS SCIENCE 327 Materials Science	M.S., Ph.D.	Fall quarter admission only. Application deadline: January 15.
DEPARTMENT OF MATHEMATICS 072 Applied Mathematics 540 Mathematics 891 Statistics	M.A. M.A., Ph.D. M.S.	Fall quarter admission only. Application deadlines: Financial Assistance, February 1; no Financial Assistance requested, June 1 (International Applicants), August 1 (U.S. Citizens and Permanent Residents).
GROUP IN MOLECULAR PATHOLOGY 350 Molecular Pathology	Ph.D.	Fall quarter admission only. Application deadline: March 15.
DEPARTMENT OF MUSIC 579 Music	M.A., Ph.D.	Fall quarter admission only. Application deadline: January 15. GRE Subject (Music) test, supporting musical documents required.
GROUP IN NEUROSCIENCES 594 Neurosciences	Ph.D.*	Fall quarter admission only. Application deadline: January 1. A GRE Subject (Chemistry Biology, etc.) test recommended.
DEPARTMENT OF PHILOSOPHY 651 Philosophy	Ph.D.*	Fall quarter admission preferred. Application deadlines: Fall Quarter; June 1 (International Applicants), August 1 (U.S. Citizens and Permanent Residents); Winter Quarter; September 1 (International Applicants), November 1 (U.S. Citizens and Permanent Residents); Spring Quarter; February 1.
DEPARTMENT OF PHYSICS 666 Physics	M.S., Ph.D.	Fall quarter admission preferred. Application deadlines: Fall Quarter, March 1; Winter Quarter, October 1; Spring Quarter, January 2. GRE Subject (Physics) test required.
GROUP IN PHYSIOLOGY AND PHARMACOLOGY 676 Physiology and Pharmacology	Ph.D.*	Fall quarter admission only. Application deadline: January 15. GRE Subject (Chemistry) test required.
DEPARTMENT OF POLITICAL SCIENCE 699 Political Science	Ph.D.*	Fall quarter admission only. Application deadline: January 15.
DEPARTMENT OF PSYCHOLOGY 391 Psychology	Ph.D.*	Fall quarter admission only. Application deadline: January 2.
GROUP IN PUBLIC HEALTH (EPIDEMIOLOGY) 000 Epidemiology	J.D.P.#	Contact San Diego State University. See below#
DEPARTMENT OF THE SCRIPPS INSTITUTION OF OCEANOGRAPHY 845 Scripps Institution of Oceanography	Ph.D.*	Fall quarter admission preferred. Application deadline: January 15.
DEPARTMENT OF SOCIOLOGY 867 Sociology	Ph.D.*	Fall quarter admission only. Application deadline: January 15. Writing sample required.
GROUP IN TEACHER EDUCATION 898 Teaching and Learning 899 Teaching and Learning (Curriculum Design)	M.A. M.A.	Fall quarter admission Teaching and Learning; Summer admission Curriculum Design. Application deadline: April 15. A current teaching or educational assignment for the duration of the graduate program is required.
DEPARTMENT OF THEATRE 565 Theatre	M.F.A., Ph.D.**	Fall quarter admission only. Application deadline: January 31. GRE not required for acting; GRE Subject (Literature) test required for applicants to directing program.
DEPARTMENT OF VISUAL ARTS 924 Visual Arts	M.F.A.	Fall quarter admission only. Application deadline: January 15. Original or reproduction of work; i.e., slides, films, video cassette or critical papers; three-page statement of purpose.

* The master's degree may be awarded to students pursuing work toward the Ph.D. after fulfillment of the appropriate requirements.
 ** Approval pending.
 # For information and application for all Joint Doctoral Programs please write to: Graduate Division, San Diego State University, San Diego, CA 92182-0419. **PLEASE NOTE: THESE ADMISSIONS MATERIALS ARE TO BE COMPLETED FOR THE JOINT DOCTORAL PROGRAMS ONLY AFTER STUDENTS HAVE BEEN ADMITTED TO THE PROGRAMS BY SAN DIEGO STATE UNIVERSITY.**

major department. Transcript labels are enclosed in the application packet for this purpose. Applicants should insert the name and address of their proposed major department, group, or school, leaving a transcript label with the registrar of an issuing institution. Only official records bearing the signature of the registrar and the seal of the issuing institution will be accepted. Applicants with academic work in progress who expect to complete a degree program before the intended date of enrollment at UCSD **must submit evidence of degree conferral** and a final academic record, as soon as they are available.

SPECIAL NOTE TO FOREIGN APPLICANTS

In all applications for graduate admission, official records bearing the signature of the registrar or other responsible academic officer and the seal of the issuing institution are required. However, true copies, facsimiles, or photostatic copies of **foreign academic records** will be accepted if, after the copies have been made, they have been personally signed and stamped by an educational official **who certifies that they are exact copies of the original document**. Properly signed copies should be sent instead of irreplaceable original documents. Unless academic records are issued in English by the institution itself, **certified English translations must accompany official documents written in a language other than English**.

Foreign academic records should show all courses attended each year, examinations passed, seminars completed, and grades or marks received in all institutions where formal records are maintained. Official evidence of degree conferral must also be supplied, together with evidence of rank in class if possible.

GRADUATE RECORD EXAMINATIONS (GRE) SCORES

Applicants who are applying for admission to a department, group, or school which requires that they take the GRE (see Graduate Application for Admission and Financial Aid Information and Instruction Sheet) 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 ad-

ministrative 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 department or group to determine if letters of recommendation are still on file.

FOREIGN APPLICANT FINANCIAL STATEMENT

Foreign applicants are required to certify that they possess sufficient funds to cover all fees, transportation, and living expenses during the first academic year of graduate enrollment at UCSD. In addition, they must certify as to the probability of funds for subsequent years of study. A Foreign Applicant Financial Statement, for the purpose of indicating the amount and source of funds available for graduate study, is forwarded to foreign applicants upon acceptance 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, Library East, Room 405, 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: \$10*

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, Library East, Room 405, 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 depart-

ment, 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

Students who are admitted and fail to register in the quarter for which they first apply may request reconsideration of their application for a later quarter within the same academic year. Application for admission 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. In no case are application files retained for more than four consecutive academic quarters from the date of first admission. 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. 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. 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 purchase at the University Bookstore several weeks before the beginning of the quarter.

PREFERRED ENROLLMENT REQUEST/REGISTRATION

In advance of each quarter of registration, a student must complete the Preferred Enrollment Request form included in the current *Schedule of Classes*, listing correct course codes for all course work, independent study, or research to be undertaken that quarter. The Preferred Enrollment Request form must be approved by the graduate adviser and filed with the Office of the Registrar.

Once the Preferred Enrollment Request form is filed with the Office of the Registrar, it constitutes enrollment in courses, and each student will receive official confirmation of class enrollments on the Registration form. Only successfully completed course work appearing on the Class Confirmation will be credited toward a degree. Unofficial withdrawal from a course listed on the Class Confirmation will result in a failing grade.



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 Matthews Administrative and Academic Complex; 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

A student is not officially registered for classes **until the entire registration procedure outlined below has been completed. Each quarter a graduate student must:**

1. Complete the Preferred Enrollment Request form contained in the current *Schedule of Classes* (available from the University Bookstore), obtain the graduate adviser's signature, and file it with the Office of the Registrar prior to the posted deadline for enrollment. Preferred Enrollment Request forms filed with the registrar after the deadline date, the end of the second week of instruction, will require a \$50 late fee.
2. Obtain a Registration form from the major department, take the Fee Statement portion of the form to the Cashier's Office, and pay fees for the current quarter before the deadline date (prior to 3:00 p.m. the fourth day of classes). Registration fees paid after the fourth day of instruction will require a \$50 late fee in addition to the normal registration fees.

Note to Fellowship, Scholarship, or Traineeship Holders:

Fee Payment Authorization forms (for payment of required fees and/or tuition) and Registration forms will be sent to the major department, group, or school prior to the start of each quarter. The student will take the Fee

Payment Authorization form along with the Registration form to the Central Cashier to complete fee processing. Graduate students with partial fee or tuition awards should include payment of the balance necessary to pay required fees in full.

Fellowship, scholarship, or traineeship holders must enroll in and maintain full-time enrollment status (at least twelve units per quarter).

The Cashier's Office will not accept payment if you owe a library fine, past-due housing bills, etc. It is important to clear these items so that payment may be made at the Cashier's Office before 3:00 p.m. on the fourth day of instruction.

Note to Teaching and Research Assistants:

TAs, LAs, 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 well in advance of fee payment deadlines.

Students who have a research assistantship and are eligible for RA tuition and fee remission obtain the Fee Payment Authorization form from departmental graduate coordinators.

3. 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 Matthews Administrative and Academic Complex, 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.

4. 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.)**

5. 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 following quarter, or, in the case of an Incomplete, a valid extension has been granted. 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 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. An additional quarter of registration after reinstatement to candidacy is required before the Ph.D. may be conferred.

LATE REGISTRATION

Students will be assessed late fees if not enrolled and registered by the registrar's published deadline dates each quarter.

A \$50 late registration fee will be assessed if the student has not completed registration (paid fees) **prior to 3:00 p.m. on the fourth day of instruction as outlined in the Academic Calendar and the *Schedule of Classes***.

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

Drop/Add 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.

Drop/Add Cards must be completed in full and include correct course information and course codes as listed in the current *Schedule of Classes*. When changing units in a variable-unit course, a student must drop the course first, then add it with the correct number of units.

After the Preferred Enrollment Request form has been filed with the registrar, a 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 a Drop/Add 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 student may drop a class up to the end of the ninth week of classes by filing a Drop/Add Card with the registrar, **after** first notifying the instructor, and obtaining the approval of the graduate adviser or department and the dean of Graduate Studies. A processing fee is assessed after the second week of instruction (see "Fees"). 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 chairperson.

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 when applicable.

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) 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,

chairperson 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 complete medical examination requirements, to provide final undergraduate transcripts, or other related matters.

BAR FROM REGISTRATION/ ACADEMIC

Academic disqualification is determined by the dean of Graduate Studies on recommendation of the chairperson of 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

EDUCATION ABROAD PROGRAM (EAP)

International Center (corner of Hutchison Way and Gilman Drive)
Mail code Q-018
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 Opportunities 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 Q-018
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 Q-018
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.

INSTRUCTIONAL COMPUTING CENTER

Applied Physics and Mathematics Building, first floor
Mail code C-010
534-4050

The Instructional Computing Center provides a wide range of computer services to support instruction, research, and administration, and provides administrative data to academic departments through its Academic Computing Services group.

Instruction and research computing is done on DEC, HP, AT&T, SUN, and CCI minicomputers using either VMS or UNIX operating systems. Microcomputer support for instruction is available in MS-DOS and Macintosh labs. With these systems, students and researchers have access to the various computer lan-

guages, statistical packages, and mathematical libraries. Graphics facilities include interactive graphics terminals, four-color hardcopy plotting which use popular software packages. Basic text formatting programs are available for term papers and the like. More advanced text-processing facilities for thesis production, journal articles, and book manuscripts are available on UNIX and VMS systems.

Most users access the computer systems by using interactive terminals which are located in terminal rooms (students have priority), laboratories, libraries, and private offices around campus. Impact and laser printers in the terminal rooms are networked so that users of the computer systems can direct output to a nearby printer. Dial-in telephone lines are available for off-campus use or 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.

OASIS (OFFICE OF ACADEMIC SUPPORT AND INSTRUCTIONAL SERVICES)

OASIS Main Office
Galbraith Hall
Room 1058
Mail code B-036
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 Success Program (ASP)

ASP 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, ASP 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*

Reading and Study Skills Program

The Reading and Study Skills Program 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 Main Office, extension 43760
Galbraith Hall, Room 1058*

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, re-

search 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 Second Story, extension 42284
Undergraduate Sciences Bldg., Room 4070*

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 Second Story, extension 42284
Undergraduate Sciences Bldg., Room 4010*

The Scholars' Writing Workshop

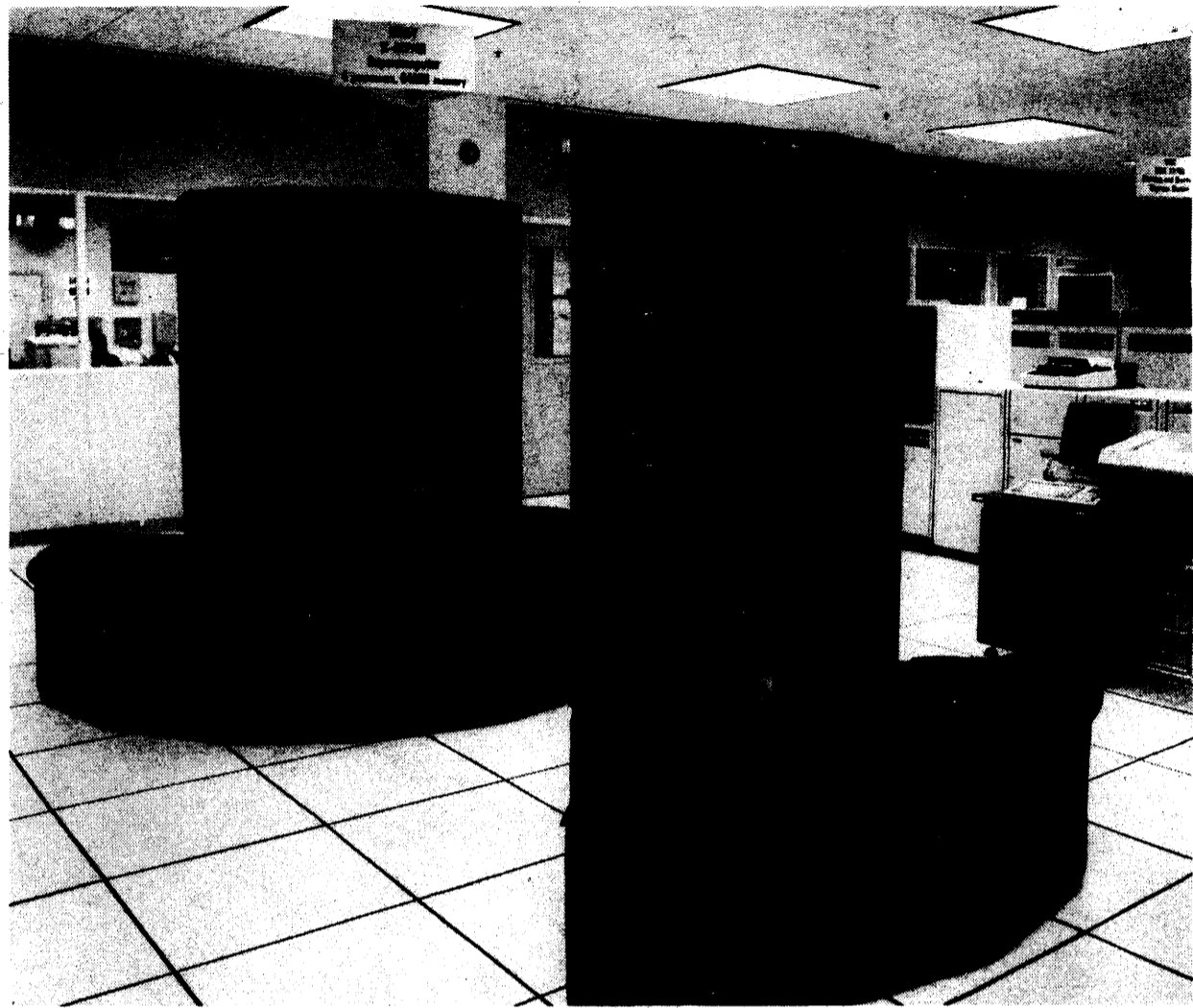
Students who are committed to achieving academic excellence as writers and who wish intensive, individualized help and group feedback on written assignments can participate in the Scholars' Writing Workshop. Services include weekly workshops and individual conferences.

*OASIS Second Story, extension 42284
Undergraduate Sciences Bldg., Room 4070*

OFFICE OF INTERNATIONAL EDUCATION

International Center
(corner of Hutchison Way and Gilman Drive)
Mail code Q-018
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 Opportunities 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 services for all members of the UCSD community. These include lectures, language exchanges, linkages with international faculty specialists, and weekly international cafe lunches which are open to the entire campus.

OPPORTUNITIES ABROAD PROGRAM (OAP)

International Center (corner of Hutchison Way and Gilman Drive)
Mail code Q-018
534-1123

The Opportunities Abroad Program (housed in the Opportunities Abroad Office, along with the Education Abroad Program) provides UCSD students with information and advisory services enabling them to study, work, and travel abroad. Programs are available for students in all majors, for periods ranging from a quarter to a full academic year. Students participating in academic programs abroad sponsored by institutions other than the University of California transfer credit back to UCSD, and

receive assistance with this and other preparations 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. When participating in non-UC academic programs abroad, students maintain their eligibility for UCSD financial aid by arranging for concurrent enrollment at UCSD through OAP.

SAN DIEGO SUPERCOMPUTER CENTER

SDSC Building
Mail code D-005
534-5000

In 1985, the National Science Foundation (NSF) selected UCSD as one of five sites for national supercomputer centers. The NSF centers program was established to provide scientists and engineers with access to leading-edge computational capabilities, as well as provide education and training for students, researchers, and industry on how effectively to use supercomputers.

The state of California has provided \$6 million to establish a world-class Advanced Scientific Visualization Lab (Vis-Lab), with the



capability to apply state-of-the-art computer graphics to scientific visualization problems. Classes will be initiated that use the state-of-the-art scientific visualization tools available at the Vis-Lab.

The San Diego Supercomputer Center (SDSC), operated for UCSD by General Atomics, is under the direction of Sidney Karin, with approximately eighty full-time staff. The center serves nearly 3,000 researchers and educators located at over 140 research institutions in forty-four states and the District of Columbia. Policy guidance is provided by a steering committee representing a consortium of twenty-five academic and research institutions, including UCSD and the other eight UC campuses.

RESEARCH AND DEVELOPMENT

The computational research performed at SDSC spans many scientific disciplines, including biology and chemistry; math and computer science; a wide range of engineering disciplines; many branches of physics; and visualization.

The SDSC staff scientists welcome opportunities for collaborating with their colleagues in academia and industry. In addition, an SDSC fellowship program is open to graduate and undergraduate students, as well as post-doctoral research associates, faculty, and scientists from industrial and government laboratories.

COMPUTATIONAL FACILITIES

Computing resources center around a CRAY Y-MP8/864 supercomputer, one of the newest generation supercomputers from Cray Research, Inc. The CRAY Y-MP computer runs the UNICOS operating system version of UNIX (adapted for Cray computers). Features include:

1. 6 nanosecond clock cycle.
2. 8 CPUs delivering about 56,000 CPU hours to users per year.
3. 512 million bytes of shared memory.
4. 1024 million bytes of solid state storage.
5. Powerful input/output subsystem with 100 megabyte/second channels.

SYSTEM SOFTWARE AND LANGUAGES

A full set of UNICOS operating system functions and utilities are available for interactive and batch processing. These utilities are based on both System V UNIX from AT&T with



extensions from the Berkeley Software Distribution (BSD 4.2). Fortran 77 is the primary language, with Pascal and C also available.

APPLICATIONS SOFTWARE

SDSC has an extensive applications software collection to support numerous scientific disciplines—more than 100 packages and subpackages are supported by SDSC, and many have interfaces to improve their ease of use. New applications packages are evaluated and added to this collection regularly.

LONG-TERM FILE STORAGE

DataTree, an enhanced version of the Common File System developed at Los Alamos National Laboratory, is the long-term file storage system used at SDSC. DataTree consists of 60 GBytes of disk storage controlled by an IBM 4381 computer and supported by a 1.2 TByte Storage Tek 4400 Data Library (cartridge robot).

ACCESS TO SDSC

SDSC is connected to the campus networks using the TCP/IP suite of protocols. As a result, UCSD researchers are able to collaborate with colleagues located at other locations via the TCP/IP-based Internet, which links major U.S. research institutions. Internet includes the

NSFNET backbone with high-speed access between the NSF-funded supercomputer centers and the mid-level regional networks, e.g., CERFnet (California Education and Research Federation Network). Access is also available via DECnet, TYMNET, and direct dial telephone.

ALLOCATION OF RESOURCES

Allocations are made by a peer-review process of the research proposals. Proposals are judged on the following criteria:

1. Merit of the proposed research and its contribution to scientific knowledge.
2. Potential for successful completion of the research.
3. Appropriateness of the SDSC computer resources for the research.

In addition, UCSD has block grants from which SDSC resources are made available to faculty and students. For more information, contact Donald W. Anderson, dean of Natural Sciences, or M. Lea Rudee, dean of Engineering.

UCSD EXTENSION

9600 North Torrey Pines Road
(on the UCSD campus north of Muir College)
Mail code X-001
534-3400

UCSD Extension 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. UCSD Extension provides advanced learning opportunities for educated and professional people, including courses, seminars, workshops, institutes, conferences, and study tours. Annual enrollment is approximately 35,000. With the exception of specific grant-funded programs, UCSD Extension is supported by course fees and receives 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 UCSD Extension, phone 534-3400 for a free *Explore* catalog. Among the many programs that compose the UCSD Extension curriculum are:

CONTINUING PROFESSIONAL EDUCATION

Courses and certificate programs are offered in a wide range of fields including microcomputer engineering, management, accounting, 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, and learning handicapped, 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, Science and Mathematics Teacher Institutes funded by NSF and local

foundations 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, the Program in Technology and Entrepreneurship 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. The Returning Scholars Program provides an opportunity for serious adult students to enroll in campus courses and attend faculty-led discussion groups.

ENGLISH LANGUAGE PROGRAM

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.

HEALTH MANAGEMENT

In the 1980s, health has emerged as a critical issue, from the economic and sociological as well as medical perspectives. UCSD Extension offers advanced and continuing education courses for health professionals, the Professional Development Series in Health Care Management for health industry administrators, 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. Program offerings include national conferences, professional development courses, the annual Summer School of Alcohol and Other Drug Studies, and court-ordered drinking driver education classes.

LEGAL ASSISTANT TRAINING PROGRAM

Both daytime and evening programs are now 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.

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.

CAMPUS SERVICES AND FACILITIES

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.

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.

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 IR/PS Library, the Undergraduate Library, and the Slide Collection.

COMBINED UCSD LIBRARY STATISTICS, 1989

Volumes	1,888,207
Periodical and other serial publications received	30,225
Government documents	378,431
Maps	259,209
Microforms	1,820,193
Phonorecords, tapes, cassettes	54,206
Slides and other pictorial items	206,301

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. Individual and group tours of the libraries can be arranged through the reference librarians.

The Interlibrary Loan Service locates and borrows materials not held at UCSD. This service is available to all faculty, staff, and students of the university. Our students enjoy direct borrowing privileges at the other UC campuses. A small jitney bus that transports library materials daily to and from the library is available to members of the UCSD community as space allows.

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 like Biological Abstracts, ERIC, Medline, and Psychological Abstracts. Contact the reference departments of the Central University Library or any science library for this service and the procedure for using it.

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

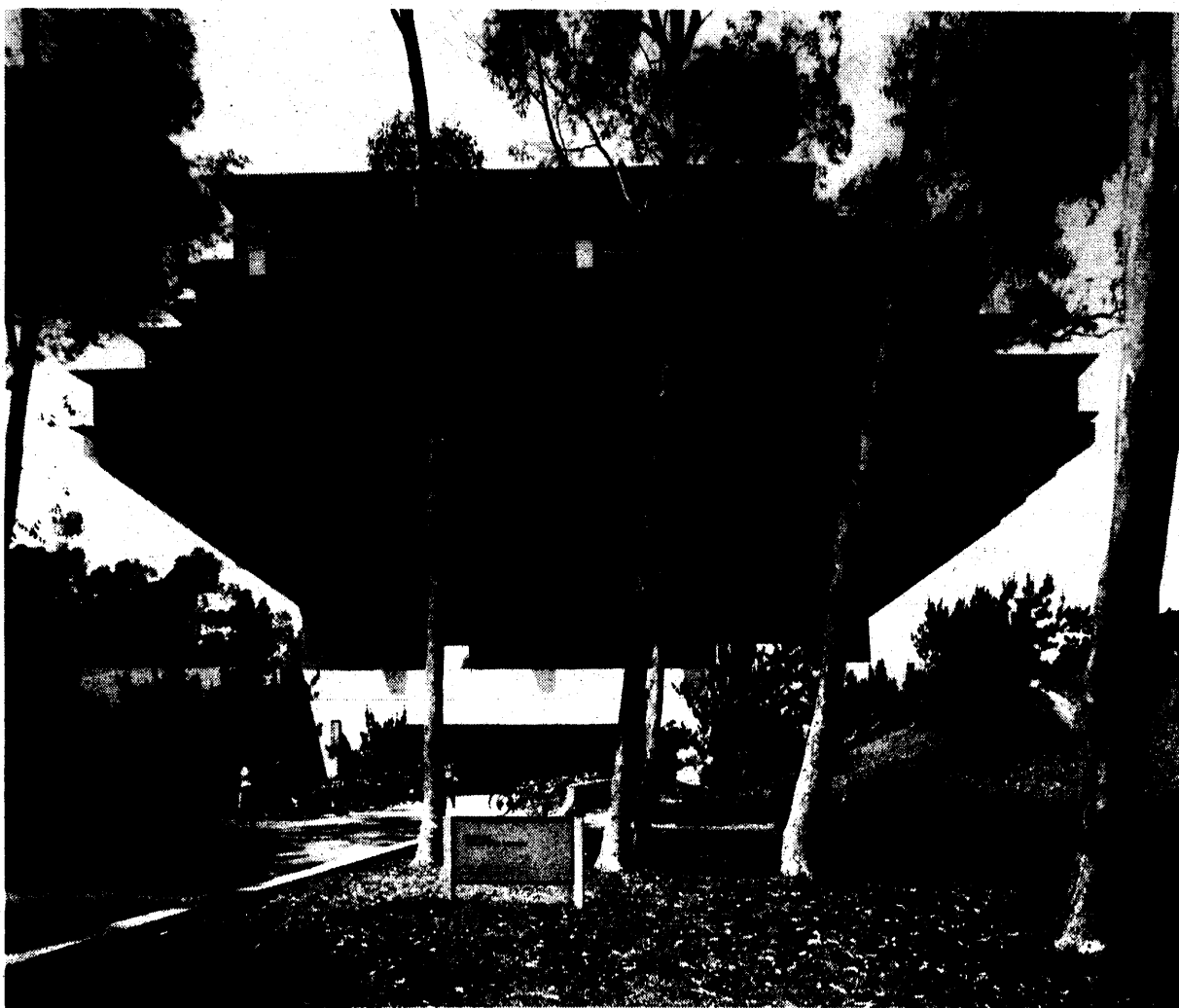
NOTE: Call 534-3837 for an up-to-date schedule of open hours for all libraries (recorded message).

CENTRAL UNIVERSITY LIBRARY

(located north of the Matthews Administrative and Academic Complex and east of Third College)

Mail code C-075-R
534-3336

The Central University Library houses the research collections in the social sciences, humanities, and fine arts (1,217,775 v.). Its Reference and Research Services contains an outstanding collection of bibliographies, indexes, encyclopedias, biographical directories, and other information resources. The Documents Department is a depository for the official publications of California, the United States, United Kingdom and the United Nations, and also contains a major topographical and political map collection. A listening facility in the Music Collection 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

Urey Hall, Revelle College
Mail code C-075-E
534-3258

The Science and Engineering Library contains strong collections in the physical sciences and technology (165,730 v.). Of particular importance are its research materials in chemistry, computer science, electronics, engineering, mathematics, physics, space sciences, and nuclear energy.

BIOMEDICAL LIBRARY

Basic Science Building, School of Medicine
Mail code C-075-B
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 (175,300 v.). A branch library, the Medical Center Library (26,400 v.), supports the activities of health care providers at the UCSD Medical Center in the Hillcrest area of San Diego. Mail code H-828, 543-6520.

SCRIPPS INSTITUTION OF OCEANOGRAPHY LIBRARY

Mail code C-075-C
534-3274

Scripps Institution of Oceanography Library is the largest marine science library in the world (211,000 v.). 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 C-075-D
534-3065

Undergraduate Library has a general collection (81,494 v.) 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 (2,214 audio; 442 video) and reserve materials used by faculty in their classes.

THE SLIDE COLLECTION

Mandeville Center
Mail code C-075-F
534-4811

This collection has been developed to provide visual materials for on-campus instructional purposes. It includes over 170,000 slides covering all periods of art history in architecture, sculpture, painting, and the minor arts, as well as other subjects in the arts, humanities, social sciences, and sciences.

STUDENT SERVICES AND PROGRAMS

VICE CHANCELLOR, UNDERGRADUATE AFFAIRS

Building 112 Matthews Administrative and Academic Complex
Mail code Q-015
534-4370

The Office of the Vice Chancellor of Undergraduate Affairs is responsible for the overall quality of student life at UCSD. 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 B-030
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 overlapping, 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**
 - a. *Job Listings*—On and off campus job vacancies
 - b. *On Call Services*—For students interested in short-term employment
 - c. *Student Corps Services*—Temporary on-campus employment through campus departments
 - d. *Co-ops/Internships*—Paid, pre-professional employment experiences
 - e. *Special Assistance*—Individual help in finding desirable part-time employment
2. **Career Advising**
 - a. *Career Planning*—SIGI, career survey, career consultants, skills and decision-making workshops, all-day seminars, career fair.
 - b. *Job Search Preparation*—resume writing, interviewing, and job search strategy workshops. Video-taped mock interviews.
 - 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, special events, fairs, catalogs.
- b. *Admissions Preparations*—Applications for admissions tests, personal statement assistance, interview preparation.
- c. *Reference Files*—method to collect and distribute letters of recommendation.
- d. *Special Assistance*—Individual assistance with career concerns related to professional and graduate school admissions.

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

COLLEGE DEANS' OFFICES

Revelle, Mail code B-021, 534-3493
Muir, Mail code C-006, 534-3587
Third, Mail code D-009, 534-4390
Warren, Mail code Q-022, 534-4731
Fifth, Mail code Q-069, 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.

DISABLED STUDENT SERVICES

Building 204 Matthews Administrative and Academic Complex

Mail code Q-019

534-4382/534-2494 (TDD)*

*(Telephone for the deaf ONLY)

See "Undergraduate Affairs/Special Services Center" later in this section.

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.

The Student Financial Services Office is divided into five 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 Services Office also includes the scholarship office and the office of veterans' affairs. The pur-

pose 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.

Revelle College, 204 Matthews
Administrative and Academic Complex
(619) 534-3806

Muir College, 210 Matthews Administrative
and Academic Complex 534-3808

Warren College, 214 Matthews
Administrative and Academic Complex
534-4686

Third College, 213 Matthews Administrative
and Academic Complex 534-3805

Fifth College, 214 Matthews Administrative
and Academic Complex 534-2550

Graduate Division, 204 Matthews
Administrative and Academic Complex
534-3807

Scholarship Office, 213 Matthews
Administrative and Academic Complex
534-3263

School of Medicine, Medical Teaching
Facility 534-4665

Veterans Affairs, 210 Matthews
Administrative and Academic Complex
534-4483

Applications and requests for information should be addressed to the appropriate area of the Student Financial Services Office as follows: Student Financial Services Offices, Q-013, Attn: (*Your undergraduate college name or graduate division*), University of California, San Diego, La Jolla, California 92093.

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 academic 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 SAT scores, Achievement Test scores, grade-point average, 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 and awarded \$119,300 to 140 National Merit Finalists attending UCSD in 1989-90. 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, which is composed of UCSD faculty members, selects the recipients with emphasis on the following criteria: GPA, math and verbal SAT scores, Achievement Test scores, honors courses and advanced placement courses.

Students entering UCSD from high school or another postsecondary institution must complete Section IX on the *University of California 1990-91 Undergraduate Application for Admission and Scholarships*, if they wish to apply for scholarships. The deadline for submission of the application is November 30, 1989. No supporting documents are required.

All continuing UCSD students who have a cumulative UC GPA of at least 3.50 at the end of spring quarter 1989 will be mailed a separate scholarship application from the Student Financial Services Office in December. Current students who are in their first quarter of UCSD attendance during fall quarter 1989 will be mailed a scholarship application if their prior GPA from high school is at least 3.8 or if their prior GPA from another postsecondary institution is at least 3.5. All other continuing UCSD students who wish to apply for scholarships, but do not receive an application in the mail, should obtain one from the Student Financial Services Office. Prior students not currently



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 GPA of entering students selected as Regents Scholars in 1989-90 ranged from approximately 4.00 to 4.83 with a mean of 4.27, while the combined SAT scores averaged 1400. Continuing students who were offered the Regents Scholarship averaged a 3.94 GPA. 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 grade-point average 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 their appointment. Additionally, in the initial year of appointment only, entering Regents Scholars will receive a second scholarship based on their academic achievement for a combined total equal to California resident UC registration fees (approximately \$1,734). Foreign students are eligible to apply for Regents Honorarium Scholarships. 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 established each year by the Student Financial Services Office and includes required fees and tuition, books and supplies, room and board, personal and transportation expenses. During 1989-90, the awards ranged from \$500 to \$15,465.

Regents and National Merit Scholars are eligible for certain privileges and recognitions such as: preferred early enrollment, guaranteed on-campus housing for four years (provided housing deadlines are met), UCSD college of choice at time of admission, appointment of a college honors adviser, graduate student library privileges, transcript annotation (Regents only), three times the amount of free computer time, honors seminar, a scholars identification card and an annual reception with the chancellor.

attending but planning to be readmitted to UCSD during 1990-91 should request an application from the Student Financial Services Office, if they wish to apply. The deadline for submission of the scholarship application and any required supporting documents is January 31, 1990.

Current UCSD Early Admissions Honors (EAH) students do not need to reapply. Your 1989-90 scholarship/admission application will be utilized for 1990-91 scholarship competition.

If you plan to file the *University of California 1990-91 Application* for winter or spring quarter 1991 admission and you wish to be considered for a UCSD scholarship, request a scholarship packet from the Student Financial Services Office in December. The deadline for submission of the scholarship application and required supporting documents is January 31, 1990.

The Ellen and Roger Revelle Scholarship

This prestigious scholarship recognizes two outstanding undergraduate students entering UCSD each fall. One recipient will be selected from the highest-achieving entering affirmative action students. The other recipient will be selected from among the highest-achieving non-affirmative action students. The scholars are chosen on the basis of academic excellence and exceptional promise. Each award grants a \$1,500 per year honorarium for up to four years.

University Scholarships

The regents of the University of California have 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 \$2,400 per academic year.

Transfer Admission Guarantee (TAG) Scholarship

Awarded to students transferring to UCSD through the TAG program from each one of the nine local community colleges in San Diego and Imperial Counties.

Alumni Scholarships

The UCSD Alumni Association provides scholarships to assist with the cost of attending UCSD. These awards are given on academic and personal achievement, and future promise. Alumni awards do not consider financial need.

Scholarships for National Merit Finalists

UCSD offers college-sponsored National Merit Scholarships to finalists who attend UCSD and whose National Merit awards are not funded by corporate donors. Annual stipends range from a \$500 honorarium to a \$2,000 need-based stipend. Additionally, in the initial year of appointment only, entering National Merit Scholars will receive a second scholarship based on their academic achievement for a total equal to California resident UC registration fees. Refer to the Regents Scholarship section for a listing of the UCSD privileges accorded National Merit winners.

Various Academic Achievement Scholarships

These scholarships are offered to: (a) students entering UCSD with a minimum GPA of 3.8 and SAT math and verbal scores of 650 each; (b) semifinalists in the National Achievement Scholarship Program for Outstanding Negro Students; (c) National Merit finalists; and (d) the top student affirmative action scholars. For the 1990-91 academic year, the recipients will receive scholarships (minus Regents awards) for the full cost of California UC registration fees.

President's Undergraduate Fellowship Program (PUF)

This program helps assist unusually talented undergraduate students to pursue special studies and projects, under faculty supervision, during term time and/or vacations. Projects may include research and/or other creative activities. Winners are awarded a need-based stipend.

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 and/or ecological values clarification. Research is conducted under faculty supervision during the academic year and/or vacation periods.

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 Consumer Handbook* 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 Student Aid Application for California (SAAC), all required copies of the 1989 federal income tax returns with a UCSD Income Tax Certification form, and any other required documents. For specific instructions, refer to the *Financial Aid Consumer Handbook*, which is available upon request. The SAAC form should be filed by March 2, 1990, 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 SAAC.

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.

PELL GRANT (APPLY USING THE SAAC)

Pell Grant is a federal aid program designed to provide financial assistance to undergraduates attending post-high-school educational institutions. 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. To apply for a Pell Grant, you must check the appropriate box on the SAAC in addition to requesting UCSD to be sent a copy of your SAAC.

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.

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, 1990, using the SAAC; failure to do so will significantly reduce a student's UCSD aid eligibility.

CALIFORNIA STATE GRADUATE FELLOWSHIP

California State Graduate Fellowships are awarded by the California Student Aid Commission to California residents entering their first or second year of graduate or professional study. Current recipients must reapply each year to have the award renewed. A SAAC must be filed by the preceding March 2.

WORK-STUDY

Federal and state work-study programs are employment programs that provide funds for student employment by the university or by public and private profit/nonprofit organizations. 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.

PERKINS LOANS (FORMERLY CALLED NATIONAL DIRECT STUDENT LOANS)

A student is eligible for a Perkins Loan if he or she demonstrates financial need. An undergraduate student may borrow up to \$4,000 during the first two academic years. The aggregate sum for all undergraduate studies may not exceed \$9,000. A graduate or professional student may borrow up to a \$18,000 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.

STAFFORD LOANS (FORMERLY GUARANTEED STUDENT LOANS)

These loans are available to students who demonstrate financial need. The annual maximum allowed during the first two years of undergraduate study is \$2,625, and \$4,000 per year for the remaining years of undergraduate study, with an undergraduate cumulative maximum of \$17,250. Graduate students may borrow up to \$7,500 per academic year with an aggregate sum of up to \$54,750, including the amount borrowed as an undergraduate. The interest rate for new borrowers is 8 percent through the in-school period and for the first four years of repayment, increasing to 10 percent at the start of the fifth year of repayment.

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 SAAC and have completed the UCSD financial aid application process.

SUPPLEMENTAL LOANS FOR STUDENTS AND LOANS FOR PARENTS

Independent undergraduates, graduate students, and parents of dependent undergraduates or dependent graduate 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 1989-90 the interest rate was set at 12 percent). Parents of dependent undergraduates or dependent graduate students are eligible to borrow up to \$4,000 per year (with a cumulative maximum of \$20,000) under this program. Independent undergraduates are eligible to borrow up to \$4,000 per year maximum (with a cumulative maximum of \$20,000). The first payment is due within sixty days of the date the loan is disbursed. In-school defer-

ments of principal and interest payments are available for students, and parent borrowers may also defer payments for unemployment, in-school status, and temporary disability. Deferred interest will be capitalized on a minimum quarterly basis. Applications and further information may be obtained from the Student Financial Services Office after July 1 for the following academic year.

EMERGENCY SHORT-TERM LOANS

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

FOOD SERVICES

Administration: Muir Commons Annex
Mail Code C-022
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, 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, the 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 food 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 who choose a board plan usually select one of the modified board plans plus cash 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 most 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., located in the Student Center; and the Ché Cafe located on Revelle campus. Also available for a limited selection of food stuffs are a variety of vending machines located in key traffic locations throughout all the campuses.

HOUSING

ON-CAMPUS HOUSING

Administration:
Building 206 Matthews Administrative and Academic Complex
Mail code Q-041
534-4010

SINGLE UNDERGRADUATE HOUSING

Revelle, John Muir, Third, 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. The limited 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 \$5,400 plus a \$75 deposit for the 1990-91 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 and Third 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 1990-91 was May 4, 1990 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 Food Services Administration Office, located in Building 206 Matthews Administrative and Academic Complex, 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 Coast, Mesa, and La Jolla Del Sol complexes.

MARRIED AND SINGLE GRADUATE HOUSING

Married students may reside in one- or two-bedroom apartments. Married students with children may choose between two- and three-bedroom apartments. Single graduate students have the choice of studio or two-bedroom apartments, although if a two-bedroom apartment is selected there must be at least one roommate who is also a graduate student. All apartments are unfurnished except for stoves, refrigerators, garbage disposals, and living room drapes. Mesa Apartments are carpeted, and Coast Apartments have sheet vinyl throughout. La Jolla Del Sol offers one- and two-bedroom luxury condo-type units with a full array of amenities in the facility. Coin-operated washers and dryers are available in the community buildings on the apartment grounds. Current rental rates for two-bedroom apartments range from \$425-\$925 per month and are subject to change with thirty days' prior notice. There is an extensive waiting list for the Mesa and Coast Apartments.

You may write, apply in person, or telephone the Residential Apartments Office, S-007, University of California, San Diego, La Jolla, California 92093 (619) 534-2952, for brochures and applications for Coast or Mesa apartments. For information on La Jolla Del Sol, call (619) 587-1221.

INTERNATIONAL CENTER

(Located at the corner of Hutchison Way and Gilman Drive)

Mail code Q-018
534-3730

Facility reservation: 534-6442

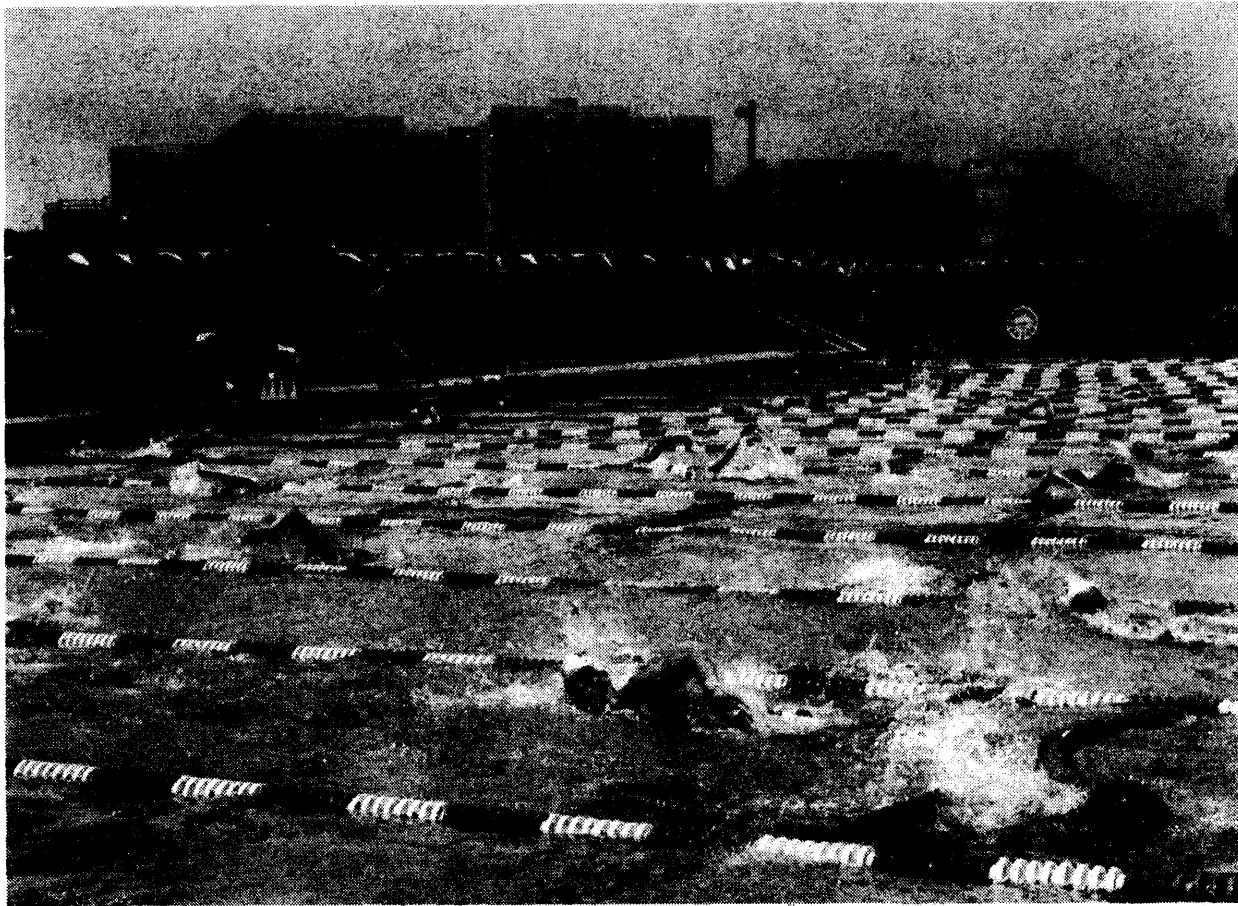
The International Center assists U.S. students going abroad as well as foreign students, scholars and families, and facilitates interaction among all internationally minded UCSD students, faculty, and staff.

Services to students going abroad include advising on a wide range of study, work, and travel opportunities through the UCSD Opportunities 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 B-004
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 students are offered. Time-limited focus groups include 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 S-005
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 Gymnasium
- 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.

EXTRAMURAL TEAM SPORTS

Extramural Teams (Sports 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.



CAMPUS SERVICES AND FACILITIES

Teams include cycling, lacrosse, sailing, surfing, rugby, snow ski racing, and ultimate disc.

RECREATION CLASSES

Recreation classes provide students and the university community an opportunity for non-credit, nongraded instruction in a range of physical and leisure activities. The program includes professional instruction in everything from 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, and other outdoor pursuits. The Outback Adventures director will also arrange customized trips. In addition, the program offers instructional workshops, a resource library of maps and park information, and a camping and outdoor equipment rental service which includes downhill and cross-country skiing equipment, camping equipment, and game equipment.

AQUATICS

UCSD Campus Recreation Aquatics encompasses a wide range of aquatic activities that may in part be offered in other areas of the Campus Recreation Program but are coordinated by this sub-unit. 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 stu-

dents 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.

OFFICE OF RELIGIOUS AFFAIRS

Building 502, Matthews Administrative and Academic Complex
Mail code Q-081
534-2521

See "Undergraduate Affairs/Special Services" later in this section.

UNIVERSITY CENTER(S)

Mail code Q-076
Administrative Offices: 534-4022
Facility Hours: 8:00 a.m.-11:00 p.m.

The two 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 existing Student Center are places for students to meet, dine, and relax. The centers provide services and activities not available elsewhere on campus. With a diverse assortment of services, organizations and activities, the centers are able to meet the demands and needs of the student population.

THE PRICE CENTER

Located in the center of campus just south of Central Library, the Price Center houses a variety of services. With seven restaurants, a movie theatre, computer lab, post office, automatic banking, travel service, box office, art gallery and photo lab, the center's aim is to meet the needs of UCSD's diverse community. Also, the Price Center has available for reservation fourteen meeting rooms, including a grand ballroom. Comfortable lounge areas 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. The administrative offices of the University Center as well as University Events/Student Activities and the Associated Students offices are also housed in the center, along with the Women's Resource Center and Alumni Association Office. In addition, the Price Center is the new home of the University Bookstore.

THE STUDENT CENTER

Mail code B-023C

The Student Center, located east of the Recreation Gym, continues to offer services operated by students. The student-run co-ops and enterprises housed in the Student Center include the General Store, the Bike Shop, the Food Co-op, Soft Reserves/Lectures Notes, Groundwork Books, the Computer Co-op, the Student Credit Union, and KSDT Radio. The Crafts Center and Grove Gallery, located next door to the Student Center, offer a variety of instruction to students, faculty, and staff. The Grove Caffe, housed within the Crafts Center, serves specialty coffees, pastries, and sandwiches. The campus media and student organization offices are also located in the Student Center. The Ché Cafe restaurant, a part of the Student Center complex (located on Reville campus), offers a vegetarian menu at affordable prices.

STUDENT INFORMATION CENTER (EDNA)

Mail code Q-076

534-3362

Hours:

Mon.-Fri., 8:00 a.m.-11:00 p.m.

Sat. and Sun., 10:00 a.m.-8:00 p.m.

Summer and Vacation, 8:00 a.m.-4:30 p.m.

Located in the Price Center's Plaza, the information desk serves the campus community as well as the surrounding community, disseminating information and providing a variety of services benefitting the students, faculty, staff, and the general public.

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

STUDENT GOVERNMENT/STUDENT ORGANIZATION SUPPORT SERVICES

Third Floor, Price Center

Mail code Q-077

Organizations: 534-4083

Associated Students: 534-4450

Business Office: 534-4399

Hours: 8:00 a.m.-4:30 p.m. Monday-Friday

There are over 200 student organizations on campus offering students the opportunity to become involved in academic, cultural, social, political, and religious activities, as well as student run medias. In addition, the Associated Students Government provides students with practical experience in dealing with programming, financial, and political issues. The

A.S. also operates the Grove Caffe, Lecture Notes, Soft Reverses, Assorted Vinyl, Volunteer Connection, ASIO, and U.S. Grants. The Student Government/Student Organization Support Services staff works with the A.S. and organizations in developing and implementing programs and activities which are designed to meet the students' needs. The Student Government/Student Organizations Support Services Office works with student organizations and the A.S. in managing activity fee funds, providing financial advice, and assisting in areas of fund raising and programming.

STUDENT HEALTH SERVICE

Mail code Q-039

534-3300

Comprehensive primary health care is provided without charge during the academic year for all university registration fee-paying students at the Student Health Service. 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 through Friday.

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

Entering students are requested to complete and return a Medical 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 ex-



penses 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 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 and professional 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 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.

UNDERGRADUATE AFFAIRS/ SPECIAL SERVICES CENTER

Building B, Student Center
Mail code B-009

The Undergraduate Affairs/ Special Services Center (UA/SSC) comprises the following units: Commuter Student Services, Student Legal Services, Disabled Student Services, Office of Religious Affairs, Student Affirmative Action, Student Safety Awareness, and the Office of Student Judicial Affairs, including student conduct and discipline as well as grievance procedures under Titles VI and IX, Section 504 of the Rehabilitation Act of 1973, and Right to Privacy as it affects students.

The goals of the UA/SSC are to ensure effective delivery of services to our student population, and to assure fair, consistent, and equitable administration of student conduct and student affirmative action procedures and requirements. All of the programs under the UA/SSC are housed in Building B of the Student Center with the exception of Disabled Student Services which is located in Building 204

Matthews Administrative and Academic Complex.

JUDICIAL AFFAIRS

534-6225

Judicial Affairs 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 Undergraduate Affairs units including the vice chancellor, Undergraduate Affairs and the college and resident deans.

STUDENT AFFIRMATIVE ACTION

534-6708/2573

The responsibility of this unit is to initiate and implement an active and intensive Student Affirmative Action Program for the recruitment, retention, and academic achievement of undergraduate students from the affirmative action population.

At present, Student Affirmative Action is composed of the following programs:

Student Affirmative Action Committee (SAAC)

SAA Internship Program

SAA Programming

Oversight and Update UCSD Five-Year SAA Plan

The Student Affirmative Action Committee comprises six affirmative action organizations: Asian/Pacific Students Alliance, Black Students Union, Disabled Students Union, MEChA, Native American Students Alliance, and the Women's Resource Center. Each student affirmative action organization elects one representative and alternate to participate on the Student Affirmative Action Committee. These elected representatives serve a minimum of one academic year as voting members of SAAC.

The SAA Internship Program is the vehicle by which SAAC is able to review and evaluate the Undergraduate Affairs programs and units to assure responsiveness to student affirmative action. SAA interns also provide the factual and evaluative basis for appropriate recommendations from SAAC to the vice chancellor for Undergraduate Affairs. The internship pro-

gram started in 1976 and since its inception, SAAC has had student interns performing research and evaluation of assigned Undergraduate Affairs units. Upon completion of the assignment, the interns are required to submit to SAAC a written evaluation report with recommendations to the vice chancellor for Undergraduate 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 LEGAL SERVICES

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 MEDIATION SERVICES

534-4443

Student Mediation Services assists students in settling their own disputes with other students in a non-adversarial manner. Common types of problems facilitated by Student Mediation Services include community living disputes, interpersonal problems, property damage and small debt disputes. The services are free, voluntary, and confidential. The program is located in Student Legal Services, Building B of the Student Center.

STUDENT SAFETY AWARENESS PROGRAM

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 assistance by speaking with the information officer at the above number.

COMMUTER STUDENT SERVICES OFFICE

534-3670

The major thrust 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:

- \$250-\$425—for furnished room with kitchen privileges
- \$225-\$450—for own room in a home with other students (roommate)
- \$400-\$600—for studio or bachelor apartment
- \$450-\$725—for one-bedroom apartment or house
- \$625-\$1,000—for two-bedroom apartment, condo, or house
- \$900-\$1,300—for three-bedroom apartment, condo, or house
- \$1450-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 newspapers, rental publications, free rental agency contacts, landlord/tenant handouts, and two courtesy telephones. Additionally, for students seeking a roommate, there is now available a "ROOMMATE HOTLINE." The hotline is a recording of the roommate listings received that particular day. The recording is available after 4:30 p.m. Monday through Friday, and anytime on weekends. Call (619) 534-3670.

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.

RELIGIOUS AFFAIRS

Building 502 Matthews Administrative and Academic Complex
Mail code Q-081
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.

DISABLED STUDENT SERVICES

Building 204 Matthews Administrative and Academic Complex
Mail code Q-019
534-4382/534-2494 (TDD*)
(Telephone for the deaf ONLY)

The primary objective of the Office of Disabled Student Services 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, Print Enlargers, Telecommunication phone devices for the deaf, Phonic Ears, and other supportive special equipment for students with disabilities are available at Disabled Student Services.
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. Prior notification by regular users of the transportation system is required by Thursday at 12:00 noon in order to change their schedules for the following Monday through Friday. New users of the transportation system can schedule their transportation needs for the current sign-up week. 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.
6. Special Parking Coordination
7. Special On-Campus Housing Coordination
8. Registration/Enrollment Assistance
9. Test-Taking Arrangements
10. Resource Library
11. Liaison with the California State Department of Rehabilitation
12. Referrals to Resources, Services, and Agencies
13. Campus Accessibility Map





Documentation of disability will be required for the delivery of most services for disabled students.

UNIVERSITY EVENTS AND STUDENT ACTIVITIES OFFICE

Price Center
Mail code Q-078
534-4090

The University Events and Student Activities Office is a central resource for programming of events and activities at UCSD. The office is responsible for a number of programs and services. 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, technical set-up, 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.

The office is responsible for assisting in the development of student organizations and administers the Leadership Training Program for student leaders. Students wanting to get involved in campus activities should come to the University Events and Student Activities Office in the Price Center, where the staff will happily assist you in finding those activities of special interest to you. Make the most of your college experience—get involved!

Registration for student organizations begins in fall and continues throughout the academic year. There are more than 200 registered student organizations, including fifteen national fraternities and eight national sororities. Students who are interested in forming or joining an organization should contact this office for registration forms, financial and program advice. The University Events and Student Activities staff offers you the opportunity to get involved with dynamic and active student organizations.

VETERANS' AFFAIRS

Building 210 Matthews Administrative and Academic Complex
Mail code Q-013
534-4483

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. In addition to federal veterans' educational benefits, this office can assist you in attaining California benefits if you meet the requirements listed in 1 above and if the veteran was a resident of California.

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 FACILITIES

UCSD ALUMNI ASSOCIATION

Price Center
Mail code Q-083
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 in this nonprofit membership organization enable the association to provide student scholarships, honor distinguished alumni, provide career services and programs, develop regional clubs, and participate in legislation affecting higher education.

The association is governed by a board of volunteer alumni directors 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 *Perspectives*, use of UC vacation centers throughout California, discount cards, and

participation in special health and travel programs.

ART GALLERIES

MANDEVILLE ART GALLERY

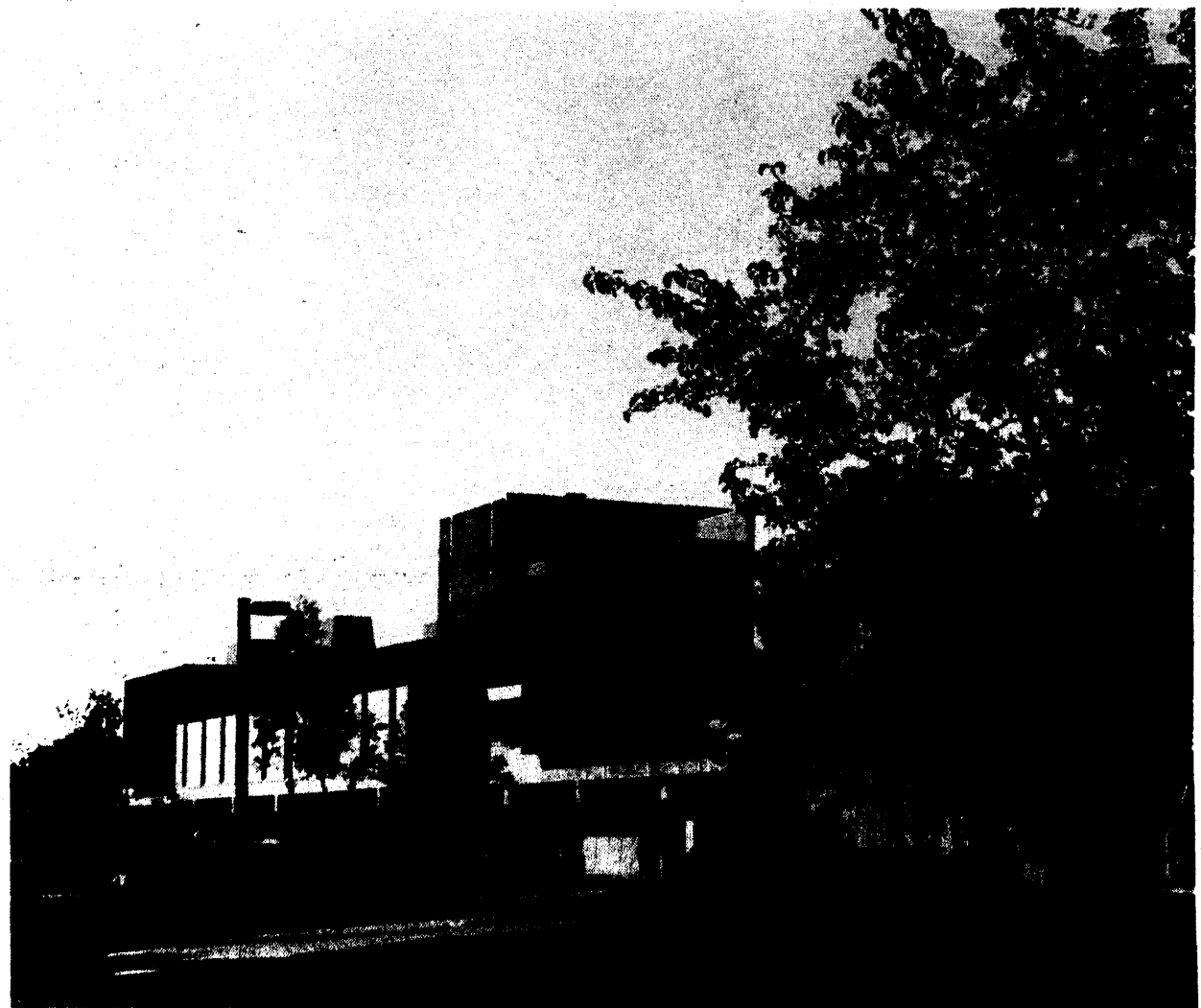
Mandeville Center, Room 101
Mail code B-027
534-2864

Mandeville Art Gallery exhibitions cover a wide range of fields, with an emphasis on changing exhibitions of contemporary works. Last year's exhibitions included: *Richard Bosman: Gifts of the Sea; Chile from Within and Arpilleras: Chilean Murals of Today; Komar and Melamid: Recent Work; James Trivers: Double Feature; Annual VIII: Small-Scale Sculpture; Spatial Encounters* (an installation exhibition); and an architecture exhibition.

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 B-027
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.

CRAFTS CENTER

Mail code B-038
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 Q-031
534-2768

The UCSD Day Care 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.

PARKING AND TRANSPORTATION SERVICES ON CAMPUS

Building 400 Matthews Administrative and Academic Complex
Mail code Q-040
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.

Parking permits are available at the Central Cashier, Building 401 Matthews Administrative and Academic Complex. Student "S" permits must be paid in advance from date of purchase through June 30. 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

Building 510 Matthews Administrative and Academic Complex
Mail code Q-031
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 \$.04 a page.



The copier machine located in Graphics and Reproduction Services, Building 510 Matthews Administrative and Academic Complex, 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.

STUDENT MAIL SERVICES

Building 510 Matthews Administrative and Academic Complex
Mail code Q-047
534-7098

The Student Mail Services provides Monday through Friday distribution of mail to resident students during the academic year. Hours of operation are 8:00 a.m. to 4:30 p.m.

UNIVERSITY BOOKSTORE

Price Center
Mail code Q-008
534-READ

In addition to required textbooks and reading materials, the University 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 7:30 a.m. to 6:00 p.m. Monday through Friday, Saturday 9:30 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 Q-008
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 11:00 p.m. Monday through Friday; Saturday 9:30 a.m. to 11:00 p.m.; Sunday 9:30 a.m. to 7:00 p.m.

REVELLE SUNDRY STORE

Blake Hall, Revelle campus
Mail code B-011
534-2035

The Revelle Sundry Store offers snacks, gifts and greeting cards, school supplies, and film and film processing. Hours are 7:45 a.m. to 9:00 p.m. Monday through Thursday; Friday 7:45 a.m. to 5:00 p.m.; Saturday 10:00 a.m. to 2:00 p.m.

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 Matthews Administrative and Academic Complex, (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 \$25 for a \$.25 charge at the University Bookstore (Hours: Monday through Friday 7:30 a.m. to 6:00 p.m. and Saturday, 9:30 a.m. to 5:00 p.m.) and the Revelle Sundry Store (Hours: Monday through Thursday 7:45 a.m. to 9:00 p.m., Friday 7:45 a.m. to 5:00 p.m., Saturday 10:00 a.m. to 2:00 p.m.).

UNIVERSITY POLICE DEPARTMENT

Building 500 Matthews Administrative and Academic Complex
Mail code Q-017
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.

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 5:00 p.m. to 1:00 a.m.

BICYCLE AND SKATEBOARD PROGRAM

534-4358

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

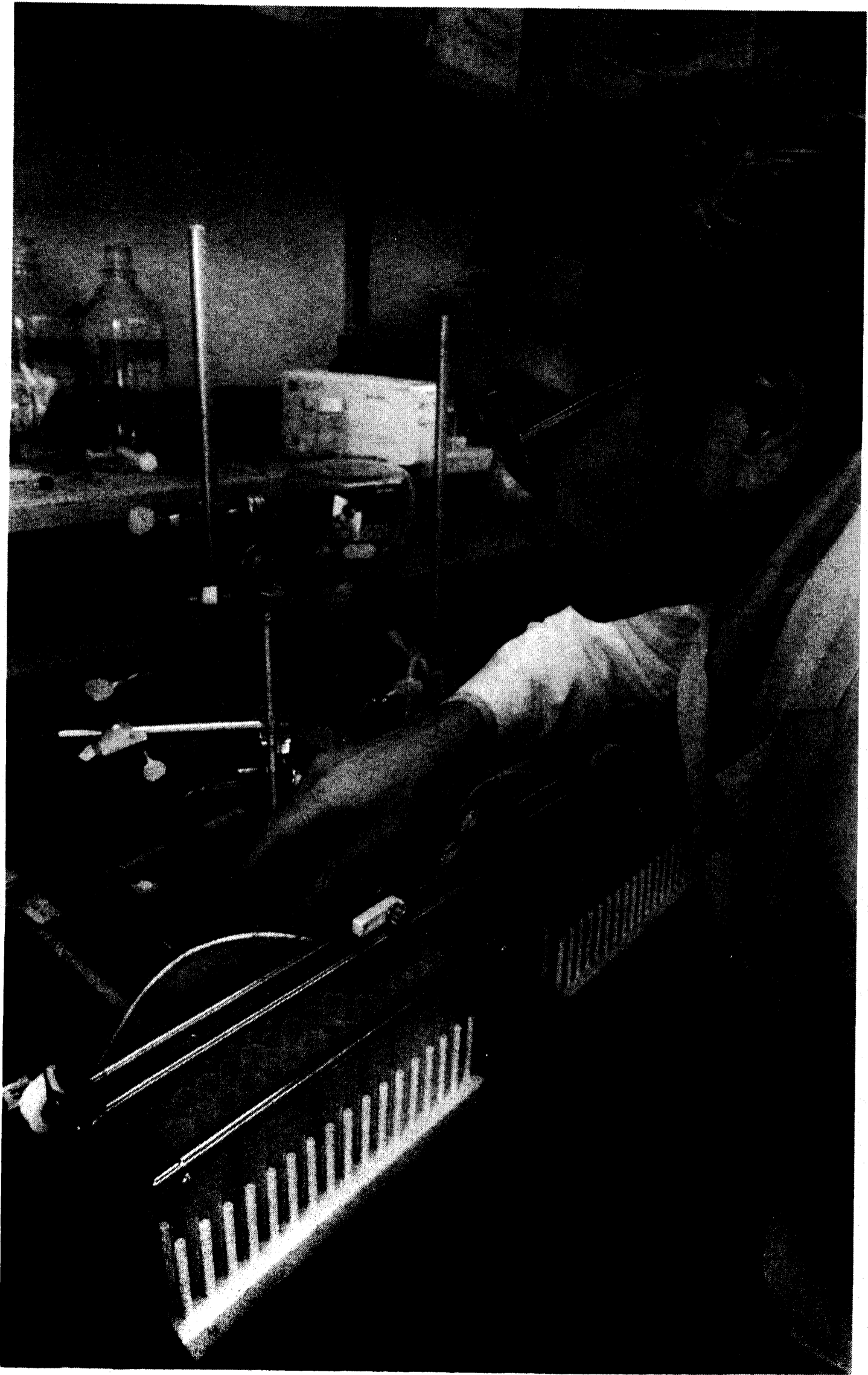
534-4361

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 B-024
534-2052

The Price Center Post Office is a contract station operated under the rules and regulations of the U.S. Postal Service. Stamps, money orders, and other postal items may be purchased and mailed at this location Monday-Friday, 8:30 a.m. to 4:30 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 11:45 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 presently in operation at UCSD are described below.

In addition, the university is formally and informally affiliated with various private research organizations such as the Center for Study of Nonlinear Dynamics of the La Jolla Institute, 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) was established in 1979 as a statewide organized research unit of the University of California. It conducts and supports space research, both pure and applied, with special emphasis on the opportunities created by space science and technology in the applied field. Specific areas of investigation include the following:

Remote sensing—the acquisition and processing of data on natural resources and the environment gathered by satellites or other automated devices with remote sensing instruments. Programs explore applications in oceanography, coastal studies, agriculture, forestry, and atmospheric pollution.

Climate—atmospheric physics and oceanography as applied to long- and medium-range weather and climate prediction, especially those aspects which utilize remote sensing data. Cal Space takes part with the Climate Group of ORD in the Climate and Remote Sensing (CARS) research group.

Space resources and human needs—advanced technologies which can improve access to space. These include automation and robotics, innovative modes of propulsion, and use of extraterrestrial materials. Development

of possible practical uses of special conditions in space of zero or controlled gravity, unlimited and uninterrupted solar heat, and vacuum.

Minigrant program—Cal Space supports a program of small grants to investigators on all UC campuses in space-related research, including the fields described above, astrophysics, and space science.

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 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 by acoustic tomography; of the structure of the oceanic crust and lithosphere by seismic and electromagnetic measurements on the ocean bottom and at the ocean's surface through seismic multichannel methods; and of tides, waves, turbulence, and circulation in the oceans. The institute operates a global network of twenty-five broadband seismometers, the IDA (International Deployment of Accelerometers) Array, with five 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 IGCC is to study the causes of international conflict and the modes of its attenuation. During its first five years, the research program of the institute focused largely on the issue of nuclear war avoidance through arms control and confidence-building measures between the superpowers. Reflecting ongoing changes in the international system, the research portfolio is now diversifying to include the international security consequences of such "common enemy" problems as global ecological changes and international economic imbalances, as well as a concern for the role of norms and institutions in future global governance. IGCC also supports instructional programs in peace and security studies throughout the UC system, at the undergraduate level, through doctoral dissertation fellowships, and by means of summer seminars for high school and college-level teachers. The institute is supported financially by the Regents of the University of California, and it has been awarded grants by such foundations as Ford, MacArthur, Rockefeller, Sloan, the Carnegie Corporation, and the United States Institute of Peace.

Institute of Marine Resources (IMR), established in 1954, is a university-wide organization with its headquarters and principal operating units at the UCSD Scripps Institution of Oceanography. An executive committee provides representation from each of the university's general campuses. The institute's mission is to enhance understanding of the marine environment and human interactions with it by supporting research programs and stimulating interchange among the university's campuses. As part of its intercampus activities IMR conducts workshops on specialized topics and provides support for graduate students in ocean-oriented fields to study temporarily on a campus other than their home campus.

A major function of the institute is the administration of the California Sea Grant College Program. This program supports the work of over fifty investigators on various campuses of the university and other academic institutions throughout the state, including traineeships for graduate students carrying out projects in all aspects of marine and coastal research.

Further information about the IMR inter-campus study program and Sea Grant traineeships can be obtained from the IMR director's office.

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 Neural Computation** (approval pending) 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 project is multidisciplinary with founding members coming from both biological and social sciences as well as engineering.

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, fac-

ulty 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 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.

The INLS at UCSD maintains close ties with similar activities at five other UC campuses and the Los Alamos National Laboratory. INLS supports exchanges of faculty and students among these campuses and the laboratory. In addition, the INLS participates in organizing a UC-wide annual conference and summer school in nonlinear science, as well as frequent intercampus workshops on various disciplinary topics in nonlinear dynamics. Student and faculty attendance at these events is supported by the INLS here at UCSD and the Office of the President of the university.

Institute for Pure and Applied Physical Sciences (IPAPS) is an interdisciplinary research unit which brings together members of the Departments of Applied Mechanics and Engineering Sciences, Physics, and Scripps Institution of Oceanography. The institute is concerned with hydrodynamics, molecular and solid-state physics, theory of fluids, catalysis, and numerical methods. Specific subjects of research include superconductivity, ferromagnetism, ferroelectricity, phase stability and melting points, plasma physics, hydromagnetics, high temperature gas dynamics, turbulence, fluid mechanics, nuclear structure and

reactions, laser physics, atomic and molecular structure and reactions, and numerical analysis.

Institute for Research on Aging (IRA) 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)** is a National Cancer Institute-designated Clinical and Research Cancer Center, active since 1978 with the dual mission of enhancing basic and applied research focused on the broad area of neoplastic disease and also promoting the best available care for patients with cancer. Under the auspices of a Cancer Center Core Support Grant from the National Cancer Institute, there are six active program areas within the Cancer Center. These include biostatistics; cancer biology; pharmacology; basic and clinical immunology; cancer treatment, clinical trials research and education; and cancer prevention, epidemiology and control. Shared resources at the Cancer Center include pharmacology, molecular biology and immunohistology core laboratories, a flow cytometry unit, a tissue bank and hybridoma production facility, a biostatistics unit, and a clinical trials office. Research and educational grants support the training of postdoctoral fellows and medical students. The Clinical Trials Office coordinates clinical research trials involving cancer patients at UCSD, and is the focal point for a large Cancer Protocol Outreach Network which provides state-of-the-art protocol treatment opportunities for patients in a broad geographic area around 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 in Hillcrest. Basic research activities of the Cancer Center are carried out both at the Theodore Gildred Cancer Facility and at the 303 Matthews Administrative and Academic Complex building on the La Jolla campus. Members and associate members of the Cancer Center number in excess of 150 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 \$8.5 million a year.

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 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.

CASS has about fifteen faculty associates, eighteen Ph.D. research staff, and about forty support personnel. The total yearly budget is about \$7 million, mostly from federal funding sources.

The **Center for Energy and Combustion Research (CECR)**, in 1986, replaced and encompassed the **Energy Center**, which was

formed in 1972-73 with initiation of graduate research programs and graduate and undergraduate courses on energy production, utilization, conservation, environmental impacts, and policy. Current research directions include energy research as well as combustion science and evaluations of environmental impacts associated with fossil-fuel utilization. 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 chairperson 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, detection 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.

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, films, and performances. It awards fellowships each year to the most promising 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 including the Cancer Center and the Institute for Research on Aging.

Center for Music Experiment (CME), formed in 1971-72, is dedicated to the basic research in sound, music, and related areas. Funding has been provided by the Rockefeller Foundation, the National Endowment for the Arts, the System Development Foundation, Fund for the Improvement of Post-Secondary Education (FIPSE), and other private and public funding agencies.

The *Computer Audio Research Laboratory* (CARL) project supports research, production, and education in the application of computers to contemporary art music, including creation of computer-based instruments for music composition, performance and theory, application of such instruments to the identification of new knowledge about music, the creation of music itself, and the education of graduate music students.

Colloquia and periodic research seminars draw upon the expertise of UCSD faculty and distinguished visitors and scholars in this permanent forum of study which addresses the relationships among the diverse artistic disciplines, art and technology, and the arts and humanities.

The CME Archive has two functions: recording and archiving the activities and products of the center, and providing public access to these materials through the Central University Library and through the publication of scholarly papers and an annual report.

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 VAX 11/750 digital computer, a number of SUN/3 and SUN/4 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 (US-MEX)**, established in 1979, is the nation's largest university-based 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, publications, and public education activities that address the full range of problems affecting economic and political relations between Mexico and the United States. The center also studies the history, economy, 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, journalists, and other nonacademic specialists, who spend three to nine 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, and the Far East. The center's permanent academic staff also conducts research, including a long-term program of field research on Mexican immigrants in the United States and studies of Mexico's economic relations with Japan.

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. In collaboration with El Colegio de Mexico and El Colegio de la Frontera Norte, the center also publishes biannually a comprehensive, interdisciplinary inventory of Mexico-related research being conducted at hundreds of sites around the world. The center also publishes much of the research conducted under its own auspices.

The center has a very active public education program, which includes frequent briefing sessions for journalists, business executives, public officials, and other nonacademic groups; a summer training program in U.S. studies for Latin American social scientists and nonacademic professionals; and presentations to 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 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; 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 five departments, 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 January 1990, APIP co-organized the second in a series of national affairs symposia at UCSD. Modeled after the highly successful "Chief of Staff" conference held at the university in 1986, which resulted in a University of California Press book and a national public television special, this most recent symposium titled "The Presidency, the Press and the People," focused on the emerging role of public relations in presidential leadership. All of the former presidential press secretaries, various White House communications aides, representatives of the national press corps, and scholars of the presidency assembled at UCSD for this unique two-day conference.

In the summer of 1989, APIP collaborated with UCSD's Center for U.S.-Mexican Studies in organizing a six-week summer seminar on

American politics, history, and economics for a select group of twenty-five Latin American scholars and nonacademic professionals. In addition to substantive morning seminars in which the participants were exposed to current research on a wide range of policy issues, the students were trained in afternoon workshops in survey analysis, computer-based statistical research, and microeconomic analysis of organizations. The Ford Foundation-sponsored seminar has been extended through 1991.

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. To facilitate interactions among faculty from six or more departments and two or three geographic locations, a newsletter concerned with funding in AIDS and a seminar series have been developed. 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 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, 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 between mathematicians and physicists.

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-XMP supercomputer, which is hardlined 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 rehabilitation and NSF on post-tensioned concrete girders are already in progress.

The **Water Research Project (WRP)**, established in 1988, exists to promote research in basic scientific and technological fields related to water as a natural resource, and to facilitate and develop the transfer of research ideas and results to the realm of technology and practical applications. Water research is a vast area encompassing many disciplines. The main effort at present is concentrated in three thrust areas where UCSD has particular research strengths. These are: (1) *Fluid mechanics*, including aspects of coastal oceanography and applications in chemical, mechanical and civil engineering science; (2) *Chemistry*, including aspects of geochemistry, in particular the physical chemistry of water and aqueous solutions and water/solid interaction processes; (3) *Biology*, including biotechnology applications involving genetic engineering and the dynamics of natural and artificial ecosystems. Some thirty faculty and researchers participate in the project, includ-

ing investigators from systems science, economics, and the health sciences.

NATURAL RESERVE SYSTEM (NRS)

The **Natural Reserve System (NRS)** was founded to establish and maintain a system of natural undisturbed land and water areas as samples of the diversity of California's terrain. These reserves are used to promote teaching and research in the environmental sciences. Faculty and students of the University of California and other institutions are encouraged to use any of the twenty-six reserves in the system for serious academic pursuits. Further inquiries can be directed to Dr. Paul Dayton, chairman of the UCSD NRS advisory committee, or to Ms. Isabelle Kay, academic coordinator, 534-2077. The San Diego campus administers the following four reserves:

Dawson Los Monos Canyon Reserve:

This 144-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 California Riparian Woodland, Diegan Coastal Sage Scrub, 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 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 clifftop (or "knoll") portions. The shoreline part surrounds and extends north of the Scripps Pier. Habitats include sandy beach and submerged plain,

seasonally exposed cobble beach, rocky reef, pier pilings, and upper submarine canyon ledges. Habitats of the clifftop knoll and canyons include coastal sage and desertic maritime scrubs, sea bluff succulent scrub, and disturbed grassland. Scientific use of the sixty-seven acres offshore has been granted to the university by the state legislature providing opportunities for marine studies as well as terrestrial studies on the bluffs and beach. 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

INSTRUCTIONAL COMPUTING CENTER

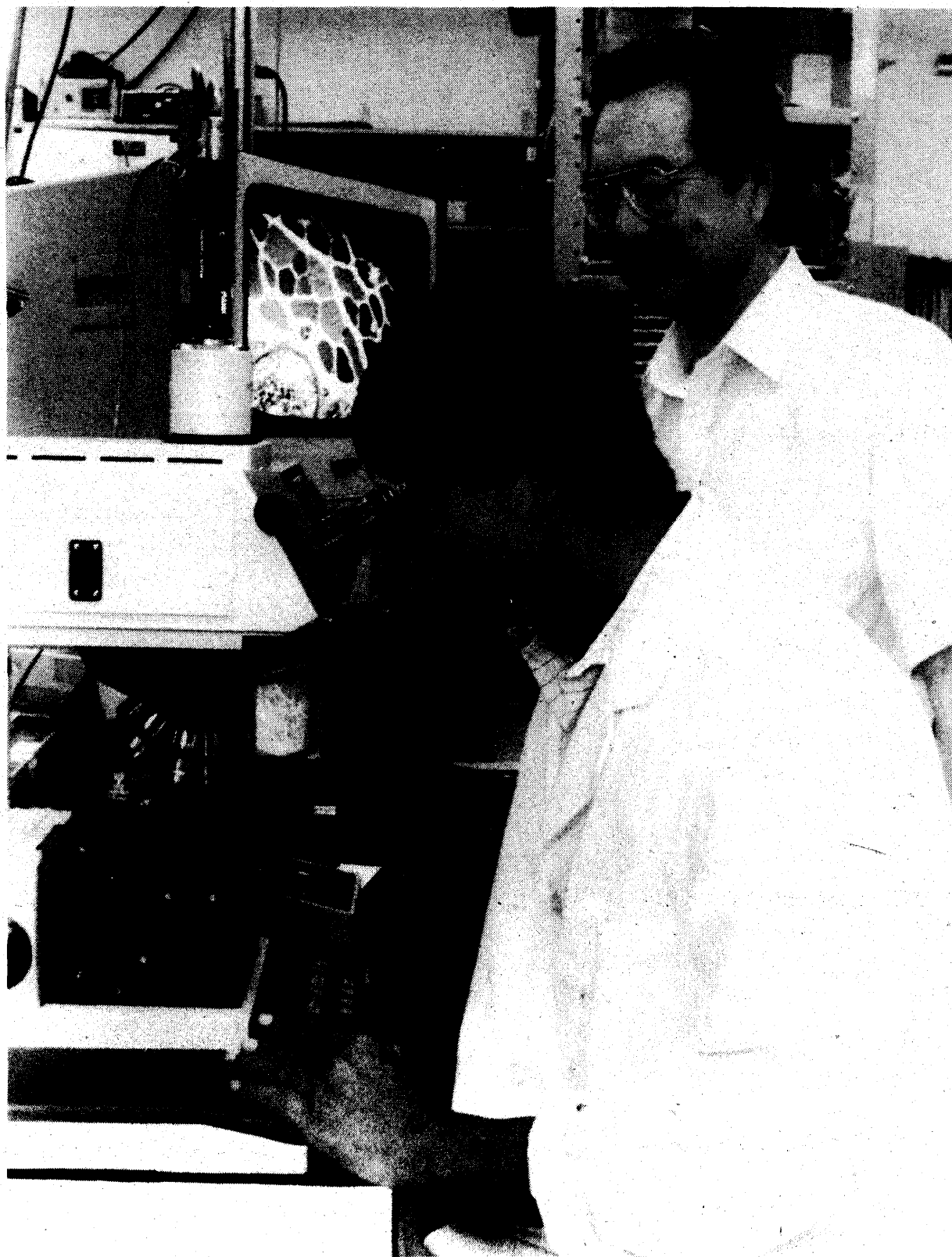
See page 95.

SAN DIEGO SUPERCOMPUTER CENTER

See page 97.

THE UNIVERSITY LIBRARY

See page 100.



THE SCHOOL OF MEDICINE

The School of Medicine's unique interdisciplinary approach to medical education enables students to benefit from a diversity of laboratory facilities, clinical opportunities, and faculty talent and knowledge. The founders of the School of Medicine and the UCSD general campus stressed a close interdisciplinary cooperation between and within the units; thus teaching and research are well integrated on this campus. The medical school faculty includes scientists from the campus Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry, Mathematics, Sociology, and the Scripps Institution of Oceanography. The medical school curriculum is broadened by the contributions of these faculty members on interdisciplinary course committees, emphasizing the facets of their disciplines which closely relate to medical education. Another feature of the School of Medicine's curriculum is its emphasis on the human being as an inextricable part of the social milieu. All instruction in medicine and related sciences considers humans not merely as physical organisms, but as persons who exist in a complex physical, social, and psychological environment.

The settings for clinical instruction and experience comprise a variety of hospitals and clinics ranging from rural, outlying facilities and county urban centers to the UCSD Medical Center. These affiliated hospitals and clinics include the UCSD Medical Center with 447 beds and a variety of outpatient clinics; the 606-bed Veterans Administration Medical Center adjacent to the La Jolla campus; the 583-bed Naval Hospital, which is the largest military medical complex in the United States, and eight other affiliated medical facilities. Major instructional and research buildings are located on the campus health sciences complex and at the UCSD Medical Center.

The goal of the medical 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 specialized areas of interest

for eventual development into careers in the broadly diversified medical community. All students have access to the best facilities and personalized counseling. The curriculum provides flexibility; form and content, in part, are adapted to the individual needs and goals of each student.

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 includes those aspects of medical education deemed essential for every medical student regardless of background or ultimate career direction. The integrated 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 describe it in writing. Students are graded on an Honors/Pass/Fail system for required courses. The Honors grade is not used to numerically rank the class, but is used to acknowledge students who have demonstrated superior academic performance. Elective courses are graded on a Pass/Fail system. Students receive written individual evaluations by the faculty.

The School of Medicine enrolled its charter class of undergraduate medical students in September 1968. Freshman student enrollment is now 122 and a total of 529 medical students were enrolled in 1989-90.

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 GPA values and MCAT scores above average. 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.

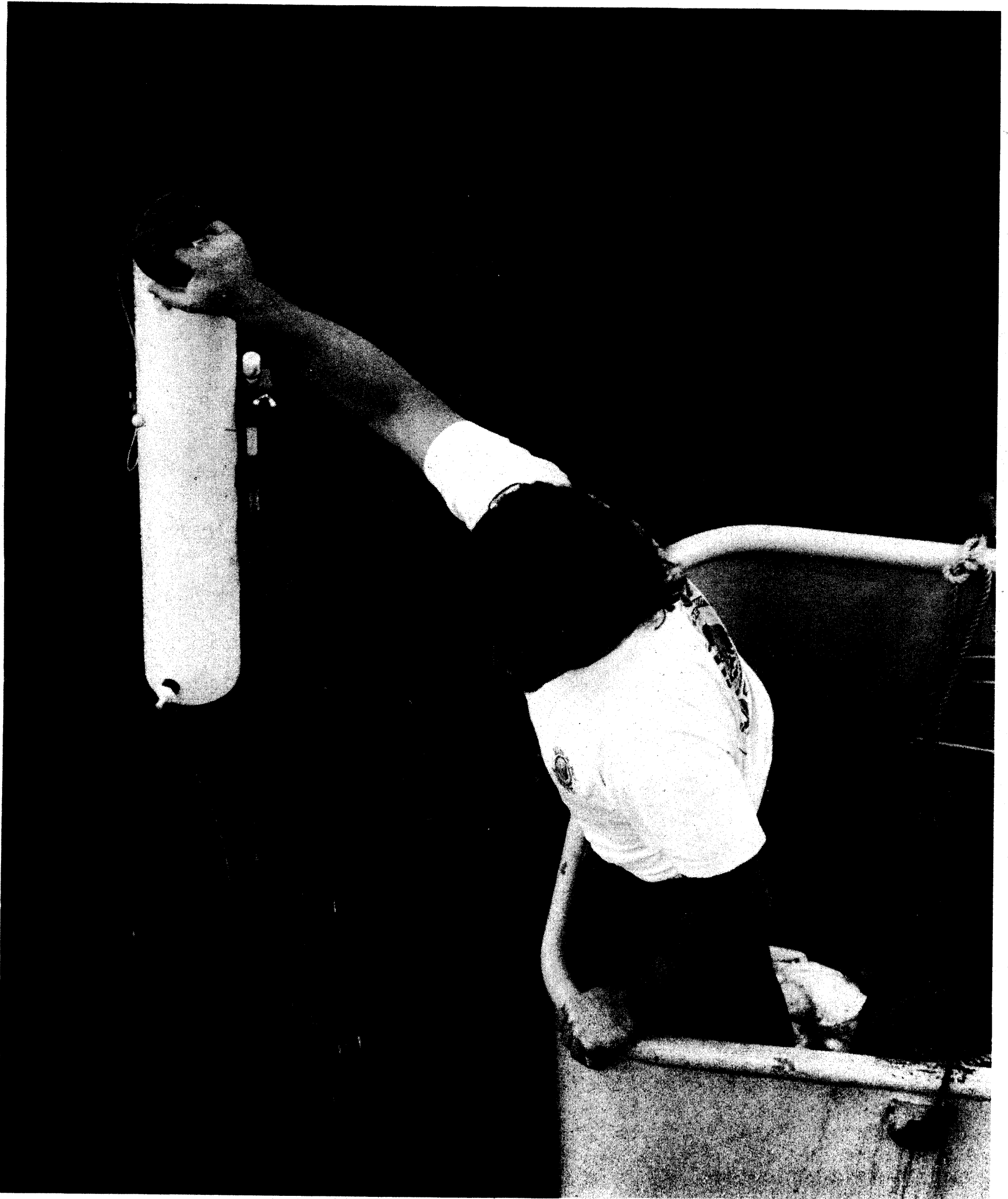
A complete catalog and information on the foregoing programs are available upon request.

Write or call:

The Office of Admissions
School of Medicine, M-021
University of California, San Diego
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-five buildings on 230 acres 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 \$65 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 250 programs that may be under way at any one time are studies of air-sea interaction, climate prediction, earthquakes, the physiology of marine animals, marine chemistry, beach erosion, the marine food chain, the ecology of marine organisms, the geological history of the ocean basins, and the multidisciplinary aspects of global change and the environment.

Scripps operates four ships and 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 Physiological Research Laboratory. 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, 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 Scripps 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 which 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. A new aquarium-museum is scheduled to open in 1991.

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 several specialized research units, including the Food Chain Research Group. 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, which not only gives them an early involvement with research, but also provides salaries. The student-faculty ratio at Scripps is about two-to-one, which means classes are small, and the student has the opportunity to work closely with his or her thesis adviser. Oceanography is an interdisciplinary field, which 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 the Scripps Supercomputer Users Remote Facility, which provides

SCRIPPS INSTITUTION OF OCEANOGRAPHY

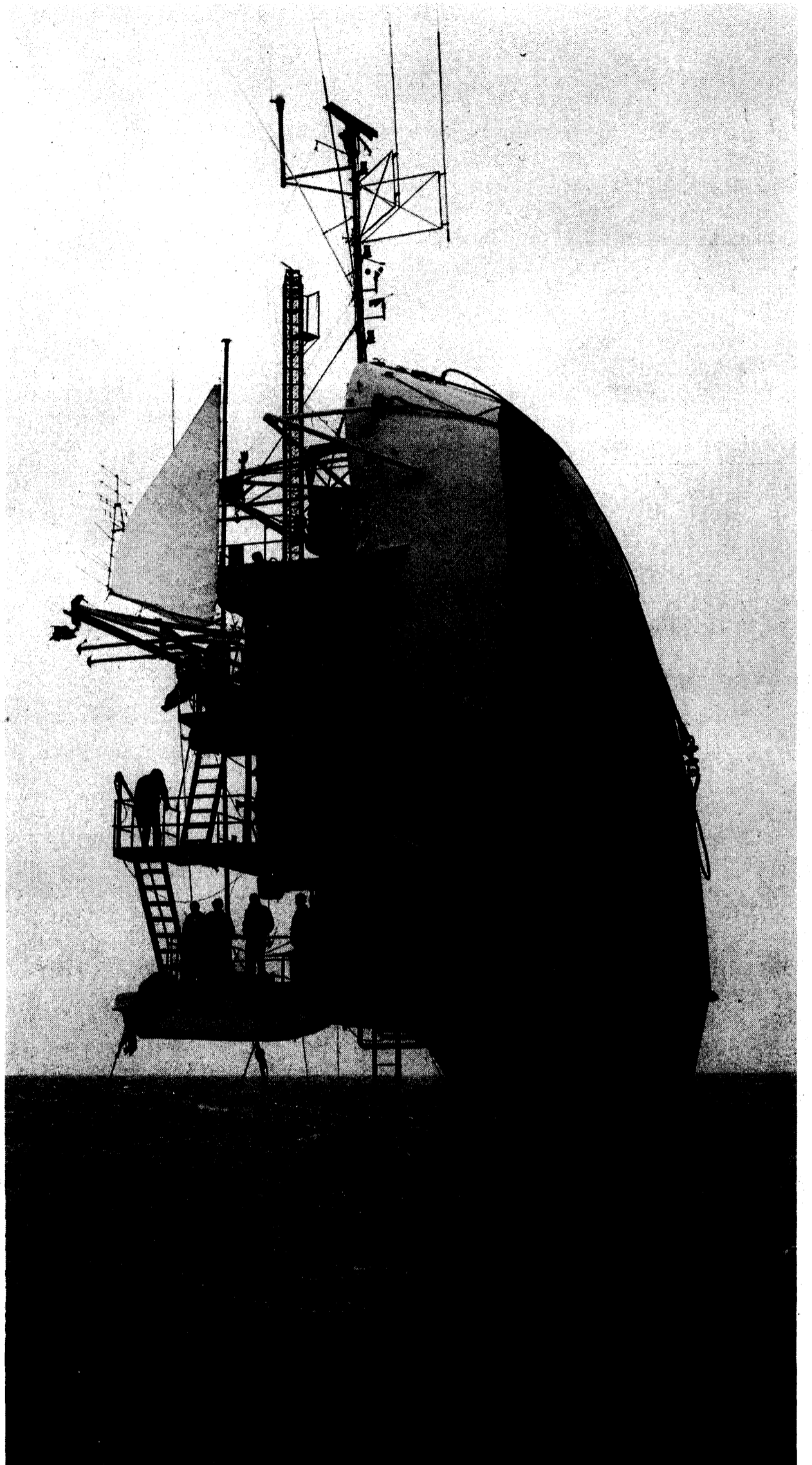
access to the San Diego Supercomputer Center through a high-speed link. The Scripps Library is the University of California's major collection of marine science materials, with outstanding collections in oceanography, marine biology, and marine technology. It also specializes in atmospheric sciences, fisheries, geology, geophysics, and zoology. The various marine life and geological specimens housed at Scripps form a vast "library" of oceanographic resources available for investigations. Two underwater research areas that are part of the UC Natural Reserve System are adjacent to the Scripps campus. During a student's tenure at Scripps, he or she will have the opportunity to go to sea on any of Scripps's four research vessels, as well as those from other oceanographic institutions.

The combination of 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
Mail Code A-008
University of California, San Diego
La Jolla, California 92093-0208

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GRADUATE SCHOOL OF INTERNATIONAL RELATIONS AND PACIFIC STUDIES

Created by the Board of Regents in 1986, the Graduate School of International Relations and Pacific Studies (IR/PS) is the only school of international affairs in the University of California system and the only one of its kind in the nation formed to focus on the Pacific Rim. This important region extends from the southern-most 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 programs of IR/PS school 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, diplomacy, public service, journalism, 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 among those peoples on major issues of common concern.

1. The degree programs provide students with professional training for careers in interna-



tional 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 for the school which includes comparisons of different approaches to economic management, for-

eign relations, policy making, 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 Mid-Career Associates Program (IMCAP) is designed for mid-career professionals seeking additional study in international management, international relations, and comparative public policy. Under the auspices of the program, visiting associates from the Pacific region 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. Participants in the program spend an academic year at IR/PS beginning in mid-September and ending in mid-June.

The MPIA program is distinctive in several respects. The program:

1. Exposes students to the perspectives of both private business and public policy making.
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, policy making, 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 economic policy and management, international relations, 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. Expression, analysis, and uses of culture and religion within countries of the Pacific Basin and exploration of problems in communicating across cultures, including the development of innovative teaching methods for these tasks, making use of the performing arts and cultural artifacts and drawing on cultural anthropology, sociolinguistics, and other related subdisciplines in the humanities and social sciences.

5. Comparative analysis of patterns of policy making 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, La Jolla, CA 92093-0520. (619) 534-5914.

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NAME	TITLE	DEPARTMENT	COLLEGE
Abarbanel, Henry D. I.	Professor	Physics	Revelle
Abramson, Ian S.	Associate Professor	Mathematics	Muir
Ackerman, Farrell	Assistant Professor	Linguistics	Third
Agler, Jim	Associate Professor	Mathematics	Muir
Agnew, Duncan C.	Associate Professor	SIO	SIO
Alexander, Nicholas M.	Professor	Pathology	SchMed
Alfven, Hannes	Professor Emeritus	ECE	Muir
Allison, Henry E.	Professor	Philosophy	Revelle
Allison, William S.	Professor	Chemistry	SchMed
Anagnostopoulos, Georgios H.	Associate Professor	Philosophy	Warren
Anderson, Donald W.	Professor/Dean	Mathematics/Natural Sciences	Muir
Anderson, Norman H.	Professor	Psychology	Muir
Anderson, Victor C.	Professor Emeritus	ECE	SIO/Muir
Antin, David A.	Professor	Visual Arts	Muir
Antin, Eleanor	Professor	Visual Arts	Muir
Aref, Hassan	Professor	AMES	Warren/SIO
Armi, Laurence	Professor	SIO	SIO
Arneson, Richard J.	Professor	Philosophy	Third
Arnold, James R.	Professor	Chemistry	Revelle/SIO
Arovas, Daniel P.	Assistant 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
Bailey, Frederick G.	Professor	Anthropology	Muir
Baird, Stephen M.	Associate Professor-in-Res	Pathology	SchMed
Bakhurst, David	Assistant Professor	Communication	Muir
Balzano, Gerald J.	Associate Professor	Music	Muir
Bank, Randolph E.	Professor	Mathematics	Warren
Baouendi, M. Salah	Professor	Mathematics	Warren
Barrett, Kim	Assistant Professor-in-Res	Medicine	SchMed
Bartlett, Douglas H.	Assistant Professor	SIO	SIO
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	Literature	Revelle
Belew, Richard K.	Assistant Professor	CSE	Third
Bender, Edward A.	Professor	Mathematics	Muir
Benirschke, Kurt	Professor	Reproductive Med/Pathology	SchMed
Benson, Andrew A.	Professor Emeritus	SIO	SIO
Benson, David J.	Assistant Professor	AMES	Third
Berg, Darwin K.	Professor	Biology	Warren
Berger, Bennett M.	Professor	Sociology	Muir
Berger, Wolfgang H.	Professor	SIO	SIO

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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
Bickford, Reginald G.	Professor Emeritus	Neurosciences	SchMed
Biernacki, Richard	Assistant Professor	Sociology	Muir
Blanco, Carlos	Professor	Literature	Third
Blantz, Roland C.	Professor-in-Residence	Medicine	SchMed
Bloor, Colin M.	Professor	Pathology	SchMed
Blumberg, Rae L.	Associate Professor	Sociology	Third
Bogart, Anne	Professor	Theatre	Fifth
Bond, F. Thomas	Associate Professor/Provost	Chemistry/Revelle	Revelle
Borjas, George J.	Professor	Economics	Third
Both, Andrei	Acting Associate Professor	Theatre	Third
Bowles, Kenneth L.	Professor Emeritus	CSE	Muir
Boynton, Robert M.	Professor	Psychology	Fifth
Brace, Robert A.	Professor	Reproductive Medicine	SchMed
Bradbury, Jack W.	Professor	Biology	Muir
Bradley, Laurette	Assistant Professor	CSE	Muir
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Braff, David L.	Professor	Psychiatry	SchMed
Branson, James G.	Professor	Physics	Third
Brian, Adrienne A.	Assistant Professor	Chemistry	Warren
Bridges, Amy	Associate Professor	Political Science	Third
Britton, Karen T.	Associate Professor-in-Res	Psychiatry	SchMed
Brody, Stuart	Professor	Biology	Muir
Brown, Joan Heller	Associate Professor	Pharmacology	SchMed
Brown, Marvin R.	Professor-in-Residence	Medicine/Surgery	SchMed
Brown, Sandra A.	Assistant Professor-in-Res	Psychiatry	SchMed
Brown, Willie C.	Associate Professor	Biology	Third
Brueckner, Keith A.	Professor	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
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Burbidge, E. Margaret	University Professor	Physics	Revelle
Burbidge, Geoffrey R.	Professor	Physics	Revelle
Burkhard, Walter A.	Professor	CSE	Warren
Buss, Samuel R.	Assistant Professor	Mathematics	Fifth
Butters, Nelson M.	Professor-in-Residence	Psychiatry	SchMed
Buzsaki, Gyorgy	Associate Professor-in-Res	Neurosciences	SchMed
Cancel, Robert	Associate Professor	Literature	Third
Carmody, James	Assistant Professor	Theatre	Warren
Carpenter, Adelaide T.	Professor	Biology	Warren
Carson, Richard T.	Assistant Professor	Economics	Warren
Casaldiero, Joaquin	Professor Emeritus	Literature	Revelle
Case, Ted J.	Professor	Biology	Revelle
Cassedy, Steven D.	Associate Professor	Literature	Fifth
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Cespedes, Guillermo	Professor Emeritus	History	Revelle
Chang, William S. C.	Professor	ECE	Warren
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Chau, Paul M.	Assistant Professor	ECE	Revelle

Cheatham, James R.	Sr. Lecturer (SOE)	Music	Third
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Chen, Matthew Y. C.	Professor	Linguistics	Muir
Cheng, Chung-Kuan	Assistant Professor	CSE	Muir
Cheng, Tun-jen	Assistant Professor	IRPS	IRPS/Fifth
Chien, Kenneth R.	Associate Professor	Medicine	SchMed
Chien, Shu	Professor	AMES	SchMed
Chodorow, Stanley A.	Professor/Dean	History/Arts and Humanities	Revelle
Chokshi, Atul H.	Assistant Professor	AMES	Fifth
Chrispeels, Maarten J.	Professor	Biology	Muir
Christmas, Eric C.	Professor Emeritus	Theatre	Muir
Churchland, Patricia S.	Professor	Philosophy	Muir
Churchland, Paul M.	Professor	Philosophy	Warren
Cicourel, Aaron V.	Professor	Cognitive Science/Sociology	Revelle
Clark, Leigh B.	Associate Professor	Chemistry	Revelle
Cohen, Alain J. J.	Associate 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
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	Theatre	Warren
Cottrell, Garrison W.	Assistant Professor	CSE	Revelle
Courchesne, Eric	Associate Professor-in-Res	Neurosciences	SchMed
Covell, James W.	Professor	Medicine	SchMed
Cowhey, Peter F.	Professor	Political Science/IRPS	Warren
Cox, Charles S.	Professor	SIO	SIO
Cox, Gary W.	Associate Professor	Political Science	Muir
Cox, Stephen D.	Associate Professor	Literature	Revelle
Craig, Ann L.	Associate Professor	Political Science	Muir
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Crawford, Vincent P.	Professor	Economics	Warren
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Dharmasathaphorn, Kiertisin	Associate Professor	Medicine	SchMed

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Enright, Thomas J.	Professor	Mathematics	Third
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Fenner-Lopez, Claudio E.	Lecturer (SOE)	Visual Arts/Communication	Third
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Ferneyhough, Brian J.P.	Acting Professor	Music	Third
Fierer, Joshua	Professor-in-Residence	Medicine/Pathology	SchMed
Fillmore, Jay P.	Professor	Mathematics	Muir
Firtel, Richard A.	Professor	Biology	Revelle
FitzGerald, Carl H.	Professor	Mathematics	Revelle
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Fredman, Michael L.	Professor	Mathematics/ECE	Warren
Freedman, David Noel	Professor	History	Revelle
Freedman, Michael H.	Professor	Mathematics	Revelle
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Friedkin, Morris E.	Professor Emeritus	Biology	Revelle/SchMed
Friedman, Richard E.	Professor	Literature	Muir
Friedman, Robert M.	Associate Professor	History	Warren
Friedmann, Theodore	Professor	Pediatrics	SchMed
Frieman, Edward A.	Prof/V Chan/Dean/Dir	SIO/Mar Sci/SIO/SIO	SIO
Fujinami, Robert S.	Associate Professor	Pathology	SchMed
Fuller, George M.	Associate Professor	Physics	Fifth
Fung, Yuan-Cheng B.	Professor	AMES	Revelle/SchMed
Fussell, Edwin S.	Professor	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
Getoor, Ronald K.	Professor	Mathematics	Revelle/SchMed
Geyer, Mark A.	Professor-in-Residence	Psychiatry	SchMed
Gharib, Morteza	Associate Professor	AMES	Muir
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
Goldberg, Edward D.	Professor	SIO	SIO
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



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 Grobstein, Clifford
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 Groves, Theodore
 Guasch, J. Luis
 Guest, Clark C.
 Gusfield, Joseph R.
 Gutierrez, Ramon A.
 Guza, Robert T.

Professor
 Professor
 Associate Professor
 Professor
 Assistant Professor
 Professor Emeritus
 Professor
 Professor
 Associate Professor
 Assistant Professor
 Professor
 Professor
 Professor

Economics
 Psychiatry
 Mathematics
 Biology
 Visual Arts
 Biology
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 ECE
 Sociology
 History
 SIO

Warren
 SchMed
 Warren
 Revelle
 Muir
 Revelle/SchMed
 SchMed
 Revelle
 Fifth
 Warren
 Muir
 Third
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Haas, Richard H.
 Haff, Leonard R.
 Hahn, Steven
 Haldane, F. Duncan M.
 Halkin, Hubert
 Halleck, DeeDee
 Hallin, Daniel C.
 Halpern, Francis R.
 Hamao, Yasushi
 Hamburger, Robert N.
 Hamilton, Richard S.
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 Harkins, Edwin L.
 Harper, Elvin
 Harris, William A.
 Harrison, Helen M.
 Harrison, Newton A.
 Harvey, Daniel F.
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 Hauger, Richard L.
 Havis, Allan
 Hawkins, James W.
 Haxo, Francis T.
 Hayashi, Masaki
 Haydu, Jeffrey M.
 Haygood, Margo G.
 Heaton, Robert K.
 Hedrick, Stephen M.
 Hegemier, Gilbert A.
 Heidenreich, Kim
 Heiligenberg, Walter F.
 Helinski, Donald R.
 Heller, Walter P.
 Hellman, Frances
 Helstrom, Carl W.
 Helton, John W.
 Henaff, Marcel
 Hendershott, Myrl C.
 Hendrickson, David N.
 Hendry, David F.
 Herbert, Timothy D.
 Herz, Richard K.
 Hessler, Robert R.

Associate Professor
 Professor
 Professor
 Professor
 Professor
 Associate Professor
 Associate Professor
 Professor Emeritus
 Assistant Professor
 Professor
 Professor
 Professor Emeritus
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 Assistant Professor
 Professor Emeritus
 Assistant Professor-in-Res
 Assistant Professor
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 Assistant Professor
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 Associate Professor
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 Associate Professor-in-Res
 Professor
 Professor
 Professor
 Assistant Professor
 Professor
 Professor
 Acting Professor
 Professor
 Professor
 Acting Professor
 Assistant Professor
 Associate Professor
 Professor

Neurosci/Pathol/Pediatrics
 Mathematics
 History
 Physics
 Mathematics
 Communication
 Communication
 Physics
 IRPS
 Pediatrics
 Mathematics
 SIO
 Music
 Chemistry
 Biology
 Visual Arts
 Visual Arts
 Visual Arts
 Chemistry
 SIO
 Psychiatry
 Theatre
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 SIO
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 Sociology
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 Psychiatry
 Biology
 AMES
 Medicine
 SIO
 Biology
 Economics
 Physics
 ECE
 Mathematics
 Literature
 SIO
 Chemistry
 Economics
 SIO
 AMES
 SIO

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

Hildebrand, John A.	Assistant Professor	SIO	SIO
Hillyard, Steven A.	Professor	Neurosciences	SchMed
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Hirsch, Jorge E.	Professor	Physics	Revelle
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Holmgren, Beth	Assistant Professor	Literature	Warren
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Horwitz, Robert B.	Associate Professor	Communication	Third
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Howe, Fanny Q.	Professor	Literature	Warren
Howell, Stephen B.	Professor	Medicine	SchMed
Hsueh, Aaron J. W.	Professor	Reproductive Medicine	SchMed
Hu, Ping C.	Lecturer (SOE)	History	Muir
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Hughes, H. Stuart	Professor Emeritus	History	Revelle
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Jeste, Dilip V.	Professor-in-Residence	Psychiatry/Neurosciences	SchMed
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Jones, Barbara	Associate Professor	Physics	Muir
Jones, Walton	Associate Professor	Theatre	Muir
Jordan, David K.	Professor	Anthropology	Revelle
Judd, Lewis L.	Professor	Psychiatry	SchMed
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Kahler, Miles E.	Professor	IRPS	IRPS/Fifth
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Kavanagh, Karen L.	Assistant Professor	ECE	Fifth
Kearns, David R.	Professor	Chemistry	Revelle
Keeling, Charles D.	Professor	SIO	SIO
Kelner, Michael J.	Assistant Professor	Pathology	SchMed
Kemmer, Suzanne E.	Assistant Professor	Linguistics	Third
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Keyssar, Helene	Professor	Communication	Third
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Kirkpatrick, Susan	Professor	Literature	Muir
Kirsch, David J.	Assistant Professor	Cognitive Science	Fifth
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Kitcher, Philip S.	Professor	Philosophy	Warren
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Klima, Edward S.	Professor	Linguistics	Muir
Konecni, Vladimir J.	Professor	Psychology	Muir
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Ku, Walter H.	Professor	ECE	Revelle
Kube, Paul R.	Assistant Professor	CSE	Third
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Kyte, Jack E.	Professor	Chemistry	Warren
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Langacker, Ronald W.	Professor	Linguistics	Revelle
Langdon, Margaret H.	Professor	Linguistics	Warren
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Markenscoff, Xanthippe	Professor	AMES	Revelle
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Marti, Kurt	Professor	Chemistry	Revelle
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McClain, Donald A.	Assistant Professor-in-Res	Medicine	SchMed
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McMorris, Trevor C.	Professor	Chemistry	Third
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Mehan, Hugh B., Jr.	Professor	Sociology	Third
Meiners, Larry G.	Associate Professor	ECE	Third
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Meranze, Michael	Assistant Professor	History	Third
Metzger, Thomas A.	Professor	History	Muir
Meyers, Marc A.	Professor	AMES	Revelle
Middleman, Stanley	Professor	AMES	Warren
Miles, John W.	Professor Emeritus	AMES	Warren
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Miller, David R.	Professor	AMES	Revelle
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Miller, Stanley L.	Professor	Chemistry	Revelle
Mills, Stanley E.	Professor	Biology	Muir
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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	Physics/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
Moore, Stanley W.	Professor Emeritus	Philosophy	Revelle
Mosshammer, Alden A.	Professor	History	Revelle
Motulsky, Harvey J.	Assistant Professor-in-Res	Pharmacology	SchMed
Mukerji, Chandra	Professor	Sociology/Communication	Third
Mullin, Michael M.	Professor	SIO	SIO
Munk, Walter H.	Professor Emeritus	SIO	SIO/Warren
Murakami, Hidenori	Associate Professor	AMES	Revelle
Myers, Robert R.	Professor-in-Residence	Anesthesiology/Neurosciences	SchMed
Nachbar, William	Professor	AMES	Revelle
Naughton, Barry	Assistant Professor	IRPS	IRPS
Nee, Thomas B.	Professor	Music	Warren
Negyesy, Janos	Professor	Music	Muir
Nelson, Ann E.	Assistant Professor	Physics	Muir
Nemat-Nasser, Siavouche	Professor	AMES	Revelle
Nesbitt, Muriel N.	Associate Professor	Biology	SchMed/Warren
Newman, William A.	Professor	SIO	SIO
Newmark, Leonard D.	Professor	Linguistics	Revelle
Newport, John W.	Associate 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
Noble, Gregory W.	Assistant Professor	Political Science	Muir
Nodelman, Sheldon A.	Associate Professor	Visual Arts	Warren
Norman, Donald A.	Professor	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.	Associate Professor-in-Res	Medicine	SchMed
O'Connor, Joseph M.	Assistant Professor	Chemistry	Third
Oesterreicher, Hans K.	Professor	Chemistry	Muir
Ogdon, Wilbur L.	Professor	Music	Muir
Okamura, Melvin Y.	Professor	Physics	Revelle
Olafson, Frederick A.	Professor	Philosophy	Revelle
Olefsky, Jerrold M.	Professor	Medicine	SchMed
Olfe, Daniel B.	Professor	AMES	Revelle
Olshen, Richard	Professor	Mathematics	SchMed
O'Neil, Thomas M.	Professor	Physics	Warren
Onuchic, Jose N.	Assistant Professor	Physics	Muir
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
Pandol, Stephen J.	Associate Professor-in-Res	Medicine	SchMed
Papadimitriou, Christos H.	Professor	CSE	Muir
Parker, Robert L.	Professor	SIO	SIO
Parrish, Michael E.	Professor	History	Muir
Parry, Christopher N.	Assistant 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.	Associate Professor	Visual Arts	Muir
Paturi, Ramamohan	Assistant Professor	CSE	Warren
Pearce, Roy Harvey	Professor	Literature	Fifth
Pearson, J. Steven	Associate Professor	Theatre	Muir
Penn, Nolan E.	Professor	Psychiatry	SchMed
Penner, Stanford S.	Professor	AMES	Revelle
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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
Phillips, Robyn S.	Assistant Professor	Economics	Third
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
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Pinon, Ramon, Jr.	Associate Professor	Biology	Third
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Pippin, Robert B.	Professor	Philosophy	Revelle
Plantamura, Carol	Professor	Music	Revelle
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Powell, Henry C.	Professor	Pathology	SchMed
Pozrikidis, Constantine	Assistant Professor	AMES	Muir
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Price, Trevor D.	Assistant Professor	Biology	Muir
Priestley, M. J. Nigel	Professor	AMES	Warren
Printz, Morton P.	Professor	Pharmacology	SchMed
Propp, William H.	Assistant Professor	History	Muir
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Rafael, Vicente L.	Assistant Professor	Communication	Warren
Raitt, Russell W.	Professor Emeritus	SIO	SIO
Ramachandran, Vilayanur S.	Professor	Psychology	Third
Ramanathan, Ramachandra	Professor	Economics	Revelle
Ramey, Garey	Assistant Professor	Economics	Warren
Ramey, Valerie A.	Assistant Professor	Economics	Third
Rand, Sinai	Associate Professor	AMES	Revelle
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Rao, Bhaskar D.	Associate Professor	AMES	Revelle
Rao, Ramesh	Assistant Professor	ECE	Revelle
Rapaport, Samuel I.	Professor	Medicine/Pathology	SchMed
Rasmussen, Dennis D.	Associate Professor-in-Res	Reproductive Medicine	SchMed
Rauch, James E.	Assistant Professor	Economics	Third
Raut, Lakshmi K.	Assistant Professor	Economics	Warren
Rearden, C. Anne	Associate Professor	Pathology	SchMed
Reid, Joseph L.	Professor	SIO	SIO
Reid, Roddey	Assistant Professor	Literature	Muir
Reissner, M. Erich	Professor Emeritus	AMES/Mathematics	Revelle
Rommel, Jeffrey D.	Professor	Mathematics	Muir
Revelle, Roger R.	Prof. Emeritus/Dir. Emeritus	Political Science/SIO	Revelle/SIO
Reynolds, Edward	Professor	History	Third
Reynolds, Roger L.	Professor	Music	Muir
Rice, John A.	Professor	Mathematics	Revelle
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
Ringgold, Faith	Professor	Visual Arts	Muir
Ringrose, David R.	Professor	History	Revelle
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Robertson, Jennifer E.	Assistant Professor	Anthropology	Warren
Rodin, Burton	Professor	Mathematics	Muir
Roeder, Philip G.	Assistant Professor	Political Science	Third
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Rohrl, Helmut	Professor	Mathematics	Revelle
Roise, David	Assistant Professor	Chemistry	Warren
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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	ECE	Muir

Rothenberg, Jerome D.	Professor	Visual Arts/Literature	Fifth
Rothschild, Linda P.	Professor	Mathematics	Warren
Rothschild, Michael	Professor/Dean	Economics/Social Sciences	Third
Rudee, M. Lea	Professor/Dean	ECE/Engineering	Warren
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Ruggie, John G.	Professor	IRPS	IRPS/Fifth
Ruggie, Mary	Associate Professor	IRPS/Sociology	IRPS/Fifth
Ruiz, Ramon E.	Professor	History	Muir
Rumsey, Victor H.	Professor Emeritus	ECE	Muir
Russell, Percy J.	Associate Professor	Biology	SchMed
Saier, Milton H., Jr.	Professor	Biology	Muir
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Saks, Michael E.	Professor	CSE	Third
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
Saville, Jonathan	Associate Professor	Theatre	Revelle
Saville, Julie	Assistant Professor	History	Third
Savitch, Walter J.	Professor	CSE	Muir
Scanga, Italo	Professor	Visual Arts	Muir
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Schmidt, Robert J.	Assistant Professor	Biology	Warren
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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	AMES	Third
Segal, David S.	Professor	Psychiatry	SchMed
Seible, Frieder	Professor	AMES	Third
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Shafir, Gershon	Associate Professor	Sociology	Fifth
Shaiken, Harley	Associate Professor	Communication	Revelle
Sham, Lu Jeu	Professor	Physics	Warren
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Shank, Theodore J.	Professor	Theatre	Revelle
Shapin, Steven	Professor	Sociology	Revelle
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Shuler, Kurt E.	Professor	Chemistry	Revelle
Shults, Clifford W.	Assistant Professor	Neurosciences	SchMed
Siegel, Jay S.	Assistant Professor	Chemistry	Muir
Silber, John J.	Professor	Music	Fifth
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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
Smith, Susan L.	Assistant Professor	Visual Arts	Third
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Solis, Faustina	Professor	Comm & Fam Med	Third
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Somerville, Richard C. J.	Professor	SIO	SIO
Sorensen, Harold W.	Professor	AMES	Revelle
Spector, Deborah H.	Professor	Biology	SchMed/Fifth
Spiess, Fred N.	Professor	SIO	SIO
Spiro, Melford E.	Professor	Anthropology	Muir
Spitzer, Nicholas C.	Professor	Biology	Muir
Spivack, Arthur J.	Assistant Professor	SIO	SIO
Spooner, Charles E.	Professor	Neurosciences	SchMed
Squire, Larry R.	Professor-in-Residence	Psychiatry	SchMed
Stark, Harold M.	Professor	Mathematics	Muir
Starr, Ross M.	Professor	Economics	Warren
Steiger, Rand	Assistant Professor	Music	Warren
Steinberg, Daniel	Professor	Medicine	SchMed
Steinmetz, Philip A.	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-Davis, Joan	Associate Professor	Psychology	Muir
Stinchcombe, Maxwell B.	Assistant Professor	Economics	Third
Storms, Lowell H.	Professor-in-Residence	Psychiatry	SchMed
Stroll, Avrum	Professor	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	Assistant Professor	Anthropology	Third
Subramani, Suresh	Associate Professor	Biology	Warren
Suess, Hans E.	Professor Emeritus	Chemistry	Revelle/SIO
Sueyoshi, Glenn	Assistant Professor	Economics	Revelle
Sugihara, George	Associate Professor	SIO	SIO
Suhl, Harry	Professor	Physics	Revelle
Surko, Clifford M.	Professor	Physics	Third
Swain, Susan L.	Professor-in-Residence	Biology	Revelle
Swanson, Robert A.	Professor	Physics	Revelle

UCSD FACULTY MEMBERS

Swartz, Marc J.	Professor	Anthropology	Muir
Sworder, David D.	Professor	AMES	Revelle
Taetle, Raymond	Associate Professor	Medicine/Pathology	SchMed
Talbot, Jan B.	Associate Professor	AMES	Muir
Talke, Frank E.	Professor	AMES	Warren
Talley, Lynne D.	Associate 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
Terrell, Tracy D.	Professor	Linguistics	Fifth
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)	Mathematics	Third
Thomas, Charles W. II	Professor	Third College (USP)	Fifth
Thompson, William B.	Professor	Physics	Revelle
Ticho, Harold K.	Professor	Physics	Third
Tilley, T. Don	Associate Professor	Chemistry	Third
Tohsaku, Yasu-Hiko	Associate Professor	IRPS	IRPS/Fifth
Tokuyasu, Kiyoteru	Professor-in-Residence	Biology	Revelle
Tomlinson, Barbara	Associate Professor	Literature	Muir
Trauner, Doris A.	Professor	Neurosciences/Pediatrics	SchMed
Traylor, Teddy G.	Professor	Chemistry	Revelle
Trogler, William C.	Professor	Chemistry	Revelle
Truant, Cynthia M.	Assistant Professor	History	Fifth
Tschirgi, Robert D.	Professor Emeritus	Neurosciences	SchMed/Muir
Tsien, Roger K.	Professor	Pharmacology/Chemistry	SchMed/Revelle
Tu, Charles W.	Associate 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
Tytler, David R.	Acting Associate Professor	Physics	Muir
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.	Associate Professor	Medicine	SchMed
Varon, Silvio S.	Professor	Biology	SchMed
Vecchio, Kenneth S.	Assistant Professor	AMES	Fifth
Vehrencamp, Sandra L.	Associate 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
Vold, Robert L.	Professor	Chemistry	Revelle
Von Lates, Adrienne	Assistant Professor	Visual Arts	Muir

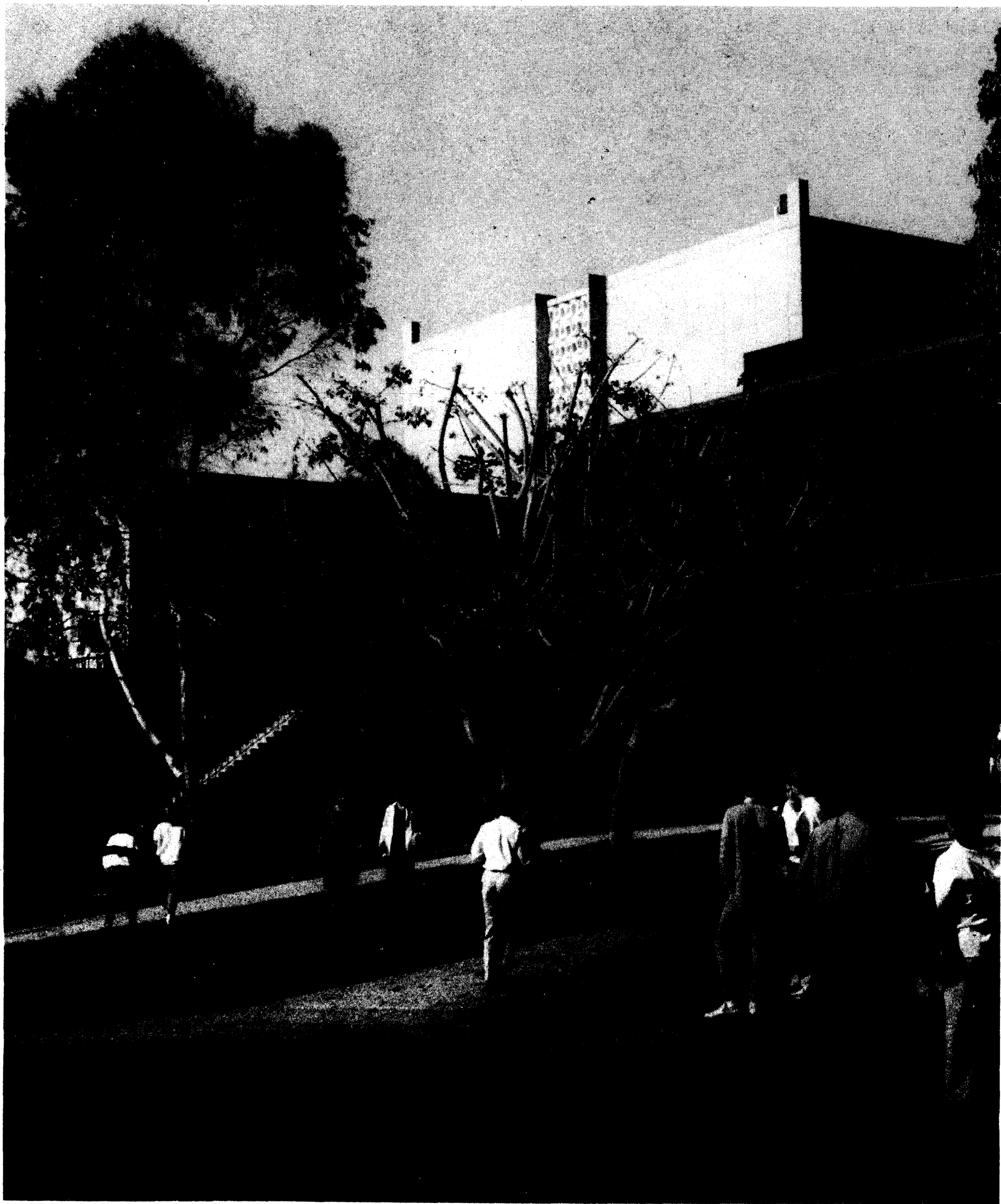
UCSD FACULTY MEMBERS

Wadsworth, Adrian R.	Professor	Mathematics	Warren
Wagner, Arthur	Professor Emeritus	Theatre	Muir
Wagner, Peter D.	Professor	Medicine	SchMed
Waisman, Carlos H.	Professor	Sociology	Third
Walicke, Patricia A.	Assistant Professor	Neurosciences	SchMed
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/Undergraduate Affairs	Third
Watson, Kenneth M.	Professor	SIO	SIO
Wavrik, John J.	Associate Professor	Mathematics	Muir
Wayne, Don E.	Associate Professor	Literature	Muir
Weare, John H.	Professor	Chemistry	Revelle
Weinger, Matthew B.	Assistant Professor	Anesthesiology	SchMed
Weiss, Ray F.	Professor	SIO	SIO
Wenkert, Ernest	Professor	Chemistry	Revelle
Wenzl, Hans	Assistant Professor	Mathematics	Third
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
Wieder, Harry H.	Professor-in-Residence	ECE	Muir
Wiederholt, Wigbert C.	Professor	Neurosciences	SchMed
Wiley, Clayton A.	Associate Professor	Pathology	SchMed
Williams, Ben A.	Professor	Psychology	Muir
Williams, Forman A.	Professor	AMES	Third
Williams, Ruth J.	Associate Professor	Mathematics	Warren
Williams, Sherley A.	Professor	Literature	Third
Williamson, Stanley G.	Professor	Mathematics	Fifth
Wills, Christopher	Professor	Biology	Warren/SchMed
Wilson, Kent R.	Professor	Chemistry	Revelle
Winant, Clinton D.	Professor	SIO	SIO
Winker, James R.	Assistant Professor	Theatre	Third
Winterer, Edward L.	Professor	SIO	SIO
Wiseman, Jacqueline P.	Professor	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
Woo, Savio L-Y.	Professor	Surgery/AMES	SchMed
Woodhull, Winifred	Assistant Professor	Literature	Warren
Woodruff, David S.	Professor	Biology	Fifth
Woolard, Kathryn A.	Associate Professor	Sociology	Muir
Wright, Andrew	Professor	Literature	Revelle
Wulbert, Daniel E.	Professor	Mathematics	Third
Xuong Nguyen-Huu	Professor	Biology/Chemistry/Physics	Revelle/SchMed
Yaffe, Michael P.	Assistant Professor	Biology	Third
Yaksh, Tony L.	Professor	Anesthesiology	SchMed

UCSD FACULTY MEMBERS

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
York, Herbert F.	Professor Emeritus	Physics	Warren
Young, William R.	Associate Professor	SIO	SIO
Yu, Paul K. L.	Associate Professor	ECE	Revelle
Yuasa, Joji	Professor	Music	Warren
Zamosc, Leon	Associate Professor	Sociology	Warren
Zimm, Bruno H.	Professor	Chemistry	Revelle
Zipser, David	Professor	Cognitive Science	Fifth
Zisook, Sidney	Professor	Psychiatry	SchMed
Zivin, Justin A.	Professor	Neurosciences	SchMed
Zola-Morgan, Stuart M.	Associate Professor-in-Res	Psychiatry	SchMed
Zuker, Charles	Associate Professor	Biology/Neurosciences	Revelle
Zweifach, Benjamin W.	Professor Emeritus	AMES	Warren/SchMed







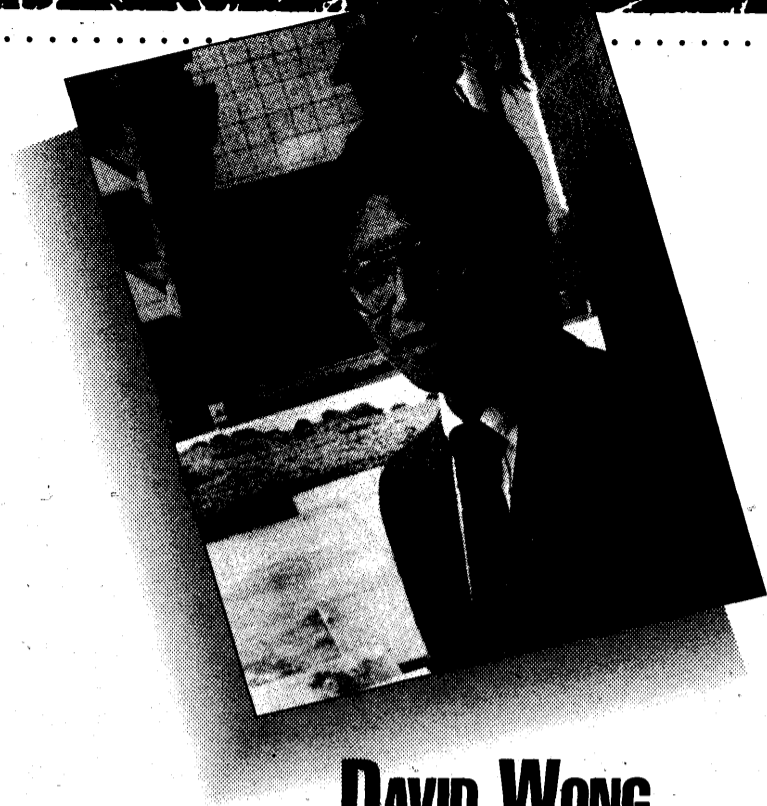
The University of California, San Diego is one of the newer campuses of the University of California. We recently celebrated twenty-five years of rapid growth. In spite of its chronological age, UCSD is one of the major universities in the country, a fact recognized by its membership in The Association of American Universities (other California universities in the AAU are UC Berkeley, UCLA, USC, Stanford, and Caltech). Central to this rapid rise to national prominence is the excellence of the faculty. By almost any measure, our faculty rate among the very best. For example, UCSD ranks sixth in the nation in the number of its faculty who are members of the National Academy of Sciences (the top ten universities in order are Harvard, MIT, Stanford, UC Berkeley, Caltech, UCSD, Chicago, Yale, Wisconsin, and Columbia). UCSD faculty have also been elected in substantial numbers to the American Academy of Arts and Sciences, the National Academy of Engineering, the Institute of Medicine, and the American Philosophical Society.

Approximately 17,000 undergraduate and graduate students pursue degrees in a wide variety of academic programs at UCSD. The undergraduate program at San Diego embodies the cluster college concept; each student and faculty member belongs to one of the five colleges, and each college has its own general-education requirements. This college structure provides an unusual environment of social and academic interaction which is rarely found on university campuses.

Our undergraduate program has received increasing national recognition. Two recent surveys—one to rank universities on the number of their graduates accepted into medical school and the other, graduates accepted into doctoral programs—rated UCSD number one among public universities in placing students in these areas.

I am convinced that the distinguished faculty we have assembled and the academic programs they have developed, together with the splendid physical setting of the campus, combine to provide a university experience difficult to equal. The interviews which follow give some interesting insights into UCSD by those whose presence is integral to that experience: UCSD's faculty, staff, and students.

Richard C. Atkinson



DAVID WONG

PROVOST OF WARREN COLLEGE

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Physicist David Wong assumed the duties of provost of Warren College in 1985, in addition to teaching physics to graduate and undergraduate students. Wong began his association with the University of California in the late 1950s at the UC Lawrence Radiation Laboratory at Berkeley; two years later he moved to La Jolla and became a founding faculty member at the then newly formed UCSD campus.

Wong's deep commitment to the UCSD campus is reflected in his continued associations with academic and administrative programs. He has served on numerous committees, including as chairman of the Educational Policy and Tenure Committee. He also served on the Academic Senate Executive Policy Committee and on the Campus Community Planning Committee. He was chairman of the Department of Physics from 1977-80.

Wong's honors include the prestigious Sloan Fellow research award and memberships in the American Institute of Physics and in the American Physical Society. He received his Ph.D. from the University of Maryland, College Park; he was born in China and received his secondary education in Macau.

Q. Since Warren College was founded in 1974, have there been any changes in the philosophy of the college that would affect the general-education requirements?

A. Warren College is designed with the focus of preparing its students for life in our society. In that regard, the college has more of a postbaccalaureate emphasis. The general-education requirements were originally designed to include two secondary areas of study, one of which would be contiguous to the major and the second, noncontiguous. The idea was that a contiguous secondary area would allow students to acquire depth in their major. Since 1974, the accent on postbaccalaureate activity has not changed. However, society has. By the mid-eighties it was apparent that professional schools, research institutions, and industry were finding that students did not have enough education in subjects outside of their majors. So, while adhering to the goal of postbaccalaureate career preparation, we changed the graduation requirements to include two secondary areas which would be noncontiguous to the major, giving students a wider breadth of learning.

Q. How does this affect the students' choice of subjects? Do they enroll in humanities or liberal arts courses to balance an engineering major, for example?

A. Yes. If the student is a science major, that would be the case. But if he or she is a social science major, then the secondary areas would have to be in science and the humanities. In doing so, we maintain the idea that a broad education is not one that involves a large number of survey courses. We emphasize the point that for any area a student chooses to study, a degree of depth is needed. That translates into requiring upper-division courses outside of the major. That is a specific characteristic of a major for a Warren College student.

Q. When did Warren College effect this change in general-education requirements?

A. In 1985. But, in that same year we also changed the engineering general-education requirements. Again, I think it was a response to the changing times. While the breadth requirement needed to be stressed, the

The new program I have introduced is a campus-wide, one-unit undergraduate seminar program, which has grown to more than sixty seminars per year.

requirements for the major had steadily increased to the point where we felt that we had to reduce the number of breadth courses for engineers. So we reduced the quantity while keeping the quality. We now require three courses in the humanities, at least one of which is upper division, and the same for the social sciences. I think that in the future, if we feel the world around us has changed enough for us to reexamine our general-education requirements, we will do so again.

Q. Are parents active in many Warren College activities?

A. Warren parents are quite involved. I think we were the first college to have a formalized parents' council, consisting entirely of Warren students' parents.

They attend regional meetings in San Francisco, Los Angeles, and in San Diego. They organize and participate in a Parents' Weekend during winter quarter, they host a reception during Commencement Exercises, and take part in the June orientation for parents of new freshmen. The largest attendance is about 150, for the parents' weekend. It's a big hit.

Q. How many students drop out of Warren College?

A. There are 3,500 students in the undergraduate program at Warren, and the drop-out rate is about the same as for the other colleges. Campus-wide, attrition has decreased rather significantly in the last four years. We lose about 40 percent by graduation, but add transfer students. Freshman retention is now close to 90 percent, used to

be 80 percent. Warren's freshman class this year numbers approximately 600.

Q. If you had to say what was special about Warren College—in your five years' experience as provost—what would you consider to be its most remarkable aspect?

A. In the last five years, one of the most remarkable—and most visible changes—is that Warren College finally has a campus area identified with it, and a campus master plan. Most of the building has gone on in the past five years. The Engineering Building, the Instruction and Research Building, the Powell Structural Systems Lab, and the High Bay Physics Lab, for example.

Q. I understand that Warren College is going to have a new residence hall in addition to the existing Warren College Apartments complex.

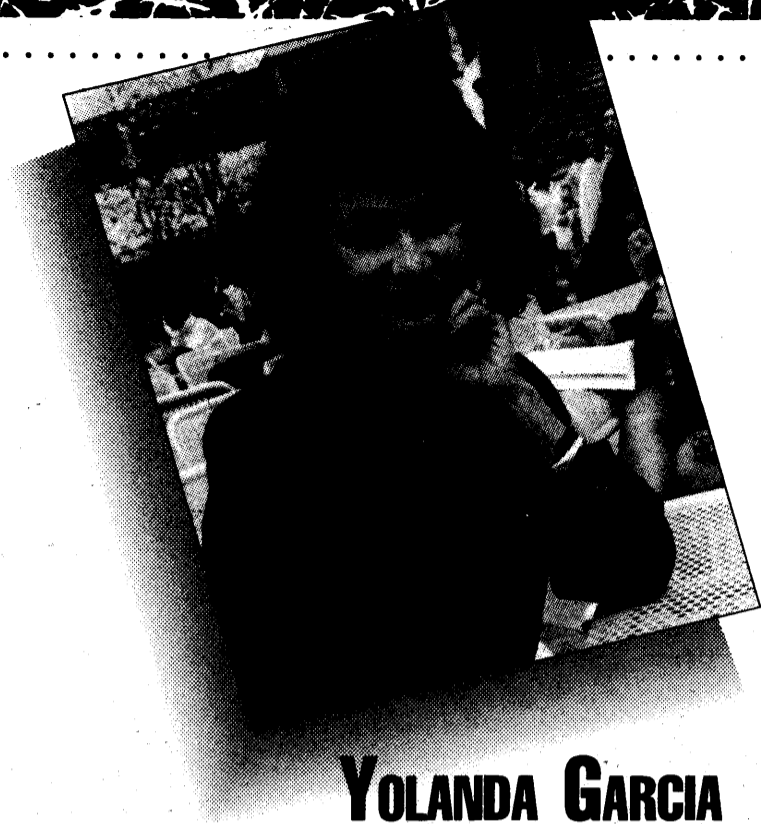
A. Warren College is the only one of the UCSD colleges that has only an apartment complex, while the other colleges have residence halls and apartments. So, by 1993, we will add 500 dormitory rooms—singles and doubles—built around suites that will house eight students apiece. The building site is located just north of the existing Warren Apartments.

Q. With all of those technically oriented buildings on Warren campus, one might think Warren students were more inclined toward scientific careers. Are they?

A. Even though Warren campus houses technical centers, all majors are available to all UCSD students, irrespective of the students' college affiliation, or of the physical location of the buildings. It is true that Warren College has a higher percentage of engineers—not scientists—because the general-education requirements cater to them in a special way—not because of the buildings on campus. I suppose in some sense it is appropriate, but incidental, that the buildings are there.

Q. What academic programs are unique to Warren College?

A. Warren has a history of introducing academic programs which have become all-UCSD. The three original programs are the Academic Internship Program, the health care/social issues minor program—which started out as an honors program for pre-med students—and the Law and Society Program, which was introduced to fill the needs of pre-law students. The new program I have introduced is a campus-wide, one-unit undergraduate seminar program, which has grown to more than sixty seminars per year. This was started in 1987. The seminars are typically one hour, and meet eight to ten times during the quarter. Some of the topics covered are medical physics, investigation of brain function, an analysis of social interaction, a seminar on personal income tax in the United States, and Third College provost Cecil Lytle's seminar dealing with how Beethoven changed his composition style for his last four sonatas. It's all very interesting material. I think it's consistent with the spirit of Warren College to have seminar choices like that.



YOLANDA GARCIA

**DIRECTOR OF SPECIAL STUDENT PROGRAMS
AND VOLUNTEER SERVICES**

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Yolanda Garcia is that *rara avis*, a native San Diegan who grew up here and attended area schools all her life. She has been on the UCSD staff for eighteen years. Before assuming the newly created position of director of special student programs and volunteer services this year, she was assistant dean of Revelle College where the senior classes of 1976 and 1981 awarded her Revelle's Outstanding Service Award. A special award for Outstanding and Distinguished Service was presented by the entire Revelle student body to Garcia in 1989.

Many students just enjoy volunteering, especially with children. I think others volunteer in areas that will be educationally beneficial, possibly helping them to make career choices.

Q. What is the work of this new office?

A. One of my first responsibilities was the preparation of a comprehensive student handbook for distribution at freshman orientation in June. Until now, each college has had its own handbook but there was nothing with university-wide information. The new handbook provides information about all five colleges and all university student services, from the Student Health Service to the Stuart Art Collection to physical education and recreation programs.

Q. What are your other assignments?

A. I'm chairperson of the campus-wide Open House we hold for the community in the spring, and I chair the campus-wide Welcome Week committee. I am the adviser of the Volunteer Connection, a student-directed organization which serves as a clearinghouse for students who want to perform community service. My challenge is to involve more UCSD students and staff in the community.


Q. What happens during Welcome Week?

A. Welcome Week takes place in September, the week before school opens. It includes social as well as educational events. The week kicks off with a brunch hosted by the vice chancellor of Undergraduate Affairs, Joseph Watson. All student services and organizations are invited to disseminate information about their services at a Price Center preview. A reception is hosted by the chancellor, his wife, and the Associated Students president for all new students to UCSD. We have OASIS programs—writing and reading diagnostic testing by the university's tutoring service—a welcome dance, and welcome picnic. There's a large-scale fun sporting event, the Un-Olympics.

Q. Does Welcome Week include transfers?

A. We encourage transfer students to attend all activities. They will find it particularly helpful since their single orientation day is almost entirely devoted to academics.





There are many cultural resources in Tijuana that students aren't aware of and could take advantage of. We'll be taking students on field trips to the Cultural Center and art exhibits.

Q. What programs go on during the year?

A. I'm involved in the UCSD-Tijuana Cultural Connection to develop a more positive relationship between San Diego students and Tijuana. There are many cultural resources in Tijuana that students aren't aware of and could take advantage of. We'll be taking students on field trips to the Cultural Center and art exhibits. We hope to have some exchanges—bring Tijuana students here to talk about issues of concern to them—ways we might work out some of the problems that exist between the two border countries.

Q. What about the Volunteer Connection?

A. In 1987 Assemblyman John Vasconcellos wrote AB1820, the Human Corps bill that asks the University of California and California State Universities to encourage students to perform an average of thirty hours of some type of community service work each academic year. UCSD is making progress and complying with this bill. There is a program at each of the five colleges at UCSD.

Q. What types of community service work are available?

A. The Volunteer Connection serves 250 nonprofit, off-campus agencies throughout the county. Students can volunteer for work in health care, recreation, tutoring—whatever they're interested in. If you like to work with animals, for example, you can find an agency working in animal care.

Q. What is the most popular volunteer service?

A. Working with children! The ASK Program—Active Students for Kids—has 130 UCSD students currently tutoring in the community and working with children. We currently have volunteer tutors at several elementary schools in San Diego.

Q. Do students tend to select volunteer work connected with their major or career goal, or look for something completely removed from school?

A. There are a variety of reasons students choose to volunteer. Many students just enjoy volunteering, especially with children. I think

others volunteer in areas that will be educationally beneficial, possibly helping them to make career choices. Others volunteer to increase their chance of being accepted to graduate school. Some students just want to participate in a positive way in their communities.

Q. Is community involvement growing?

A. I think there's a real drive across campus to volunteer activity. Forty-six percent of the UCSD students who responded to a survey last year indicated that they've been involved in some kind of volunteer service. As a matter of fact, Third College currently is looking into the possibility of a requirement in community service for their honor student program.

Q. What differences, if any, do you see between today's students and those of eighteen years ago?

A. Students today seem to have more drive and motivation. They're not easily intimidated by obstacles. They demand more of the institution. They also want to play a greater part in the decisions which affect them. I admire their leadership.



D. ASOKA MENDIS

PROFESSOR OF ELECTRICAL ENGINEERING

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Asoka Mendis is one of the world's leading experts on comets. The Sri Lanka-born theoretical physicist has spent more than twenty years studying comets and dusty plasmas in space. Mendis earned his B.Sc. in mathematics from the University of Sri Lanka (then Ceylon). He left Sri Lanka to pursue graduate studies in astrophysics at the University of Manchester, England. He received his Ph.D. in 1967, and was later awarded a doctor of science degree by the same university in 1978.

Mendis joined the UCSD faculty in 1969. One of his professional highlights occurred in 1986—the year of the Comet Halley missions. Mendis was the only U.S. researcher invited by both the Europeans and the Soviets to partake in the interpretation of data obtained from the spacecrafts Vega and Giotto. The data confirmed several of his theories, including one that the comet consists of an icy nucleus surrounded by an insulating mantle of dust.

Q. Starting out as a mathematician, how did you get interested in astrophysics?

A. When I was a little boy, my father, who was an irrigation surveyor, let me accompany him on field trips. He was a dedicated amateur astronomer, and always brought a small telescope on our safaris. As an observer, my father's knowledge of the night sky by far exceeds mine. I can still remember the first time he showed me the rings of Saturn.

In high school I read popular books on astrophysics, but at that time it was not a significant part of the curriculum of the University of Sri Lanka. So, I decided to do my first degree in mathematics as a preparation for further research in theoretical astrophysics. In retrospect, it turned out to be a very good decision. Mathematics is the language of physics, and a solid background in mathematics gives you a head start in any branch of physics.

Q. Why did you focus on comets?

A. It would be nice to say that I understood from the beginning that comets were highly interesting objects of great cosmogonic significance. But I got into the subject by mere accident. I came to UCSD to continue my research on interstellar gas dynamics. But soon after I came here, two bright naked-eye comets were observed, not only in the optical, but also for the first time using ultraviolet detectors on orbiting spacecraft outside the atmosphere. The detectors revealed an amazingly large halo of atomic hydrogen. Its origin was a puzzle, and a colleague and I decided to pursue it. I found these studies very much to my liking, and I discovered that although comets are the most pristine objects in the Solar System, very little systematic work had been done in cometary physics.





Q. Are comets to blame for the extinction of dinosaurs?

A. I am often asked this question, and it is not easy to give a brief answer. While some parts of this theory are based on careful observations, other parts are totally speculative and ad-hoc. The evidence of several episodes of mass extinction of species, including the one that caused the demise of dinosaurs about 65 million years ago, is widely accepted, and geologists have found iridium depositions that are attributed to extraterrestrial bombardment. But there are still many questions that have not been answered. I am skeptical that comets are to blame, but it is still a legitimate scientific question. Its final legacy may not be that it was right, but rather that it stimulated further inquiry in many diverse branches of science.

Q. What are the most important future issues in your field?

A. The missions to comets Giacobini-Zinner and Halley told us a great deal about the superficial features of the comet's nucleus and the environment of the "activated" comet. The scheduled 1995 joint NASA/ESA mission to comet Kopff (the CRAF/Cassini mission) will focus on the internal structure, and the chemical and mineralogic composition of the nucleus. A special device, called a penetrator, will be shot into the core in 2001. I am quite involved in the planning of this mission as a co-investigator of both the penetrator and the magnetometer, and as the designated interdisciplinary scientist for comet solar wind interactions. The remaining time I will spend on my other research interest—the physics of cosmic dusty plasma.

Q. How do you differentiate between astrophysics and space science?

A. I think of space science as the branch of astrophysics where you can perform in situ

observations. The study of comets went from astrophysics to space science in September 1985, when the NASA/ICE spacecraft encountered the tail of comet Giacobini-Zinner.

Q. Do students share your enthusiasm for space science?

A. My graduate students have all been highly motivated and competent, and certainly have shared my enthusiasm. As far as undergraduate students are concerned, they are aware of the recent exciting developments in the field, and show genuine interest.

Q. Why should a student pursue a degree in space science?

A. First, because it is a thoroughly exciting field. Sometimes I feel like the old explorers, mapping new territories. Space science is the new frontier of exploration, and recent findings about our planetary system and the Earth's environment have led to a quantum leap in our knowledge. Space science also provides a wonderful opportunity to learn physics. In developing theories and planning missions, you stay in the mainstream of physics. And unlike scientists in the sister discipline of astrophysics, you can actually go out there and test your theories. It keeps you honest, and prevents you from wasting your time on personally appealing, but incorrect speculations.

Q. Is there a professional career for graduates in space science outside academia?

A. If you are a theoretician like myself, the largest employer is still academia, although positions are available in the national laboratories and research centers. Of course, for experimentalists there are positions in all these places as well as in aerospace and space technology industries.

Q. Are there large numbers of women and minority students in your field?

A. Extremely small. Women are underrepresented in all branches of physics, but the situation is even worse in space science. And minorities are virtually nonexistent. My last graduate student was a woman. She did exceptionally well, and has already made significant contributions in the field. My next graduate student is a minority woman, who is presently employed at the Jet Propulsion Laboratory. Some of the best students I have had in the mathematical methods course have been women. So there is no dearth of talent. We need, however, to convince potential candidates that a research career in space science is a viable one.

Q. What new perspectives do the recent changes in Europe and the U.S.S.R. introduce in space science?

A. The political changes in Eastern Europe and the U.S.S.R. provide greater opportunity for cooperation, rather than competition, in space. This would eliminate duplication of effort, and enable the available resources to be put to maximum use for the common good of enhancing our knowledge about the Earth and the Solar System.

Q. If you were to start all over again, what would you do?

A. When I started out, I had to make decisions based on incomplete information. It all turned out well, and I have greatly enjoyed my work. So, with the hindsight I now possess, I have no difficulty in saying that if I started all over again, I would do the same thing.



JUDITH M. HUGHES

PROFESSOR OF HISTORY

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Judith Hughes grew up in New York City, received her B.A. from Swarthmore College, and her M.A. and Ph.D. from Harvard. Judith came to UCSD in 1975. Listed among her professional writings are *To the Maginot Line: the Politics of French Military Preparation in the 1920s*, published in 1971; *Emotion and High Politics: Personal Relations at the Summit in Late Nineteenth Century Britain and Germany*, in 1983; and *Reshaping the Psychoanalytic Domain: The Work of Melanie Klein, W.R.D. Fairbairn, and D.W. Winnicott*, published in 1989. She will be teaching a new course on the history of psychoanalysis next year, as well as the popular *Twentieth-Century European Society and Social Thought*.

Q. How did being in college during the sixties' turmoil affect your outlook and choice of study?

A. Actually, I'm at the tail end of what I think of as the Second World War generation. My earliest political memories are of Roosevelt's death and hearing about the Holocaust. In terms of my formation as a historian, these had a decisive effect.

Q. Did you think that the study of history would help give you an understanding of how events such as the Holocaust could take place?

A. There was an intense curiosity, a sense that one had to know how it had come to pass and where we had come from. It wasn't enough simply to live in the present. I think the generation I'm talking about is still very historically minded.

Q. What are your special areas of interest in history?

A. When I began, one would say I was a military and diplomatic historian, but looking at those subjects psychologically or psychoanalytically. Then I shifted to interest in psychoanalytic theory, and I approach that historically. My present work is in the history of psychoanalysis.

Q. Are you finding a changing emphasis in the teaching of history?

A. I'd say there are two different kinds of

changes. One is that new subject matter comes to the fore and becomes the area where most people want to work.

Q. What are some examples?

A. Social history. A lot of working women's history. The whole question of gender. And gender leads to the next kind of change I see, which is change in analytic methods even within existing fields. There have been great shifts within Marxist history. There are tremendous divisions among people who approach problems in one fashion and people who think they should be approached in another fashion.

Q. What are some examples of the ferment?

A. There are the deconstructionists on the one hand and the contextualists on the other, for instance. In simple terms, the deconstructionists are concentrating on some kind of close textual analysis, as against seeing the text within a context that may be defined in terms of other people or larger political units.



You have to be interested in the students, in people of that age and what's happening to them. You need to feel it's worthwhile for them to learn the material.

Q. Does text necessarily refer only to written materials?

A. Not if you're a cultural anthropologist! Another change going on is the disciplines historians look to for theoretical tools. Twenty years ago they were looking much more to sociology and economics. Lately it's been anthropology. So shifts are going on, but I don't see any one trend emerging as dominant. This catholicity may be a good thing.

Q. What effect are the tremendous changes going on in the world during the past several months having on the historical outlook?

A. I teach the diplomatic history of Europe from 1870 to 1945. In 1945 things shut down, and that was the end of the story. Well, it's not the end of the story any more. I think what's been happening in Europe should be enormously stimulating to students. To have history happen so fast contradicts the general notion of the glacial pace at which things move.

Q. Does it call for a revision in the historian's outlook?

A. We'll have to rethink the shape of the twentieth century. Because it's turning out unexpectedly, we'll have to go back and reassess earlier developments. There will be a debate about Marxism—you see this in the daily press. You know, history is not written in concrete.

Q. What do you consider the principal value of history study today, particu-

larly for students who are not in the humanities?

A. Our student body is largely from California, and studying European history expands their universe. It gives them an opportunity to see where the United States has come from and where a good deal of our intellectual heritage and sense of world politics come from. It's a chance for students to break out of the confines of space and time they've been in, and I don't know how many chances like that they're going to get.

Q. What do you think makes a good teacher?

A. You have to be interested in your subject matter. In that sense, as far as your research interests can play into your teaching, it adds to the good. You have to be interested in the students, in people of that age and what's happening to them. You need to feel it's worthwhile for them to learn the material.

Q. What would you like students to take away from your classes?

A. I want different things for different levels. For the lower division, as I said, a sense of having broken out of their Southern California boundaries. The upper division I expect, or hope, will retain not only some of the information but also some of the analytic tools, some concepts and frameworks. I'd like students to come away with maps of topics covered which they could fill in in more detail if they want to do more. I'd like them to have the ability to use the tools to make their own maps in other courses. At the graduate level, I want to help the students find out what

projects they want to work on, help them on a one-to-one basis. The graduate level becomes much more of an individual encounter.

Q. Do you find that many pick up your interest in twentieth-century history?

A. In the recent past it didn't make much sense for them to go on with it because of the lack of jobs in the field. But things are changing.

Q. Are jobs opening up now for historians?

A. Things are expected to be considerably better in the 1990s. That means the people finishing their degrees by the late 1990s should be in pretty good shape in terms of academic jobs.

Q. What is your current research project?

A. I'm working on another book about the history of psychoanalysis. My last book was about Freud's British followers. This one will be about Freud himself.

Q. Reviewers have referred to your books as "vivid portrayals" and using "lucid, unstitled language." Do you write for the general public as well as for historians and students?

A. I'm not interested in a popular audience, although I work hard to write clearly. The books are written primarily for an interdisciplinary, well-read, well-educated academic audience. They're not just for specialists.



FLOYD GAFFNEY
PROFESSOR OF THEATRE

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Director Floyd Gaffney began his career as an actor-dancer, beginning his training as a teenager at Cleveland's famed Karamu House and with the Children's Theatre of the Cleveland Playhouse. He received bachelor's and master's degrees from Adelphi University in Garden City, New York, in 1959 and 1962, respectively, and a Ph.D. from Carnegie-Mellon University in 1966. He has long been associated with university and community theatres, and regional and professional companies. He has directed or choreographed many productions, including *Black Nativity*, *Ain't Misbehavin'*, *Boesman and Lena*, *The Blood Knot*, *Ma Rainey's Black Bottom*, and *Fences*. Gaffney has received the Andrew Mellon Fellowship in Drama, a Ford Foundation Grant, and two grants from the National Endowment for the Arts. He was a Fulbright Scholar in Brazil, and has traveled extensively to study international theatre techniques in Great Britain, Japan, and Africa.

Q. Prior to coming to UCSD, where were you teaching?

A. I taught at Ohio University's drama department and transferred to the University of California, Santa Barbara because there was a strong emphasis on the training of African-American teachers of drama there. I remained from 1969 to 1971, until I was invited to UCSD to assist in establishing its new undergraduate drama department. I became the second faculty member of the then UCSD Department of Drama, which is now known as the Department of Theatre. The first member was the well-known actor Eric Christmas (now professor emeritus). Approximately one year later, Arthur Wagner came to UCSD from Temple University, and soon after a graduate program was established.

Q. How has your teaching experience evolved at UCSD, and how did the Contemporary Black Arts Program come about?

A. I had a dual appointment for about five years with the Department of Drama, and I also taught in the cultural arts sequence that was offered through Muir College. The bulk of the students enrolled in the African-American sequence was from Third College, so it made sense to me to become a member of the Third College faculty. Subsequently, the present Contemporary Black Arts Program was set up and a minor study program was established. We've been in operation for eight years now. The program focuses on offering academic courses which relate to performance-oriented courses. Part of that structure involves bringing to UCSD performing and visual artists of national and international reputation. For the performance aspect, CBAP has invited



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While in the past most ethnic studies programs have focused on marginalized and, for the most part, underrepresented groups, the new department will strive to fully understand the dynamics that have shaped relationships among dominant groups and minorities.

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to campus a wide spectrum of black artists, including the late Earl "Fatha" Hines, the late Count Basie, the Bucket Dance Theatre from New York, poet-author Maya Angelou, jazz pianist Jay McShann, actress-director Ruby Dee, and the famed trumpeter Miles Davis.

Q. What are the academic characteristics of the Contemporary Black Arts Program?

A. In addition to the presentation of public events, twenty-four credits in theory, criticism, and literature are offered. The core of the program is made up of three lecture courses: drama (Introduction to Black Drama), literature (Development of Afro-American Literature), and music (Music of Black Americans). A fourth lecture course is also offered. A wide range of interests may be satisfied from this list, which offers introductory instruction in topics such as the black

ghetto, modern black drama, traditions in oral music, and the development of Afro-American literature. The final component of the minor evolves from a list of performance-oriented subjects, such as black theatre ensemble, gospel choir, jazz ensemble, or jazz improvisation. Several hundred students make up the ranks of the UCSD Gospel Choir, which each year delivers a Martin Luther King, Jr. Memorial Concert as well as its usual schedule of performances. In the past, nationally known gospel singers and popular local artists have sung with the choir, making the group a popular community attraction.

Q. Is there any special financial support for students of the CBA program?

A. Recently, with the help of fund-raising events by our Friends group, CBAP has been able to enlarge the scholarship fund. Three

\$500 scholarships will be awarded during the spring quarter to UCSD students enrolled in the Contemporary Black Arts minor program.

Q. Apart from the Contemporary Black Arts Program, are there any other academic programs for the study of non-white cultures?

A. At present, an ethnic studies department is being created within Third College. The department will make comparative analysis a fundamental component of the ethnic studies research and teaching agenda. While in the past most ethnic studies programs have focused on marginalized and, for the most part, underrepresented groups, the new department will strive to fully understand the dynamics that have shaped relationships among dominant groups and minorities. The department's emphasis, in the beginning, will be on the social sciences.





GEORGE SUGIHARA

PROFESSOR OF BIOLOGY
SCRIPPS INSTITUTION OF OCEANOGRAPHY AND
INSTITUTE OF NONLINEAR SCIENCE

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George Sugihara was born in Tokyo, Japan, in 1949, and his family moved to the United States when he was about two years old. Throughout his youth, Sugihara was engrossed with learning, not only from school, but also from the natural world around him. Becoming a scientist was something he seemed destined to do. As an undergraduate, he studied natural resources at the University of Michigan, and later earned a master's degree in biology and a doctorate in mathematical biology from Princeton University. During his college years, Sugihara won several academic awards and fellowships, including the Ogden Porter Jacobus Prize, Princeton's highest academic honor, and a citation for the best dissertation in the sciences.

From Princeton, Sugihara joined the Oak Ridge National Laboratory and simultaneously the mathematics department faculty at the University of Tennessee. His excellence in scholarship and research continued to be recognized by a long list of honors and

invited lectures at institutions around the world. In 1985, he returned to Japan, to become a senior research fellow with the Japan Society for the Promotion of Science and a visiting professor at the Tokyo Institute of Technology. Before leaving Japan in fall 1986 to come to UCSD's Scripps Institution of Oceanography, he was a visiting professor at Kyoto University.

Now from his office overlooking the Scripps Pier and the Pacific, Sugihara leads a multifaceted research program that applies the most sophisticated computer technology and cutting-edge theoretical mathematics to bring order to seemingly random and chaotic biological phenomena in nature. He spends his summers as a visiting fellow at the Imperial College in London and was recently appointed to the John Dove Isaacs Chair in Natural Philosophy at UCSD.

Q. What led you to pursue a career in science?

A. I have been interested in science as long as I can remember. I first became really serious about it as an undergraduate, more for philosophical reasons, however, than for a career. I came to see science as a powerful means of knowing the world. Science became a very personal thing for me, and I studied it very seriously. At the end of my senior year, I had the opportunity to enroll in a field program at the Woods Hole Oceanographic Institution in Massachusetts. It was a small project, but it was, nonetheless, my first practical experience in research, and it was later published with my faculty adviser. I found it incredibly exciting to be able to go beyond learning about what others have done—to actually discover something myself.





I am the kind of theoretician who likes to begin a problem by studying real-world measurements and data. Scripps has remarkable data resources. This is a very exciting interdisciplinary place, with world-class experts in many fields of environmental and earth sciences.

Q. How did you become interested in biology?

A. As silly as it may sound, my parents gave me an aquarium when I was in junior high school that I kept throughout high school. I became a fish fanatic. The more I learned about the fish I had and how to keep their twenty-gallon world running, the more I wanted to know. Also, we were lucky enough to have a small brook next to our house, which I kept stocked with fish.

Q. You specialize in an area of biological study that relies on mathematics to explain activities in nature. What is mathematical biology?

A. While taking courses in physics and chemistry, I saw clearly the central role that mathematics played in the development of those fields. I became convinced of its potential value in biology. Mathematical biology is actually a kind of biophysics, where mathematics is used as the major research tool. It is a way of using the very precise and powerful language of mathematics to explore biological questions. I believe the reason mathematics has not been traditionally thought of as a biological tool is partly due to the nature of the problems,

which are very complex, and partly because biologists typically take a rather dim view of mathematics. This is changing, and I think there are enormous opportunities in the field now.

Q. How does mathematical biology work?

A. One area I'm exploring now concerns applications of a new area of mathematics called fractals. Fractals are irregular and convoluted shapes having similar structure at different scales of observation, such as a snowflake, which has little bits that look like miniature versions of larger bits. Among other things, I am interested in using fractals to interpret color images of the ocean collected by satellites to see if there is a connection between the shape and size of biological patches and how long a particular pattern lasts. Eventually, we would like to be able to say something about the biological dynamics of the ocean over various time periods through interpreting satellite snapshots. Other areas involve using mathematics and computers to study the food web of an artificially acidified lake to understand the effects of acid rain and applying mathematical chaos to find predictability in biological activities we thought to be random. This latter

project has implications for forecasting things from disease outbreaks to plankton blooms.

Q. Is there any advantage to doing your research at Scripps Institution of Oceanography?

A. I am the kind of theoretician who likes to begin a problem by studying real-world measurements and data. Scripps has remarkable data resources. This is a very exciting interdisciplinary place, with world-class experts in many fields of environmental and earth sciences. I think that the potential to learn and collaborate in interesting and productive ways is better here than just about anywhere else.

Q. What recommendations do you have for undergraduates who are interested in studying marine biology or pursuing it as a career?

A. Some students might not want to hear this, but I would recommend the study of mathematics. The statement, "Mathematics is the language of science," is more than a cliché. In addition, I would recommend doing things that involve direct observation of nature, such as tidepooling. In the end, science should be fun. For me it is the best form of creative play imaginable.





CHANDRA MUKERJI

CHAIRWOMAN, DEPARTMENT OF COMMUNICATION

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▼ **C**handra Mukerji has been teaching in the Departments of Communication and Sociology since 1975. In 1989, she became the chairwoman of the Department of Communication, a bold and unconventional department housing perhaps the most diverse group of faculty on campus. Academic interests in the communication department range from video and film theory and production, international telecommunications and the revolutionary impact of new information systems in the workplace, to the effect of media coverage, television, public relations, and advertising on our culture.

Mukerji's own academic interests mirror the diversity of the department she leads. As a college student she studied film, then later, as a professor, branched out to study the sociological and cultural aspects of various other media. The political culture of seventeenth-century French gardens, the sociology of children's television, and the forms of communication between scientists and the state are some of her current areas of research.

In her busy, fifteen-year tenure at UCSD, Mukerji has also found time to contribute to

the academic community in various ways. She has served on personnel and recruitment committees for both departments and was a founding member of the Department of Communication who helped recruit many of the impressive faculty who constitute the department today.


Q. The communication department at UCSD is considered to be one of the most diverse departments within the social sciences. How would you describe it?

A. There is more interest in the relationship of communication to culture in our department than you would find in most other communication departments. In fact, of the communication programs that exist on the West Coast, we're the only department that spends a great deal of time analyzing cultural issues. This is part of the reason for our diversity. We have faculty teaching a variety of types of cultural analysis; we also attract primarily students who are interested in cultural analysis of the media.

Q. What are the characteristics of some of the students who major in communication at UCSD?

A. Many of them, interestingly enough, started out as biology majors. They took a look at biology and decided that it wasn't for them, then came to communication. We have a surprisingly large number of students with some background in the sciences. The campus is well known for the sciences, and many students come to UCSD in part for that reason. It is not uncommon for some of them to switch over to the social sciences—especially communication. We also get a lot of transfer students who want to come here to study media issues, because there really isn't another UC campus that has the kind of comprehensive program in media and communication that we have. Also, the majority of our undergraduates are women.

Q. Would you attribute the high number of women communication majors here to the progressive nature of the department?



A. I think that's part of it. There are a lot of courses offered in the department that deal with women's issues. So, I think women who are interested in these types of issues tend to gravitate to the communication department. But, I think it's also true that there are more women than men in the social sciences, with the exception of economics. Also, women who, in my generation, would have gone into literature, now go into communication. They can get the kind of cultural analysis that made literature attractive, but they can also get a more rigorous social science training that their parents like better. In addition to that, they have a sense that with a communication degree they can have a career in some aspect of the media. We tend to attract women with career ambitions.

Q. Wouldn't a communication major need some specific writing and technical skills to be competitive in the job market? Does the communication department offer anything along these lines?

A. We strongly encourage internships; in fact, most of our majors participate in internships outside of the university. Unlike most departments, we feel that this is an important part of their training here. They really need, as part of their education, to look at the world and to use their analytic tools from the major to make sense out of what's happening to them. Most students go to college and learn how to think, and then take a job and don't know how to use the analytic skills they've gained. We try to use the internship program to create a bridge between the two.

Q. Is communication a common major for would-be journalists? Does the department offer any specific journalism courses?

A. The UC system has always offered a broad, liberal arts education that is more

reflective, analytical, and abstract in nature than what you would find at a state or community college. The communication program is very consistent with this educational orientation. We don't offer vocational programs—it's not our role. We do, however, encourage internships which provide some real-world training. Journalists need to understand what's happening in the world around them, and they need some historical background so they can understand why things are happening. We do a good job of giving students the mental framework for this. We do offer some classes that could be considered more practical, too, such as a news writing workshop in which members of the local press participate.

Q. When you first joined the communication department, what issues did you become interested in?

A. When I arrived, I became interested in the development of mass-produced commercial culture. I started doing research on fifteenth- and sixteenth-century pictorial printmaking. I ended up writing a book on cultural changes in early modern Europe that were traced through pictorial printing, including things like maps, religious pictures, printed fabrics, and a wide array of pictorial printed objects. That got me interested in the whole literature on print in literacy. Most of what's written about printing discusses how literacy changes with the growth of printed books and how intellectual changes can be traced to the growth of literacy. I wanted to see how the mass production of pictures affected culture.

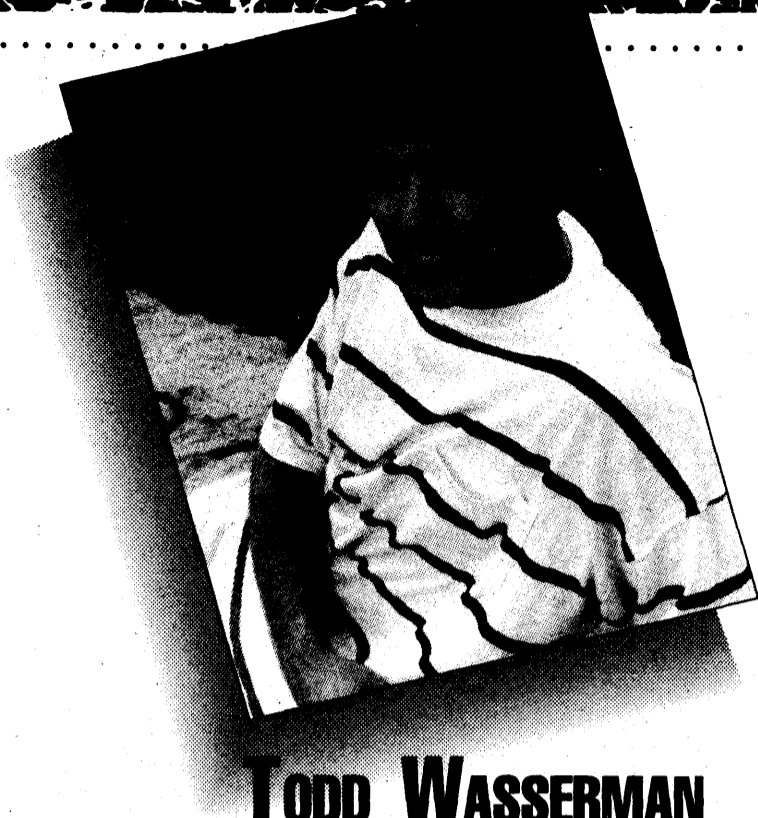
Q. What have you been studying recently?

A. I just recently did a book on science and communication which contrasts oral and written culture in the life of scientists and the way in which the relationship between science and the state is mediated through two

different kinds of communication systems. One, which is forgotten by scientists and is deeply political, is primarily an oral communication system; scientists give advice to the state on issues of political policy or weapons design. The other, which is written and always remembered and completely drained of political content, is the scientific literature in which scientists present research results to one another. More recently I've turned back to early modern Europe and I'm now writing about seventeenth-century French gardens. Again, I'm looking at visual communication, but I'm interested in the political culture, too, the way Louis XIV used gardens as a form of political communication, to communicate his power to the people. Formal French gardens were used as a form of state power, as an image of military, territorial control.

Q. Given your knowledge and expertise in communication, and as a parent, how do you feel about children's television and video games?

A. I think that certain TV programs like the "Muppet Babies" have educational value, while others clearly do not. But, a lot of the television that kids watched in previous generations was not particularly educational either. Video games like Nintendo have revolutionized leisure activity for kids. Kids seem to bond and socialize around Nintendo the same way kids used to bond and fraternize around baseball cards. I don't think baseball cards were particularly good for your mind and you're not losing a lot by replacing baseball cards with Nintendo. My guess is that boys are going to be less adept at math in the future and better at visual skills. The difference in boys and girls in math testing might be levelled if the world of sports statistics were to become less a male province in the center of young male culture.



TODD WASSERMAN
THIRD COLLEGE FRESHMAN

A nimal physiology major Todd Wasserman is a UCSD freshman who enjoys waterskiing and swimming as well as playing basketball and football. Nineteen-year-old Todd has three younger brothers and calls Beaverton, Oregon his home. His father is a dentist, his mother a substitute teacher--they are both UCLA alumni.

Q. As an out-of-state student, why were you interested in attending a university in California?

A. Originally, I applied to several UC schools: San Diego, Los Angeles, and Berkeley. My parents both attended UCLA, so I've heard about the UC system all my life. I also was planning to apply to the University of Oregon, but there was really no reason to pursue it once I was accepted here. Ironically, it turned out that I didn't even apply to any schools in Oregon.

Last spring break, a friend and I drove down from Oregon to visit UCSD and several other colleges. I was impressed with the campus, but that was only one of the reasons I decided to come here. UCSD was strong in the sciences. I wanted to study biology to get prepared for medical school, so UCSD was perfect in that regard.

Q. During your visit, what struck you about the campus that you liked?

A. Location, obviously! You've got great weather and a nice looking campus. I was impressed with the growing school, and felt the campus itself was beautiful.

Q. Was it difficult to adjust to college life?

A. Yes, it was tough, especially the first quarter. You have to go through a whole new process of making new friends, meeting new people, and establishing a new identity for yourself. You also have to get used to being away from family. It was nice to be away at first, like a good vacation. But, no matter how much you may think you won't, you *do* miss your family.

Q. How did you handle that?

A. The phone bill was *real* high!

Q. Third is known as a progressive college, always keeping pace with the changing times. Why did you choose Third College?

A. I had in front of me a list of the general-education requirements for each college, and that's basically what I used to make my decision. I was choosing between Revelle and Third. Revelle seemed a little bit too structured for me. They both were strong in the sciences, but I thought there was a little more flexibility in Third's curriculum. Now that I'm here, I think that I'm kind of lucky.

Q. Have you found a way to extend your education beyond the classroom?

A. I've already started working in a lab at the UCSD Medical Center, which is ten miles away in Hillcrest [uptown San Diego]. It's really no problem to get to, because there's a shuttle service provided by the campus that leaves every half hour. Even though it's a large campus, the shuttle system enables you to get where you want. And it's free. There are also electric carts to help disabled students get across campus.


Q. How do you go about selecting a course or instructor?

A. I use the *CAPE* (Course and Professor Evaluations) booklet. It's an analysis of the classes and the professors done by the students themselves. They sell it at the bookstore for \$1. It compiles all the students' opinions, and marks down how many people have that same opinion. From what I've seen, it's pretty accurate. In fact, I picked most of my classes for this quarter by reading the *CAPE*.

Q. What's it like studying under a ten-week quarter system?

A. You have to be on the ball. You can never slack off with your studying. You've got one mid-term, and two or three weeks later there's the next one to take. Then you've got your final coming up, which also happens a lot faster than you expect. So, you're always studying. It's a good system because it forces you to do





what you need to do. It's really impossible to let up on the work.

Q. To whom do you turn when you need help or assistance on a project?

A. Friends are always the best bet—especially for getting a small group of four or five people to study together. Other than that, I've stopped in to see my adviser once or twice.

Q. How do you get a study group together?

A. We really don't 'get it together'—it just seems to happen. You find people who have classes in common with you, and you start studying with them. We'll do our labs together the night before, or study for a mid-term by going over practice exams.

Q. As a student, do you affiliate more with your college or the larger university? In other words, do you feel part of one university, or do you feel more like a Third College student?

A. No, I don't feel like a 'Third College' student. I've had classes all over campus, and I know my way around. I don't feel confined to Third at all. I've had classes at Reville, Muir, and over by the Price Center.

As far as the interaction among people, the colleges aren't separated at all. The only things different about the colleges are the architecture, the location of the dorms and the general-education requirements. We are all able to take the same classes, which are offered throughout the campus. So, the colleges don't seem separated at all.

Q. Third is known for its cultural events and programming. How do you get involved with activities on campus?

A. A lot of my friends happen to be Asian. They're involved in the Chinese and Korean-American student associations, and I've gotten

introduced to some groups through them. They take me along to dances, which are fun. Personally, I don't plan on getting involved politically. That's not one of my interests.

Q. You're living in Third's new residence halls. What are they like?

A. They're great dorms—new dorms! The rooms are on the side, with a meeting room in the middle that's like a family room. The floors are coed, the guys on one side and the girls across the hall. I really like the way they're designed because all the dorms are close together. It's nice. You don't have to worry about going over to the next building, you just walk across the hall. We have people dropping by all the time.

The modern architecture also appeals to me. The Third College dorms are centered around a sand volleyball pit, and a basketball court is nearby, too. It's a popular place for people to relax.

Q. How do you stay in shape?

A. I keep myself in shape by running and swimming. There are two pools on campus. The Canyonview pool is great. It's a huge outdoor pool, and I like swimming out in the sun.

I was thinking seriously about going out for the swim team. I have the desire, but not the time. I wanted to concentrate more on academics. I think it can be done, if you want to become involved in a sport and you're serious about it. I went to see a water polo game and it was really good; it surprised me since UCSD is a Division III school.

I also love to water ski. I know Mission Bay has a lot of water sports and games available. Unfortunately, I haven't gotten down there yet.

Q. What are your favorite campus spots?

A. This quarter it's been the library. There's a big grassy area out at Third. Some people

would probably find it distracting, but I like sitting out and reading or studying at the same time. There's also a small park with benches behind the Price Center. I like to study there because it's kind of secluded.

At night, I like to go to Espresso Roma. When I'm hanging out at the library and it gets to be 9:30 p.m. or so, and I'm getting drowsy, I just walk over and get coffee into my system. The cappuccinos are really strong, but they do the job. A lot of people go there at night. They also have pastries and croissants. It's a popular place to go and wake up.

Q. Is there something about the campus that stands out to you?

A. I hate to be simplistic, but coming from Beaverton, Oregon I just enjoy the weather. Right now I think we're having snow back home, but you can always count on the weather here. I find it hilarious when people complain about it getting cold at night when it dips into the 50s.

But, in spite of its location, UCSD is not a 'surfer school' or a 'party school.' Students take the weather in stride. They are really dedicated to their work. I've noticed that a lot of students here buckle down, and they get what they need to have done *done*.

Q. How did you handle the pressure to choose one school?

A. I handled it the only way I could—I ignored the pressure from other people and I made my own decisions. You have to, because you have to be happy with where you're going, not where your parents or anybody else want you to go.

You've got to look at location and the school's reputation. But, most importantly, if you get the opportunity, talk to people on campus. Before making a decision, talk to people. See if they're the kind of people you want to spend the next four years with.



AGUSTIN OROZCO
MUIR COLLEGE SOPHOMORE

Auggie Orozco, nineteen, is the youngest of nine children. His home is Spring Valley, a San Diego suburb. A Spanish literature major, he is an active Associated Students senator, student advocate for undergraduate diversity, and MEChA member. Auggie is the founding chairman of the Muir Cultural Society, serves on the Muir College Council, is an orientation leader, and a campus tour guide. His father is a retired construction worker and his mother a retired seamstress.

Q. You're very involved on campus, particularly as a senator in student government (Associated Students). Has this experience given you a "bigger picture" of UCSD?

A. Yes, I think so. Through AS I deal with a lot of campus-wide issues. Also, as an AS senator, I sit on my college council, where the issues are Muir-specific. There is so much room here for involvement and to be a part of the community—to be a part of change. There are over 230 organizations on campus, and I see that as very special.

Q. One of UCSD's most unique features is its five-college system. What are the advantages of this arrangement?

A. It's more personal. Here, the campus is set up in little sections, by college. For example, each college has its own dorms or apartments. Also, people are more accessible. When it comes to academic advising or talking to your provost or dean, you're dealing with people you already know. You get more of a feeling of home.

Q. Why did you choose Muir?


A. I liked the fact that I had a choice about which general-education requirements I could take. Also, I could establish more breadth and depth in my class selection. I had a choice between Spanish and theatre, or anthropology and sociology, or biology instead of math. I liked the fact that I could pick the classes I wanted to take, whereas if I were at Revelle the choice of classes would be more structured and specific.

Q. Muir's general-education requirements are highly flexible. Does this notion of shaping your own academic program place more responsibility on you?

A. Yes, because it makes you pick the classes you take. It's not laid out for you—you have to lay it out for yourself. There's also a program called Muir Special Project, where you can design your own major by selecting a group of courses with an adviser.

Q. Are there any features of Muir's curriculum that stand out?

A. I took a writing class called Muir 50, which gave me a choice of what books I wanted to read or what films I wanted to watch. We compared Shakespeare and the TV series "Moonlighting." While the class is a requirement, there was still room for choice. Muir lets you do something you like doing, and that way you'll do better at it.



.....

When it comes to academic advising or talking to your provost or dean, you're dealing with people you already know. You get more of a feeling of home.

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Q. You're involved in several campus organizations (Student Advocates for Undergraduate Diversity, MEChA, and the Muir Cultural Society), many of which are concerned with social issues. Do many students here share your concerns?

A. Not all students, but many are aware of social issues. To keep themselves informed, students should follow the campus papers, such as *The Guardian*. It does an article every week about AS meetings. The *AS Bulletin* also reports on campus issues. Another way is listening to KSDT radio. Students should also attend AS meetings, which are always open to the public. There are forums set up to debate current issues.

Q. From your perspective as an AS senator, how would you describe our student body?

A. It isn't as spirited as, say, UCLA, but if there's something the students feel is important they will rally together to meet a common goal. For instance, last year we passed a referendum for a constitutional convention. Students will pool together when they feel there's an important issue and when they feel others are listening.

Q. What are the keys to being successful at UCSD?

A. Students must be able to balance academics with their social life. Time management is a big factor. Knowing when to say 'enough is enough' and 'I'm going to start studying.' Sometimes you have to say, 'I can study for two hours, go to my meeting, and then come back and study some more.' I think it's very important that students know their limits.

Q. What resources do you turn to when you have a question about your homework?

A. If it's a class-specific problem, then you may turn to your teaching assistant or professor. When I have problems with my math homework or my papers, I go to OASIS, the tutoring center. They have the Writing Center, tutors for math and science, and workshops to improve study skills and time management.

In general, students are always willing to study together, especially during mid-terms or finals. Studying together is very important, because you get to hear someone else's perspective. When you share your ideas, it makes for a better paper. If it's math, it's always better to check over your work and follow the steps with someone else.

Q. Tell us about some of the campus events you're involved with.

A. There are many opportunities for getting involved. This year the AS is hosting its first annual Culture Quest. It's a cultural festival.

Last year I was involved with MEChA's Cinco de Mayo festival, which is always great.

This year MEChA had a high school conference, and it was great to see it come together after months of planning.

Q. What do you think made UCSD the right choice for you?

A. I read the general-education requirements in the *UCSD General Catalog*, and everything was very positive. I liked it. It felt very homey. I received letters from my college adviser, and she made me feel welcome. The people here had open arms.

Q. After nearly two years as a Triton, have your views of UCSD changed?

A. A lot of people in San Diego see UCSD as 'the school on the hill.' Because it's in La Jolla some people think it's a ritzy school where everyone drives BMWs. Coming here, I see that's not the case. There's actually a mix of students here. The campus is diverse, but we still need to do more to attract more students of color.

On a more personal note, I was afraid that the classes were going to be hard and that I might not be able to make the grade. That fear quickly went away, because once you're here you get used to it. You get used to the lectures, the class size, and how the professors teach.



SAMARA BLOOM

REVELLE COLLEGE SENIOR

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The second oldest of five children, Sam Bloom is the only one who chose not to attend Dartmouth College. After a year at William and Mary College in Virginia, she transferred to UCSD. She is an avid sports participant, playing intramural basketball, water polo and volleyball, and intercollegiate softball and lacrosse. A biological anthropology major with a minor in visual arts, Sam, twenty-two, has served as teaching assistant for a biology/anthropology conservation class. She lives at home in La Jolla, where her father is a physician and her mother a free-lance interior designer.

Q. First you went to William and Mary, a small private college. What prompted you to transfer to UCSD?

A. The choice of courses and curriculum at William and Mary was too small. I knew at UCSD I could come to a school in a good location where people have high esteem for your physics and chemistry departments.

Q. Why did you choose Revelle?

A. I understood it from the point of view that each college had a different set of core requirements. In high school you get a really limited view of what's out there. The Revelle curriculum requires you to take a variety of subjects and I thought it would be good to get an all-around type of education before moving on to graduate school.

Q. How have your studies at Revelle changed the way you view the world?

A. At Revelle, you see what's out there, and you come to know a lot more about the world. The general-education requirements include courses in the humanities. You read the classics.

But, the most important thing is that the Revelle curriculum includes classes from almost every discipline. I didn't know there were so many opportunities. At first, I didn't want to take any social sciences, but after taking one anthropology course I made it a minor, and last year I changed my major to anthropology.

By going to Revelle, you're expected to learn about a variety of things.

Q. How would you describe the faculty here?

A. Most are very helpful. If not for the fact they were so interested in helping me, I don't think I would be in my major today. Most members of the department were interested and involved, and it shows in the classroom. My professors are very accessible, the kind who always have their doors open, regardless of office hours.

Q. If you need to ask a question, how do you approach your professor?

A. I'm really shy, so they ended up approaching me. I'm in an honors thesis program because I was invited to write a senior thesis by Professor Shirley Strum [an international authority in anthropology]. In fact, I visited her during her field studies in Kenya.

It was an interesting experience, being so far from home and being out with the baboons. Six, seven, ten-hour days of hiking and things like that. I got a true feel for the work.



Intramurals are great too. This school has one of the best intramural programs I've ever seen. And you meet so many different people, especially the more you play. That's originally how I made most of my friends.

Q. What was it like studying with someone so well known?

A. Nerve-racking. You learn a lot of things, because she has so much to say.

Q. How important is diversity on a campus to you?

A. I think a campus should be diverse, because in my small high school I didn't have that type of learning experience. I want a broad education from college, and that's a part of it.

Q. What qualities have helped you succeed at UCSD?

A. Just a desire to learn. I would really like to take *one* course in *every* subject, just to see what it's like. I'm more interested in learning things than competing with everybody else.

Q. What resources do you turn to when you need help or assistance on a project?

A. I'll usually talk it out with friends first, if they're involved. Or I'll go to the library and talk to the reference librarians, because most of them are more than willing to help. And then, if I'm really stuck, I'll go to the teaching assistant. In anthro, they almost beg you to come in, so it's easier knowing that they want to talk to you.

Q. Getting away from academics, how do you blow off steam?

A. I relax by playing intramurals. You just have to find something to do that's outside of your studies.

The intercollegiate sports [Samara played softball and lacrosse] were a very good experience because you're with the same people four hours a day, and then you travel. It helps you learn how to get along with a diverse group.

Intramurals are great too. This school has one of the best intramural programs I've ever seen. And you meet so many different people, especially the more you play. That's originally how I made most of my friends.

Q. If you were going out on a Friday or Saturday night, what would be a couple of your favorite choices?

A. There are interesting places downtown. You can go to good movies at the Ken or the Guild [both exhibit art films]. I like to go to sporting events. There's also a lot of music in San Diego, like the symphony and live bands at the Bacchanal and Belly-Up [area clubs]. La Jolla at night is an interesting place to walk.

Q. When choosing between two or three colleges, how do you make a decision that's right for you?

A. I don't think you really know what's right until you actually get there. I tried it at William and Mary for a year and didn't like it. I was more interested in a broad general education, and a larger university like UCSD offers that kind of education. So, I made the choice and decided to come here.

Q. How much of your decision was based on your desire to attend graduate school?

A. That was an important aspect. UCSD was respected in the sciences, and I was originally interested in chemical physics. I'm applying to grad schools now, so we'll see how much UCSD has helped me.

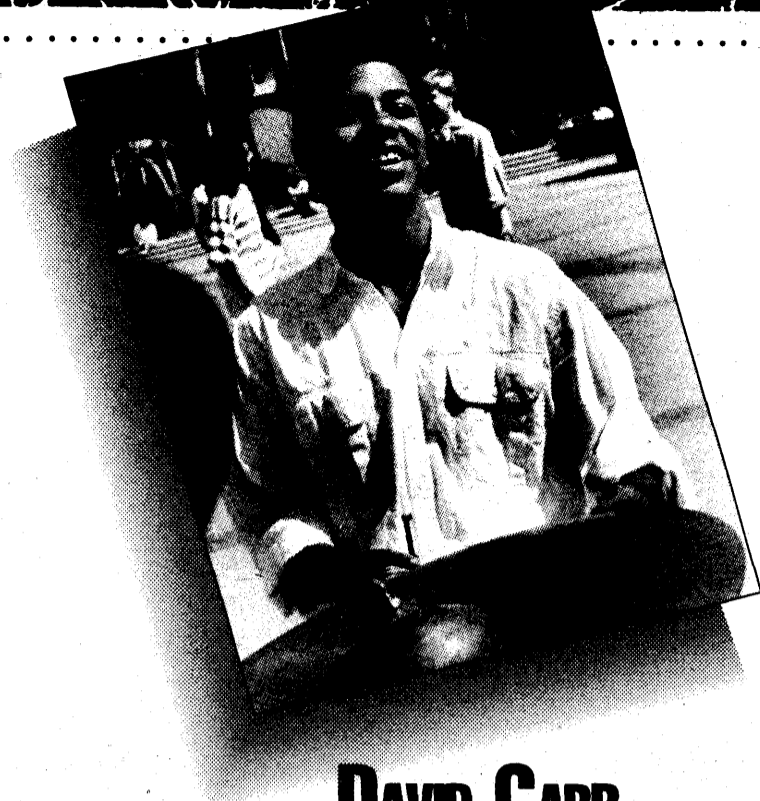
Q. What tips could you share with a student who's about to transfer?

A. I think UCSD is an easy school to become a part of. There are a lot of organizations you can get involved in, and once you take that first step, everything else seems easy. Whether it's just meeting people in your classes or joining some organization, UCSD has a program that's going to help you integrate yourself.

Q. What has been your best experience at UCSD so far?

A. You might say that my best experience was finding that I was interested in something other than the hard sciences. I realized that I wasn't going to be a doctor, like everyone thought I was going to be.

Having an opportunity to take a variety of classes gave me a good perspective on who I was and what I was really going to do. It was a good experience getting into the anthropology department, where people are interested in your work and want to help you.



DAVID CARR

FIFTH COLLEGE SOPHOMORE

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Nineteen-year-old David Carr, who sings lead vocals in a progressive hard rock band, hails from San Pedro, California. Although as a sophomore his major is undeclared, he has an interest in literature and writing. David has one younger sister, his father is an electrical equipment salesman, and his mother is a scientist in a cytogenetics lab.

Q. When you were looking at colleges, what attracted you to UCSD? Why did you choose to enroll here?

A. Actually, UCSD was not my first choice. But, when I received my acceptance I was pretty excited, and I liked a lot of the material they sent to me. The whole idea of having the university split into five different colleges—I had never heard of anything like that before.

So, my interest was piqued, and then I was sent letters about the campus and invited to an informal luncheon with other families at Fifth College. Basically, the more I learned about the university, the more interested I became, until I finally decided that this was where I wanted to go.

Q. What other schools were you considering?

A. UC Irvine, UC Santa Cruz, and UC Riverside. Generally, other UCs.

Q. You were one of Fifth's first students. As UCSD's newest college, its image is just taking shape. What were some of the reasons Fifth College was attractive to you?

A. The main thing that attracted me to Fifth College was that it was the new college on campus. I wanted the experience of being one of the first students to attend this new college. Personally, I didn't feel a strong need for an international education, but I'm glad I've been exposed to it. I've learned a lot about what has gone on in the world and what's going on now. Before I enrolled in Fifth, you could say I was pretty closed-minded about the world. My world was San Pedro, and that was it.

Q. Fifth has a special six-quarter class called *The Making of the Modern World*. How has it affected your perspective on the world?

A. I'm excited about the class. It definitely tries to open your eyes and mind to what has gone on in our world, how we've developed and how we've come to be where we are. I like the fact that we study different cultures to see what we have taken from each and integrated into our own.

Q. What about class size?

A. You usually have lectures three times a week, which are fairly large, and then a section either once or twice during the week. The sections are usually smaller, and generally the section leaders do a good job in making the lectures more accessible.

The TAs (teaching assistants) have office hours and they're usually available. Most of the time they will give out their home phone numbers, if you need more help.

Q. How do you feel about taking a class with 250 other students?

A. It can be overwhelming, but I've learned to deal with it. You learn what to do and what not to do. You don't sit way in the back of the lecture hall; instead, you try to sit as close as you can to the lecturer so you can absorb everything that is going on, everything he or she is saying, everything that he or she is writing on the board. You learn tricks like that—sit up front, maybe ask questions during the lecture or after, so the professor will remember who you are. Most of my other classes are a lot smaller, usually fifty to sixty people.

Q. How would you describe the pace here?

A. I'd say the academics here are very rigorous, very tough. You have to keep on top of what you're doing; you can't slide. You definitely have to make the effort here, because the profs and TAs aren't going to make you read. They'll let you know that you should be reading, but no one's here to force you.

Q. Now that you're here, what resources do you turn to when you need help or assistance on a project?

A. I usually turn to OASIS, the tutorial center, because it's definitely one of the best organizations on campus for academic aid. I go there when I'm assigned a paper to make sure that I'm on the right track. It's been really helpful.

Some classes, like Modern World, are ones you can't study for alone. I think the best way to study for an exam in that kind of class is to get together with other students. We're all in the same boat, so we should help each other. It's very easy to find students at Fifth who will help you study for an exam.

Q. The international side to Fifth College is very intriguing. What are some of your college's activities?

A. One of the activities that shows off the international flavor of Fifth is the Cinco de Mayo festival. It showcases Mexican food and culture. We also had an international festival, in which all the dorms picked a certain region or country. Some represented Russia, Japan, Africa, and China. It was really interesting, because not only did they serve food and decorate the place, but they also gave some cultural facts about the countries. It was a pretty cool eye-opener.

Q. UCSD is a big place. How have you

managed to meet people and establish ongoing friendships?

A. Summer Bridge helped, and I've met people in classes, too. I've also found that people will just talk to you for no apparent reason, other than maybe they're lost—or maybe they just want to know who you are. It's really not that hard to meet people.

When you're in your college, there's a bond that forms. You're either Fifth students or Muir students, so it's easy to meet people in your college—maybe a tad more difficult to meet people from the other colleges, but that becomes easier with time.

Q. What about the Price Center?

A. It's a good place to meet people. I like the special programs. They have a *Thursday on the Green* [a series of outdoor concerts] with a band playing, which I like.

Q. Occasionally, we hear students say that there isn't enough to do on our campus, especially on weekends.

A. I've heard that too, and for the most part it's a false statement to make. I think there is a lot to do on campus.

I've attended a lot of functions sponsored by the African-American Student Union and the Mexican-American organization, MEChA. I've enjoyed those. I've also participated in intramural sports, which I think are great. Generally, I think there are a lot of good activities. Maybe I grew up in a weird environment, but I think there's a lot to do here.

Q. Is it difficult to get off campus without having your own car?

A. I usually go off campus with friends of mine who *do* drive, either to the beach or to the movies or maybe to a concert. Most of the time we go to a nearby shopping center [University

Towne Centre], which basically tends to be 'on campus' if you go often enough. I've also gone to the city of Bonita, North County Fair, and around the San Diego Sports Arena. But, for the most part, we stay closer to this community, and go to places in nearby University City and La Jolla.

Q. Our black population is a very small group when you look at the overall population of the campus. Has that been difficult for you here?

A. It hasn't been difficult, but I feel more needs to be done in getting more black students to UCSD, or to universities in general, especially during the first two years of high school. I feel groups like the African-American Student Union (AASU) has done great things to build up black pride and black achievement here. I love a lot of the programs they've sponsored.

Q. Some of the students who will read this profile may be in your shoes next fall. Can you share any tips to get students started on the right track?

A. Go to class. Read what you're supposed to read. Do it. Don't try to put it off. If you do put it off, make sure you get caught up with it because it will haunt you when it comes time for mid-terms or finals.

When you have trouble with something, *ask somebody*—whether it's a roommate or a neighbor or the TA or the lecturer. Ask them!

Get involved in some of the organizations on campus, like AS, AASU, or MEChA. If you're into sports, try our intramurals—join a team in football, baseball, or basketball. Get involved!

There's a lot of work here, but you can do it and still have a good time.



MARIA (LIZA) GRAPILON
WARREN COLLEGE SOPHOMORE

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Biochemistry major Maria (Liza) Grapilon, nineteen, and her younger brother, a freshman, commute to campus from Imperial Beach, near the Mexican border. Liza is Warren College's commuter intern, student health advocate, and an orientation leader. Her father is a retired Navy aircraft specialist, her mother a UCSD Medical Center diet technician.

Q. Why did you choose UCSD?

A. I could have gone out of state or to a different university, but I didn't want to leave home yet. I wanted to feel my way first, and UCSD was great because it was within commuting distance.

Also, it has a great science program, and I'm interested in going to medical school.

Q. Originally, you were interested in UC Berkeley. What differences stand out to you between our campus and Berkeley?

A. To me, they're both the same thing: a UC school. People may say, 'Berkeley's better,' but I don't think there's much of a difference. And UCSD is a lot more convenient for me, what with the population, the selection of core courses, and the weather.

Q. After you became familiar with our college system, how did you go about choosing Warren?

A. It was really a tough decision, but I liked Warren College because it seemed to emphasize a link between a career and your choice of classes. Once I was in the college, I was quite impressed by its flexibility compared to the other colleges.

It has the three general-education branches. You have a major, plus two programs of concentration. I think that's really great because it's well-rounded. You choose what classes you want to take; you can take what interests you.

Q. What subjects interest you?

A. I'm taking classes in the visual arts. I picked art history to fulfill my fine arts requirement. I've always been fond of art, especially European art history, but I was kind of naive. I didn't know many techniques or styles.

At Warren, I can get a better, broader understanding and look for those nuances an art lover should look for. I'd really like to

understand why one work is a masterpiece, and why another is not.

Q. Are you planning to take part in the Academic Internship Program?

A. Yes, I plan to get involved when I'm a junior. I'd like to intern with a doctor, work in a hospital or a laboratory. Next quarter I'm taking part in the Career Services "Career Exploration" program. I'll be working with a research assistant over spring break.

Q. One of Warren's unique requirements is its Ethics and Society course. How has it broadened your education?

A. It provides a good, broad exposure to a lot of ethical questions and moral dilemmas, such as abortion, euthanasia, and professional ethics. The emphasis is on issues that professionals may encounter.

I thought I knew my positions on issues like abortion and legal ethics, but now that I've read the literature the issues have become a lot more nebulous. There are still a lot of vague, fuzzy questions in there. Everything's not just clear-cut, black-and-white. I think the course

I t has three general-education branches. You have a major, plus two programs of concentration. I think that's really great because it's well-rounded. You choose what classes you want to take; you can take what interests you.

will stick with me and make me a little more sensitive to the questions that controversial issues can raise.

Q. How would you describe the pace here?

A. It's very intense and very fast. Before you know it you've got your new classes and you're taking your mid-terms already, and by the time you've finished your mid-terms you're signing up for the next quarter. There's really no let-up.

Q. What has been your experience with class size?

A. Most of the professors can handle a large audience. Plus, most of the big classes have sections, and I always go prepared to ask questions.

My organic chemistry class has been my largest, probably close to 400 students. It's distracting. You want to arrive early to beat everyone else to a seat. If you're late, you have to settle for sitting on the floor.

Q. Describe your adjustment to college life.

A. I think it was pretty easy, because it wasn't much of a change. I still live at home. The difference is I have to spend a lot more time at UCSD during the day. At times I have hour-long gaps between classes or activities, so I have to budget my time. I try to study during my breaks, or use the time for meetings or lunch.

Q. As a commuter, is it easy to take part in campus activities?

A. The first year was pretty tough. It's not like high school, where they guide you by the hand. As a commuter student you really have to take the initiative to get involved and make friends, because it's so hard if you're just going to go to class and go home. If you're not a part of the whole atmosphere, it's difficult to feel welcome at UCSD. You have to make the effort.

As Warren's commuter intern, there are a lot of activities that I help plan. We have commuter breakfasts, sponsored by different colleges on different days. At Warren they're on Tuesdays and they're only \$.50. Everybody's welcome. It's a good way to get updated on commuter activities, as well as college news. It's also a good way to meet other people. And it's a good way to fill up your stomach before going to class.

Q. As a San Diegan, you probably know a lot of good spots to visit. Where do you like to go?

A. I like to show off the city to new friends. Mexico is a great place to go shopping and experience a different culture, and I enjoy going to Balboa Park, Horton Plaza, and the beach.

Q. Do you have a favorite campus spot to study or meet people?

A. The Price Center is the best spot. It has a nice cafe atmosphere with outdoor seating where you can relax and eat. There's always something happening in the plaza.

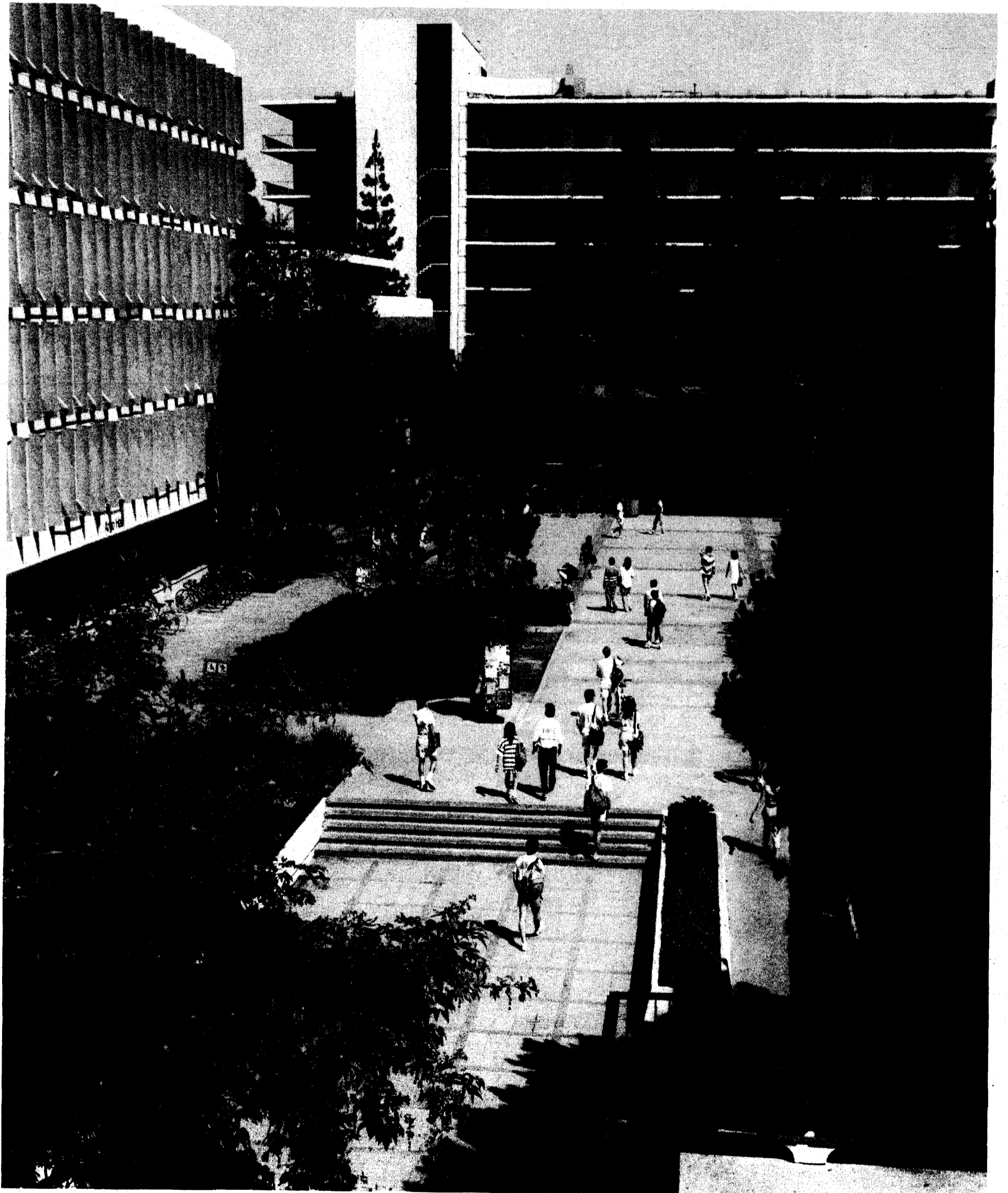
Q. What advice could you offer students undecided about their major?

A. At first, I wasn't sure which way I wanted to lean. I changed my major once, because I didn't know what it entailed. People who are undecided, or feel their decision is now or never, should realize there's so much time to plan. They can always take the general-education requirements first, and sample different classes to make sure they really want a particular career. The Career Services Center is always available to help make those kinds of decisions easier.

Q. Is there something about our campus that would make you want to go out and tell your friends, 'Hey, you should really come on by'?

A. I like the variety on campus. Most people here are pretty accepting of others. There's no problem being unique. You can dress however you want; you can act however you want--I like that tolerant atmosphere.

Also, you get the best of both worlds--you get the small college atmosphere, but can still branch out into the all-campus side of UCSD.



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 Campus

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. Students have the option of undertaking one or more academic internships during their junior or senior year. Students must have completed ninety units, including some upper-division course work, and have at least a 2.5 G.P.A. 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: 8004 Humanities and Social Sciences Building, Muir College

Professors

F. G. Bailey, Ph.D.

Roy G. D'Andrade, Ph.D.

David K. Jordan, Ph.D.

Robert I. Levy, M.D.

Michael E. Meeker, Ph.D., *Chairman*

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 Professor

Fitz John P. Poole, Ph.D.

Assistant Professors

James Moore, Ph.D.

Jennifer E. Robertson, Ph.D.

Marcelo M. Suárez-Orozco, 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 how the diversity of cultural traditions and social institutions issues from frameworks of behavior and experience which all peoples have in common. With the increasing awareness of the importance of socio-cultural 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.

At UCSD, the concentration is on cultural, social, and psychological anthropology, with theoretical emphasis on such topics as religion, identity, social systems, politics, the family, and—to an extent that is unusual among anthropology departments—cognitive and personality psychology. Courses are also available in primatology and physical anthropology. Courses utilize a comparative perspective, drawing on materials from a wide variety of cultural settings throughout the world. Some courses also focus on specific societies or parts of the world. 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, AN 10, 11, 12 and AN 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 AN 22, which is the prerequisite for most upper-division courses offered by the department.

Students who have already completed AN 105, 106, and 107 may not receive academic credit for AN 22.

Other lower-division courses are offered from time to time and will vary from year to year.

THE MINOR

Students may choose either a general anthropology minor or a minor in 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. AN 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 (AN 187A, B, or C) with the corresponding Academic Internship project (AIP 197). However, this exception does not extend to AN 105, 106 and 107, or to transfer credits accepted in lieu of them. These **must** be taken for a 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 AN 105-106-107 sequence considered separately.

5. At least seven of the upper-division courses submitted for their major must be taken at the University of California, San Diego. The seven normally must include AN 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 BIOLOGICAL ANTHROPOLOGY

The department offers another B.A. degree, "Anthropology with Concentration in Biological Anthropology." This degree requires the following:

1. The Core Sequence, AN 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 AN 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 chairman 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. All interested students should apply to the department's undergraduate adviser by the end of the sixth week of the 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 internship experience in (1) physical anthropology, or (2) ethnology and archaeology at the museum, or (3) in 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 (AN 187A-B, or C) 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 chairperson 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 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
(four units each)

281: Introductory Seminar (four units)

282: Ethnological Issues (four units)

230A: Departmental Colloquium
(four quarters, one unit each)

261: Bibliographic Resources in Anthropology (one unit)

295: Master's Thesis Preparation
(one–twelve units)

500: Apprentice Teaching
(two quarters, one–four units each)
(See below, "Teaching.")

2. Students must take four letter-grade elective seminars in the department from at least three different faculty members. Required courses may not be counted as elective seminars.

3. The Master's Thesis

Upon completion of the specific courses and four elective, letter-grade seminars, the student may be advanced to master's candidacy (normally at the end of winter quarter of the second year). Upon advancement to master's candidacy, a master's thesis committee of three faculty is appointed by the dean of Graduate Studies. The thesis, normally written during the winter quarter of the second year, must be approved unanimously by the student's master's thesis committee and accepted by the University Librarian.

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 seminars plus Anthropology 283: Ethnographic Field Methods or the equivalent in independent study directed by the student's doctoral committee.

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 chairperson, 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 affilia-

tions 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 chairperson of their doctoral committee before registration for the winter quarter of the third year. The chairperson of the doctoral committee serves as the student's adviser for the remainder of the student's program. In consultation with the chairperson 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 prefield oral qualifying examination. The dissertation research proposal sets forth a specific plan of research, normally involving intensive fieldwork. AN 296A,B provides 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. The oral qualifying examination 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. A resume 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

An evaluation is made by the faculty in the spring quarter of the student's first year, and at the end of the spring quarter of the student's second year to determine whether the student should continue in the program, based on the student's performance in seminars and other course work. A written progress assessment is given to the student after each evaluation to help the student assess his or her progress.

TEACHING

In order to acquire teaching experience, each student in the graduate program is required to participate as an assistant in the teaching activ-

ities 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 "AN 500: Apprentice Teaching."

COURSE REQUIREMENTS

Only one 290-level course may be taken in any one quarter until a student attains Ph.D. candidacy. Students are encouraged to take an independent study course taught within a tutorial framework prior to the master's exam.

INTRODUCTION TO REQUIRED COURSES

AN 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.

AN 281: Introductory Seminar. This seminar is held in the first quarter 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. In addition there will be readings (mainly but not exclusively of books or essays produced by the speakers). Two weeks will be set aside for integrating discussion.

AN 282: Ethnological Issues. An examination of special anthropological issues and problems which have arisen out of ethnographic work in particular regions of the world, e.g., the "potlatch" of the Pacific Northwest, the "cargo cults" of Melanesia, etc. Issues will vary from year to year.

AN 283: Ethnographic Fieldmethods. An opportunity to use several main fieldmethods of social and cultural anthropology and to discuss their strengths and problems. Includes the genealogical method, various types of interviewing and observation, oral history, and maintenance of fieldnotes and indexes.

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. All students who are interested in the work of the Melanesian Studies Resource Center and Archive should contact Fitz John Poole or Donald Tuzin of the Department of Anthropology, who are the co-directors of these projects.

Courses

NOTE: For specific course offerings, check the *Schedule of Classes* issued fall 1990, winter 1991, and spring 1991.

LOWER DIVISION

10. Human Origins: Human Evolution (4)
(Formerly AN 25) 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.

11. Human Origins: Archaeological Anthropology (4)
(Formerly AN 26) An introduction to the history of human culture from the Neandertals through the growth of Bronze Age empires, focusing on major cultural inventions such as agriculture, medicine, metallurgy, and writing and on responses to environment and population growth.

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.

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.

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.

24. Cultural Anthropology: Symbols (4)

The study of how individuals use symbolic representations to understand their world, with emphasis on the ways in which symbols are constructed and on their social and psychological functions.

42. The Study of Primates in Nature (4)

Some of the major primate field studies will be selected for study to illustrate common features of primate behavior and behavioral diversity within the order. Topics will include mother-infant relations, communication, female hierarchies, proto-cultural behavior, social learning and tool use, play, cognition and self-awareness. Field study materials will be presented in lecture, slides, and films.

49. Japanese Culture and Society (4)

This course, open to all interested students, provides a multi-perspective view of postwar Japanese cultural productions and social institutions that challenges facile stereotypes of both U.S. and Japanese origin. Among the subjects and issues explored include urban vs. rural life, ethnic diversity, kinship, marriage, gender and sexuality, ancestor worship, work and leisure, education, laws, and internationalization vs. nationalism.

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 four times for two hours during the quarter.

UPPER DIVISION

***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. *Prerequisite: AN 10 or 25.* Taught in alternate years.

***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. *Prerequisite: AN 10 or 25.* Taught in alternate years.

102. Latin American Societies and Culture (4)

This course is an 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: AN 22 or introductory anthropology elsewhere or consent of instructor.*

103. 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. Background in anthropology or Chinese studies is desirable. *Prerequisite: AN 32 or AN 144.*

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 of all three types considered and societies from all parts of sub-Saharan Africa studied intensively.

*These courses can be counted for the biological anthropology concentration.

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: AN 22 or introductory anthropology at another university.* (Required for major in anthropology.)

106. Cultural Anthropology (4)

A web of problematic meanings lies behind social relationships and institutional frameworks. This perspective has come to play an important role in the discussion of human affairs since the last century. The course considers the concept of culture in anthropology as a particularly forceful statement of such a perspective. *Prerequisite: AN 22 or 105, or introductory anthropology at another university.* (Required for major in anthropology.)

107. Psychological Anthropology (4)

This course considers the interrelationships of aspects of both individual personality and sociocultural systems. Emphasis will be placed on the relation of sociocultural contexts to motives, values, cognition, personal adjustment, stress and pathology, and to qualities of personal experience. *Prerequisites: AN 22 or 105, and 106.* (Required for major in anthropology.)

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.

109. Chinese Familism (4)

This course explores the ethnography of family life in pre-communist and noncommunist 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: AN 32 or AN 144.*

***110. Perspectives on Human Evolution (4)**

This is a special seminar for students who wish to explore advanced topics in physical anthropology. The course focus will change year to year. May be repeated one time for credit. *Prerequisite: AN 10 or 25, or 100 and one other course in physical anthropology, and consent of instructor and department stamp.* Taught in alternate years.

111. Anthropology of Folklore (4)

This course reviews the major anthropological approaches to folklore: Finnish-historical-geographical, classical functionalist, structuralist and psychological. These approaches will be examined in the context of analyzing specific folk narratives (myth, legend, and folktale), beliefs, proverbs, riddles, humor, and verbal duelling. Also presented are the folkloric issues surrounding ethnicity, power, gender, and world view. *Prerequisite: AN 22 or introductory anthropology elsewhere or consent of instructor.*

112. Femininity and Masculinity in Japan (4)

This course explores the sex/gender system as it is manifested in Japanese culture and society, both historically and in the present, and in the context of more general anthropological theory. The sociocultural domains to be examined include creation myths, verbal and non-verbal communication, militarization, comic books, advertising, literature, and theatre. *Prerequisite: any one of the following: AN 22, a Japanese studies course, a women's studies course, or consent of instructor.*

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.

115. Marriage and Family Life in Cultural Perspective (4)

Sources of power, types of relationships, and means for spouses and other family members to strive for their goals will be examined with emphasis on the part played by shared beliefs and values. Variety of relations between spouses, parents and children, and siblings in different societies will be consid-

ered and the consequences for the individual, the family, and the society examined. *Prerequisite: upper-division standing or consent of instructor.*

117. Cultural Belief Systems: Interpretation and Explanation (4)

There is a significant debate in contemporary anthropology about the possibilities and limitations in understanding "other cultures"—a debate that will shape the very nature of anthropological claims in making sense of cultural belief systems. Drawing on materials in anthropology, literature, and philosophy and on selected ethnographic studies, this seminar will explore matters of interpretation, explanation, rationality, and relativism that are the central foci of this lively debate. *Prerequisites: AN 106 or consent of instructor and department stamp.*

118. Cognitive Anthropology (4)

This course will explore the relation between culture and cognition. Topics to be covered 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.*

121. Women in Cross-Cultural Perspective (4)

A comparative and analytic study of the ways women function in a variety of settings. Particular attention will be given to the cultural aspects of women's roles. *Prerequisite: AN 22 or introductory anthropology at another university.*

122. Japanese Psychology and Psychotherapies (4)

This course explores Japanese psychology in the context of myth, self- and gender-identity, interpersonal relations, class, ethnicity, family, friendship, urbanization, and conflict. In addition, varieties of psychotherapies, from Morita Therapy to those crafted by the "new" religions, are examined. *Prerequisite: any one of the following: AN 49, 107, 112, 146, or consent of instructor.*

123. National Character (4)

The course will survey work done on the national character of a selection of modern nations, including the United States. A variety of types of data will be examined, including movies and novels. Theoretical and methodological issues will be discussed. (Students with previous credit for AN 27 will not receive credit for AN 123.) *Prerequisite: AN 22 or introductory anthropology at another university, or consent of instructor.*

124. Sex, Love, and Culture (4)

This course will deal with cultural and psychological factors in sexual behavior and sex-related roles both within and beyond the social context of the family. The course will have an evolutionary and cross-cultural perspective. The symbolic elaboration of sex and the replacement of "arranged" with "love" relationships will also be explored. *Prerequisite: AN 22 or introductory anthropology at another university.*

125. Contemporary Central America (4)

This course focuses on anthropological contributions to the understanding of contemporary Central America. We shall consider ecological influences in the region, historical continuities and change, economic systems, personality, ethos, ethnicity, migration, the three R's in contemporary Central America (religion, reform and revolution), the culture of terror, and current developments in Central American anthropology. *Prerequisite: AN 22 or consent of instructor.*

**128. The Anthropology of Medicine (4)
(Same as Cont. Issues 136)**

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 Tradition" 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.*

129. Female, Male, and Gender: The Cultural Shape and Social Force of Sexual Difference (4)

This 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: AN 22 or equivalent introductory course at another university.*

131. Culture Change and Applied Anthropology (4)

No cultures today are isolated and unchanging. This course offers theory and case studies in cultural evolution, continuity, and change. On this base several applied fields of anthropology will be examined both as to method and the ethics of cultural intervention. *Prerequisite: AN 22 or consent of instructor.*

***132. Conservation and the Human Predicament (4) (Same as Biology 176)**

This course is an interdisciplinary discussion of the human predicament, the bio-diversity crisis, and the importance of biological and environmental conservation in sustaining future societies. Using lectures and case studies we will explore the consequences of habitat destruction and species extinctions on the biosphere and the welfare of humans. Although the course has strong biological underpinnings, the intent is to explore the cultural, social, economic, and political implications of international wildlife and habitat conservation. *Prerequisites: AN 10 and upper-division standing or consent of instructor.* Taught in alternate years.

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.

135. Indian Society (4)

A study of the social structure of India, with particular reference to caste and political organization. *Prerequisite: upper-division standing.*

136. Culture and Personality in China (4)

General introduction to traditional (pre-Communist) China, with special attention to popular culture and local-level social structure seen in relation to personality formation and value orientations. Background in anthropology or Chinese studies is desirable. *Prerequisite: AN 32 or AN 144.*

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 in that area. *Prerequisite: AN 22 or introductory anthropology at another university.*

139. Religious Cults and Social Movements (4)

Religious cults and social movements will be studied, particularly as they enter into rapid cultural and social change. Relations between cults and movements in form and process will be examined in a variety of specific cases. *Prerequisite: AN 22 or introductory anthropology elsewhere.*

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, and its social and psychological functions. Materials are drawn from Western and non-Western, primitive and high religions alike. *Prerequisite: AN 22 or introductory anthropology at another university.*

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 non-learning, culture and achievement, culture and cognition, and cross-cultural research in education. *Prerequisite: AN 22 or equivalent, or consent of instructor.*

144. Traditional Chinese Society (4)

This 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 PRE-REQUISITE TO OTHER UPPER-DIVISION ANTHROPOLOGY COURSES ON CHINA. *Prerequisite: upper-division standing or consent of instructor.*

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.*

146. Everyday Religiosity in Japan (4)

This course explores the different forms of religiosity that inform and are informed by popular culture and everyday life in Japan past and present. Rather than dwell exclusively on such "great traditions" as Buddhism and Confucianism, or on formal analyses of Shinto, we will focus on the popular, "common sense" dimensions and expressions of Japanese religiosity, which include shamanism, ancestor worship, votive tablets, and fortune-telling, among others. Much emphasis is placed on sex/gender differences regarding religious work, experience, and symbolism and the historical and contemporary roles of girls and women as religious specialists are examined in great detail. *Prerequisite: upper-division standing and consent of instructor if no previous Japan course.*

147. Ritual and Symbolism (4)

An examination of the place of symbols in the ritual systems of large- and small-scale societies, and a critical evaluation of theoretical models commonly applied to their analysis and interpretation. *Prerequisite: AN 22 or introductory anthropology at another university.*

***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. *Prerequisite: AN 42, Biology 164 recommended.* Taught in alternate years.

149. Hinduism (4)

This course studies Hinduism as a living religion in historical, anthropological, and psychological perspective. It uses readings in Indian history, Hindu theology, and presentations of the religious life of a contemporary Nepalese Hindu community. *Prerequisites: upper-division standing, AN 22 or equivalent.*

150. Culture, Communication, and Meaning (4)

An examination of elements of systems of meaning—their acquisition, communication, and pathology in anthropological perspective. *Prerequisite: AN 22 or equivalent.*

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: AN 22 or introductory anthropology at another university.*

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 works 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.*

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: previous upper-division work in anthropology.*

155. Models of Madness: Problems in Ethnopsychiatry (4)

This course explores selected problems of psychiatric etiology, symptomatology, and classification; diagnosis and labeling; prognosis; and therapy—with special attention to the interrelationships of cultural, psychological, and social factors. Emphasis is given to the psychocultural features of illness phenomena. *Prerequisite: AN 22 or introductory course in anthropology at another university.*

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 developmental psychology. *Prerequisite: AN 22 or equivalent.*

158. Psychoanalytic Anthropology (4)

A critical examination of the anthropological works of Freud and of selected Freudian anthropologists and an assessment of their influence on anthropological theory. *Prerequisite: upper-division standing; AN 22 or consent of instructor.*

***159. Biological and Cultural Perspectives on Intelligence (4)**

Our attitudes toward other individuals (and species) are often shaped by their apparent "intelligence." This course will discuss the significance of brain size/complexity, I.Q.'s and I.Q. tests, communication in marine mammals and apes, complex behavioral tactics; and the evolution of intelligence. *Prerequisite: any one of the following: AN 10, AN 25, AN 42, Biology 3, Biology 13 or consent of instructor.* Taught in alternate years.

***161. Human Evolution (4)**

The study of human evolution is complex; the interpretation of fossil material, its morphology, variation, phylogenetic relationships, the 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, distinctive morphology and major problems in their study today. *Prerequisite: Any one of the following: AN 10, AN 25, AN 42, or consent of instructor.* Taught in alternate years.

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: one course in anthropology here or elsewhere.*

164. The Psychoanalytic Study of Folklore (4)

This course will introduce students to the psychoanalytic study of folklore. It will be expected that students have some knowledge of folklore scholarship. Hence AN 111 (Anthropology of Folklore) is a prerequisite for this course. The course will examine folklore materials, including myths, folktales, legends, games, humor, etc., in light of the Freudian contribution to the study of culture. *Prerequisite: AN 111.*

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: AN 22 or introductory anthropology at another university.*

167. Japanese Popular and Mass Culture (4)

This course is a critical exploration of popular and mass cultural production in the twentieth century. After addressing theoretical issues, including "class," state formation, and attempts to define popular and mass culture—modern and post-modern—not to mention "the people," the subjects examined include styles of protests, militarization, "Westernization," urbanization; festivals, theater, cinema, mass media, comic books, international expositions such as Tokyo Disneyland, and advertising. *Prerequisite: upper-division standing or consent of instructor.*

168. Nature and Nurture: Race, Gender, and Culture (4)

The course will examine 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.*

170. Language and Culture in Asia (4)

Introduction to anthropological thinking about the relationships between language, culture and society, including the use of "language models" in other areas of anthropology. Examples will be taken largely from Asia and the Pacific Basin. *Prerequisite: AN 22 or equivalent at another university or consent of instructor.*

172. Cultural Study of Interpersonal Behavior (4)

A variety of approaches to the study of interpersonal behavior will be examined, with an emphasis on the way in which interpersonal behavior is perceived and understood. Videotape and other recording techniques will be employed. *Prerequisite: upper-division standing.*

***173. The Issues of Consciousness in Animals and Humans (4)**

(Same as Frontiers of Science 140)

This course strives to look at the issue of consciousness as it has been modified by recent advances in several disciplines. 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. The course would draw from faculty expertise in several departments. *Prerequisite: AN 10 or 25 or any introductory course in evolution/animal behavior or consent of instructor.* Taught in alternate years.

174. Folk Culture and Popular Culture (4)

Cultural performances, such as stories, songs, spectacles, and carnivals, sometimes reveal broad patterns of personal and social experience. In this course, the similarities and differences of cultural performances in face-to-face societies and modern industrial societies will be considered. *Prerequisite: one lower-division or upper-division course in anthropology.*

***175. Modeling the Behavior of our Early Ancestors (4)**

Models of human evolution combine elements of science and myth, often embodying cultural ideals and reflecting current world views. This course looks closely at the assumptions and principles, such as those concerning ecology, biomechanics, and behavior, which are used in reconstructions of the course of human evolution. Major models of human evolution such as "man the hunter" and "woman the gatherer" are examined in light of underlying assumptions, principles, and cultural ideals. *Prerequisite: AN 10 or equivalent introductory physical anthropology course or consent of instructor.* Taught in alternate years.

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 or consent of instructor.*

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: AN 22 or introductory course at another university.*

***187A. Intern Seminar in Physical Anthropology (2)**

This intern seminar is designed to complement students' research experiences in the Academic Internship Program in physical anthropology at the San Diego Museum of Man. Structured readings and discussions will focus on the anatomy, pathology, and classification of skeletal remains and x-ray analyses of skeletal materials. Research paper is required. *Prerequisites: AN 10 or 25 and simultaneous enrollment in Warren 197, Physical Anthropology-Museum of Man.* (P/NP grades only.) *Department stamp required.*

187B. Intern Seminar in Ethnography and Archaeology (2)

This intern seminar is designed to complement students' research experience in the Academic Internship Program in ethnography and archaeology at the San Diego Museum of Man. Structured readings and discussions will focus on problems in the analysis of material culture and analysis of classifications of artifacts and site excavations. Research paper is required. *Prerequisites: AN 106 and simultaneous enrollment in Warren 197, Ethnography Archaeology-Museum of Man.* (P/NP grades only.) *Department stamp required.*

***187C. Intern Seminar in Ethology (2)**

This intern seminar is designed to complement students' research experience in the Academic Internship Program in ethology at the San Diego Wild Animal Park and/or the San Diego Zoo. Structured readings and discussions will focus on problems of analysis in the observational study of animal behavior and human behavior (in relation to animals) and problems of wildlife management and conservation in relation to ethological studies. Research paper is required. *Prerequisite: AN 10 or 25 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 G.P.A. Simultaneous enrollment in Warren 197; Ethology Zoo.* (P/NP grades only.) *Department stamp required.*

191. Seminar in Medical Anthropology (4)

Seminar in medical anthropology to go beyond principles learned in introductory course: to examine theory and method in the analysis of studies and research projects through surveying the literature and clinical situations (medical anthropological writings, medical grand rounds, epidemiology). *Prerequisite: AN 128/C.I. 136 or AN 178/C.I. 140 or consent of the instructor.* *Department stamp required.*

196. Thesis Research (4)

Independent preparation of a senior thesis under the supervision of a faculty member or committee. Temporary fall and winter quarter grades of I/P will be assigned. Final letter grade for all three quarters will be given in spring quarter based on thesis. May be repeated for credit two times. *Prerequisite: students will be admitted by invitation of the department.* *Department stamp required.*

197. Field Studies (4)

Individually arranged field studies giving practical experience outside the university. *Prerequisites: consent of instructor and department approval.* (P/NP grades only.) *Department stamp required.*

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 stamp required.*

199. Independent Study (2-4)

Independent study and research under the direction of a member of the staff. *Prerequisite: special permission of instructor.* (P/NP grades only.) *Department stamp required.*

GRADUATE

201. Techniques and Methods in Psychological Interviewing (4)

An introduction to a wide range of techniques leading to psychological inferences about groups and individuals in cross-cultural research. Includes depth interviewing and observation. *Prerequisite: graduate standing in anthropology.*

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.*

204. Applied Anthropology (4)

This seminar will deal concretely with the application of anthropological theory and method to issues of public policy and public concern. It will particularly deal with the role of the anthropologist in such settings and the ethical concerns of applied social science. *Prerequisite: graduate standing.*

209. The Study of Culture in Complex Societies (4)

This seminar will examine a sample of ethnographies describing life in complex modern societies. Drawing on these materials, an attempt will be made to develop a theoretical model of the major forces acting on the individual in the modern world. *Prerequisite: graduate standing.*

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.*

218. Cognitive Anthropology (4)

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethnoscience, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

219. Computer Applications in Anthropology (4)

This course will provide an introduction to presently available microcomputer hardware and software, with emphasis on applications of interest to anthropologists. Students will have an opportunity to use several different microcomputer systems. *Prerequisite: graduate standing or consent of instructor.* (S/U grades permitted.)

222A. Anthropology in Melanesia (4)

Explores selected aspects of anthropological "theory" in relation to a corpus of Melanesian ethnography and with special attention to "controlled comparison" and to interrelationships of "theory," "ethnographic region," and "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor.* (S/U grades only.)

*These courses can be counted for the biological anthropological concentration.

222B. Anthropology in Melanesia (4)

Explores selected aspects of anthropological "theory" in relation to a corpus of Melanesian ethnography and with special attention to "controlled comparison" and to interrelationships of "theory," "ethnographic region," and "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor.* (S/U grades only.)

222C. Anthropology in Melanesia (4)

Explores selected aspects of anthropological "theory" in relation to a corpus of Melanesian ethnography and with special attention to "controlled comparison" and to interrelationships of "theory," "ethnographic region," and "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor.* (S/U grades only.)

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.*

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.*

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.)

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.)

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.)

234. Dynamics of Culture (4)

The central issue in this seminar is how culture operates as the basis for social life, and a closely related additional issue is what perspectives of theories allow us to understand both cultural continuity and culture change. Ethnographies will be read to serve as the basis for inferring the views of "culture" taken by the authors as well as reading theoretical statements from cognitive, symbolic, social structural, structural theorists, and personality and culture viewpoints. *Prerequisite: graduate standing.*

236. Computer Uses in Anthropology (4)

The techniques of computer programming and the use of operating systems will be covered in course and laboratory work. Problems will be oriented toward anthropological methods of quantitative and linguistic analyses.

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 difference. *Prerequisite: graduate standing in anthropology or consent of instructor.*

245. Anthropological Perspectives on Symbolism and Ritual (4)

Through a critical review of prevailing anthropological perspectives, this seminar explores the nature of symbols—their social, cultural and psychological dimensions, and their incorporation into ritual performances. *Prerequisite: graduate standing in anthropology or consent of instructor.*

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.*

248. Cults and Movements: A Psychocultural Perspective (4)

This course will approach the study of cults and movements on two levels: 1. the role of cults and movements (religious, ethnic, nationalistic, and ideological) in sociocultural change and genesis; 2. the role and psychological status of individuals mediating between society and culture. *Prerequisite: graduate standing or consent of instructor.* (S/U grades permitted.)

249. Hinduism (4)

This seminar will consider Hinduism from an anthropological and psychological perspective, with an emphasis on Hinduism of Nepal. The emphasis is on the symbolic and communicative dimensions of Hinduism and their meanings for community and individual life in Nepal. *Prerequisite: graduate standing in social science or humanities.*

252. Psychocultural Aspects of the Self (4)

The seminar explores the nexus of notions of self, person, and individual. Special attention is focused on recent developments in anthropology, philosophy, psychoanalysis, and social psychology which articulate aspects of the concept of the self. *Prerequisite: graduate standing.*

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.*

254. Postmodern Anthropology: A Critical Appraisal (4)

This seminar addresses the philosophical issues roused by recent trends in anthropological writing. The main foci will be to identify the elements of "postmodern" anthropology and to examine critically their implications for empirical methodology, ethnographic objectivity, and cross-cultural analysis. This will involve a study of the philosophic positions taken by notable figures in the "postmodern" movement, both in anthropology and in adjacent fields. *Prerequisite: graduate standing in anthropology.*

255. The Moral and the Rational (4)

The course will examine anthropological, psychological, and philosophical discussions of rational belief and moral commitment. Readings will include both classic and more recent authors: Frazer, Levy-Bruhl, Tambiah, Evans-Pritchard, Levi-Strauss, Popper, Kuhn, Putnam, MacIntyre, Lifton, etc. *Prerequisite: graduate standing in anthropology or consent of instructor.*

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 or might be implemented, anticipating needs and means of data analysis. *Prerequisite: second-year anthropology students.*

257. Ethnographies of Japan (4)

We will examine ethnographies of Japan both to learn about Japan and the writing and reading of ethnographic texts, and the politics of anthropological interpretations. Since textual

strategies are affected by culture, sex and gender, ethnicity, and sociohistorical exigencies, we will read ethnographies by female and male Japanese and Euro-American anthropologists published in English over the past century. *Prerequisites: graduate-standing and consent of instructor, anthropology course or a course on Japan.*

258. Selected Topics in Psychoanalytic Theory (4)

A critical analysis of the psychoanalytic approach to selected topics in anthropology, such as religion, totemism, gender, social character, and symbolism. The topic for each seminar will be posted in advance. *Prerequisite: graduate standing.*

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.* (P/NP and S/U grades only.)

270. 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. Course will be offered quarterly but can be taken for credit only twice. Students must begin the program in the fall quarter. (S/U grades only.) *Prerequisites: graduate standing in anthropology and consent of instructor.* (S/U grades only.)

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.*

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.

280A. Core Seminar in Anthropology (4)

This seminar represents one of three interconnected core courses that constitute the foundation of the first year of graduate study. This basic sequence of courses emphasizes both the historical and the contemporary shapes of certain central problems in cultural, psychological, and social anthropology. Each seminar will focus on significant anthropological debates concerning these problems that are phrased in terms of the complex interrelationships of theory and ethnographic data and that attend to fundamental issues of comparative analysis. *Prerequisite: graduate standing in anthropology.*

280B. Core Seminar in Anthropology (4)

This seminar represents one of three interconnected core courses that constitute the foundation of the first year of graduate study. This basic sequence of courses emphasizes both the historical and the contemporary shapes of certain central problems in cultural, psychological, and social anthropology. Each seminar will focus on significant anthropological debates concerning these problems that are phrased in terms of the complex interrelationships of theory and ethnographic data and that attend to fundamental issues of comparative analysis. *Prerequisite: graduate standing in anthropology.*

280C. Core Seminar in Anthropology (4)

This seminar represents one of three interconnected core courses that constitute the foundation of the first year of graduate study. This basic sequence of courses emphasizes both the historical and the contemporary shapes of certain central problems in cultural, psychological, and social anthropology. Each seminar will focus on significant anthropological debates concerning these problems that are phrased in terms of the complex interrelationships of theory and ethnographic data and that attend to fundamental issues of comparative analysis. *Prerequisite: graduate standing in anthropology.*

281. Introductory Seminar (4)

This required core seminar is held in the first quarter of the first year of graduate study. Faculty members will present an account of their own interests or of present research. Where appropriate a short preliminary reading list will be given, for the particular lecture. In addition there will be readings (mainly but not exclusively of books or essays produced by the speakers). Two weeks will be set aside for integrating discussion. *Prerequisite: first-year graduate standing in anthropology.*

282. Ethnological Issues (4)

An examination of special anthropological issues and problems which have arisen out of ethnographic work in particular regions of the world, e.g., the "potlatch" of the Pacific Northwest, the "cargo cults" of Melanesia, etc. Issues will vary from year to year. *Prerequisite: graduate standing in anthropology. Second-year core course.*

283. Ethnographic Field Methods (4)

An opportunity to use several main field methods of social and cultural anthropology and to discuss their strengths and problems. Includes the genealogical method, various types of interviewing and observation, oral history, and maintenance of field notes and indexes. *Prerequisite: graduate standing in anthropology. Third-year core course.*

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.)*

295. Master's Thesis Preparation (1-12)

The student will work on the master's thesis under the direction of the departmental committee chairperson. 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 chairperson. (S/U grades only.)*

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 chairperson. (S/U grades only.)*

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 chairperson. (S/U grades only.)*

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.)*

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.)*

299. Dissertation Research (1-12)

Prerequisite: Ph.D. candidacy in anthropology. (S/U grades only.)

500. Apprentice Teaching (1-4)

The course, designed to meet the needs of the graduate students who serve as TAs, includes analyses 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

Ph.D. degree. The amount of teaching required is equivalent to the duties expected of a 50 percent teaching assistant for one quarter in each of the student's first three years as a graduate student in the department. Enrollment for four units in this course documents the requirement. (S/U grades only.)

APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

See Engineering, Division of

APPLIED OCEAN SCIENCE

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

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- LeRoy M. Dorman, Ph.D., *SIO; GRD*
- Carl H. Gibson, Ph.D., *AMES; SIO*
- Robert T. Guza, Ph.D., *SIO; CCS*
- Douglas L. Inman, Ph.D., *SIO; CCS/MAP*
- Robert Pinkel, Ph.D., *SIO; MPL*
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Lecturers

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- Scott A. Jenkins, Ph.D., *SIO; CCS*
- Dick Seymour, Ph.D., *SIO; FOR*

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- Christian P. de Moustier, Ph.D., *SIO; MPL*
- Toyoaki Nogami, Ph.D., *SIO; MRD*
- Spahr C. Webb, Ph.D., *SIO; MPL*

Associated Research Groups

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- Institute of Geophysics and Planetary Physics, *IGPP*
- Center for Coastal Studies, *CCS*
- 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 interdepartmental Ph.D. program concerned with man's 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 of 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 210A (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 specialization. In consultation with an adviser, students will plan a curricular path of courses which will adequately prepare them in their field of specialization. The courses may be selected from the entire catalog of courses available on the UCSD campus or where appropriate from other UC campuses and other universities.



BIOLOGY

STUDENT AFFAIRS OFFICE
2322 Humanities and Social Sciences Building
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(619) 534-3835 (graduate)

FINANCIAL AND ADMINISTRATIVE OFFICES
2130 Bonner Hall, Revelle College

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- Michael E. Gilpin, Ph.D.
- Melvin H. Green, Ph.D.
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- Christopher J. Wills, Ph.D.
- David S. Woodruff, Ph.D.
- Juan Yguerabide, Ph.D.

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- P.A.G. Fortes, M.D., Ph.D.
- Stephen M. Hedrick, Ph.D.
- Muriel N. Nesbitt, Ph.D.

- John W. Newport, Ph.D.
- Ramon Piñon, Ph.D.
- Percy J. Russell, Ph.D.
- Suresh Subramani, Ph.D.
- Sandra L. Vehrencamp, Ph.D.
- Jean Y. J. Wang, Ph.D.
- Charles G. Zuker, Ph.D.

Assistant Professors

- Nigel M. Crawford, Ph.D.
- James T. Kadonaga, Ph.D.
- James W. Posakony, Ph.D.
- Trevor D. Price, Ph.D.
- Robert J. Schmidt, Ph.D.
- Julian I. Schroeder, Ph.D.
- Michael P. Yaffe, Ph.D.
- Martin F. Yanofsky, Ph.D.
- Michael J. Bevan, Ph.D., *Adjunct Professor*
- Suzanne Bourgeois, Ph.D., *Adjunct Professor*
- Peter F. Brussard, Ph.D., *Adjunct Professor*
- Jacques Chiller, Ph.D., *Adjunct Professor*
- Melvin Cohn, Ph.D., *Adjunct Professor*
- Walter Eckhart, Ph.D., *Adjunct Professor*
- Ronald M. Evans, Ph.D., *Adjunct Professor*
- Daniel Goodman, Ph.D., *Adjunct Professor*
- Meredith Gould, Ph.D., *Associate Adjunct Professor*
- Martin Haas, Ph.D., *Adjunct Professor*
- Yasuo Hotta, Ph.D., *Research Biologist—Emeritus*
- Frank M. Huennekens, Ph.D., *Adjunct Professor*
- Anthony R. Hunter, Ph.D., *Adjunct Professor*
- Norman R. Klinman, Ph.D., *Adjunct Professor*
- Simon LeVay, Ph.D., *Adjunct Associate Professor*
- Oliver A. Ryder, Ph.D., *Associate Adjunct Professor*
- Bartholomew M. Sefton, Ph.D., *Associate Adjunct Professor*
- Jonathan Sprent, Ph.D., *Adjunct Professor*
- Inder Verma, Ph.D., *Adjunct Professor*
- Geoffrey M. Wahl, Ph.D., *Adjunct Associate Professor*
- William O. Weigle, Ph.D., *Adjunct Professor*
- David J. Western, Ph.D., *Adjunct Professor*

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, (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 arts degrees granted in each of these majors will be so designated.

The Student Affairs Office, 2322, Humanities and Social Sciences Building, administers the undergraduate biology program for all five colleges and publishes the *Biology Undergraduate Handbook* each year. **For complete details regarding the policies and procedures pertaining to the biology programs, please refer to the *Biology Undergraduate Handbook* or 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, a copy of your latest UCSD transcript, and any transfer documentation pertaining to the specific major to the Department of Biology's Student Affairs Office (2322 H&SS). Refer to the *Biology Undergraduate Handbook* to determine the appropriate documentation required for transfer students.

DEPARTMENT OF BIOLOGY RESIDENCY REQUIREMENT

To receive a bachelor of arts 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 who participate in the Education Abroad Program may petition three departmentally approved upper-division EAP courses as substitutes toward this requirement.) 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, 198, 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. Refer to the *Biology Undergraduate Handbook* or contact the Student Affairs Office (H&SS 2322) 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 chairman, 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 refer to the *Biology Undergraduate Handbook* or contact the Student Affairs Office (H&SS 2322).

EAP COURSES (EDUCATION ABROAD PROGRAM)

It is very important that students who plan to participate in the Education Abroad Program 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.

SPECIAL STUDIES COURSES

Only one quarter of Biology 195 and one quarter of Biology 198 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, H&SS 2322.

Biology 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 in which they want to teach, have an overall GPA of 3.0, and at least ninety total units. Students should apply very early in the quarter prior to the quarter they wish to teach.

Biology 199

Independent Study Biology 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 Biology 199 students must have accrued at least ninety quarter-units with an overall UC GPA of at least 3.0. Students may select for their instructor any professor at UCSD, but the Biology 199 application must be submitted for department approval to the Department of Biology. The deadline to apply for Biology 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 (Biology 198 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.

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.

Biology 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. Biology 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 course requirements for the general biology major. Spe-

cific 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 I (Biology 101), its organic chemistry prerequisites (Chemistry 140A and B), and Genetics (Biology 131) are prescribed requirements for general biology majors.

1. Organic Chemistry (Chemistry 140A and 140B)
2. Biochemistry (Biology 101)
3. Genetics (Biology 131)
4. One four-unit upper-division biology lab to be chosen from the following: Biology 103, 112, 123, 132, 138, 142, 152, 154, 157, 170, 171, 172, or 173. (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
5. Nine additional four-unit upper-division courses taken through the UCSD Department of Biology are required. Only one quarter of Biology 195 and one quarter of either Biology 198 or 199 may be applied toward this requirement. (Subsequent quarters of 195, 198, 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 (Biology 106) and Cell Biology (Biology 111) are strongly recommended for those contemplating applying to graduate or professional schools.

ANIMAL PHYSIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

The animal physiology major provides a program for studying the bodily 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 majors are also well prepared to enter other professions such as physiological research, physical education, agriculture, and wildlife management.

LOWER-DIVISION REQUIREMENTS

Biology 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. Biology 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 major. The first four requirements provide exposure to the current understanding of subcellular function that should be at the command of all modern biologists. Requirements 5 through 8 constitute the core of the animal physiology major. By choosing four other four-unit upper-division biology courses (requirement 9), a program geared to the needs of the individual student can be formulated.

1. Organic Chemistry (Chemistry 140A, 140B, and 143A)
2. Biochemistry (Biology 101)
3. Molecular Biology (Biology 106)
4. Genetics (Biology 131)
5. Mammalian Physiology (Biology 151 and 153)
6. Comparative Physiology (Biology 155)
7. Neurobiology (Biology 156)
8. One of three Physiology Laboratories (Biology 152, Biology 154, or Biology 157). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
9. Four additional four-unit upper-division courses taken through the UCSD Department of Biology are required. These may include no more than one quarter of Biology 195 and one quarter of either Biology 198 or Biology 199. (Subsequent quarters of 195, 198, or 199 may be applied toward college and university requirements.)

BIOCHEMISTRY AND CELL BIOLOGY MAJOR

Please refer to the "Admission to the Majors" notice detailed earlier in the Department of Biology section of this catalog.

This major is designed to provide students with the fundamental courses required for entry into a school of medicine or into postgraduate training in a wide variety of areas of biological and biomedical sciences: biochemistry, biophysics, genetics, molecular biology, cell biology, developmental biology, microbiology, virology, human biology (physiology, metabolism, genetic disorders), cancer biology, pharmacology, and others. The emphasis is on basic principles which help us understand those processes unique to living organisms at the molecular level.

The program includes two required upper-division biology laboratory courses to provide practical experience with modern techniques and useful technology for those seeking positions as lab technicians in clinical and basic research laboratories. The opportunity to select five elective courses allows students either to seek a still broader background in a variety of biology courses or to begin specialization in a chosen field of study.

LOWER-DIVISION REQUIREMENTS

Biology 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. Biology 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. Biochemistry I (Biology 101)
4. Biochemical Techniques (Biology 103). (A Biology 199 research project and/or employment in

a lab **may not be petitioned** to satisfy this lab requirement.)

5. Physical Biochemistry (Biology 104)
6. Molecular Biology (Biology 106)
7. Cell Biology (Biology 111)
8. Genetics (Biology 131)
9. One four-unit upper-division biology lab to be chosen from the following: Cell Biology (Biology 112), Embryology (Biology 123), Eucaryotic Genetics (Biology 132), Microbial Genetics (Biology 137), Recombinant DNA Techniques (138), Microbiology (142), Mammalian Physiology (Biology 152 or 154), Neurobiology (Biology 157), or Organic Chemistry (Chemistry 143C). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
10. Five additional four-unit upper-division courses taken through the UCSD Department of Biology are required. Only one quarter of Biology 195 and one of Biology 198 or 199 may be applied toward the fulfillment of this requirement. (Subsequent quarters of 195, 198, 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 majors in molecular biology is designed to provide an intensive exposure to the theoretical concepts and experimental techniques of molecular biology. As such, it is recommended for those students who have a particularly strong interest in this field of study. Considerable emphasis is placed on chemistry, biochemistry, and genetics for students enrolled in the program.

LOWER-DIVISION REQUIREMENTS

Biology 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. Biology 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 2A, B, C and lab

UPPER-DIVISION REQUIREMENTS

1. Organic Chemistry (Chemistry 140A and B)
2. Physical Chemistry (Chemistry 131) or Physical Biochemistry (Biology 104)
3. Organic Chemistry Laboratory (Chemistry 143A) or Physical Chemistry Laboratory (Chemistry 105A)
4. Genetics (Biology 131)
5. Biochemistry (Biology 101)
6. Molecular Biology (Biology 106)
7. Cell Biology (Biology 111)
8. Microbial Genetics (Biology 136)
9. Regulation of Gene Activity in Eukaryotic Cells (Biology 125)
10. Biochemistry Laboratory (Biology 103) or Microbial Genetics Laboratory (Biology 137). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
11. Laboratory in Recombinant DNA Techniques (Biology 138). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
12. Four additional four-unit upper-division courses taken through the UCSD Department of Biology are required. Attention is drawn to Biology 143, Biology 113, and Biology 116. Only one quarter of Biology 199 and one of Biology 195 may be used to fulfill this requirement. (Subsequent quarters of 195, 198, 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**

Biology 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. Biology 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. Biochemistry I (Biology 101)
4. Biochemical Techniques (Biology 103). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
5. Molecular Biology (Biology 106)
6. Immunology (Biology 113)
7. Genetics (Biology 131)
8. Bacteriology (Biology 141)
9. Laboratory in Microbiology (Biology 142). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy this upper-division lab requirement.)
10. Animal Virology (Biology 143)
11. Medical Microbiology (Biology 144)
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 Biology 195 and one quarter of Biology 198 or 199. (Subsequent quarters of 195, 198, or 199 may be applied toward college and university requirements.) Other courses of special interest to microbiology majors are listed below:

- Cell Biology (Biology 111)
- Regulation of Gene Activity in Eucaryotic Cells (Biology 125)
- Membrane Biology (Biology 114)
- Microbial Genetics (Biology 136)

**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, 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 REQUIREMENT

Biology 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. Biology 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: Biology 3 may be taken before Biology 1 if the student has an adequate advanced high school biology background. It is preferred that Biology 3 be completed during the first year at UCSD.)

Mathematics: Three quarters of calculus are required. Mathematics 2A, 2B, and 2C are 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 (Biology 131). This course should be taken at the end of the second year.
2. Biometry (Biology 160). 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. (The old Biology 168/168L will be considered the equivalent of Biology 160. Students may not receive credit for Biology 160 after having completed Biology 168/168L.)
3. Biochemistry (Biology 101). 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; however, students must make this request via petition.
4. Ecology, Behavior, and Evolution. Seven four-unit courses to be chosen from Biology 161-179 are required. At least two of these courses must be laboratory or field courses (Biology 170, 171, 172, and/or 173). (A Biology 199 research project and/or employment in a lab **may not be petitioned** to satisfy these upper-division lab requirements.) Courses in the 161-169 series have only Biology 3 as a prerequisite and are designed to be taken by third-year students; courses in the 170-179 series have additional prerequisites and are designed to be taken by more advanced students. Laboratory courses may be taken either concurrently with the prerequisite lecture course *if Biometry (Biology 160) 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. Approval must be by petition. Only

one quarter of Biology 198 or 199 and one quarter of Biology 195 may be used to fulfill this requirement. (Subsequent quarters of 195, 198, 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 quarter; students will receive credit for three four-unit biology courses (one of which is a special studies course. If a student petitions to have all three Costa Rica courses counted toward the major, then he or she may not have another special studies course—199 or 197—counted toward the major also. Only one special studies course may be applied toward any of the six biology majors.) Prerequisites for the Costa Rica program are: Biology 162 and familiarity with Spanish). Consult the Education Abroad Program Office at the UCSD International Center for details.

Some other courses may be allowed but must be approved by petition prior to taking the courses.

No more than four of the upper-division courses required for this major may be taken outside of the UCSD department of biology. Transfer courses are considered to be outside of the department. The only exception to this policy would be Education Abroad Program courses. EAP students may petition to have more than four EAP courses counted toward the ecology, behavior, and evolution major, but those students must complete at least six upper-division courses (four-units each) taken through the UCSD Department of Biology to satisfy the residency requirement. This exception would not be in addition to other courses taken outside of the department.

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 (Biology 196) taken in addition to the major requirements for graduation. (Four units of senior thesis research—Biology 196—are to be completed during each of the final three academic quarters of the student's 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 Biology 199. Students may also withdraw voluntarily from the program and, if eligible, receive appropriate credit for Biology 199. Grades for Biology 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.
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, room 2322, Humanities and Social 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 Biology 196.

Entry into the second quarter of the program will require submission to the honors thesis adviser of a written report by the student, summarizing 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 Biology 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). Students may apply transferable biology courses, from another institution, toward the lower-division requirement, after obtaining approval from both the UCSD Biology Department 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.

INTEGRATED BACHELOR'S/ MASTER'S DEGREE PROGRAM

An integrated program leading to a bachelor of arts 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.A. degree)*, students interested in obtaining the M.S. degree within one year following receipt of the B.A. degree may apply to the department for admission to the program. (Contact the Department of Biology's Student Affairs Office.) The faculty director for the program (1990-91) is Professor William Harris.

The program is open only to UCSD undergraduates. The Department of Biology does not have financial aid available for students enrolled in this program.

* (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.A. degree.)

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.A./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 (Biology 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 (as far as the Department of Biology is concerned, these units **will** count toward the college graduation requirements). The student must confirm that the selected faculty adviser will not be on sabbatical leave during any quarter of the scheduled B.A./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.A. 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.A. 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.A.:	Application Due Date:
Fall 1991	November 1, 1990
Winter 1992	January 5, 1991
Spring 1992	April 5, 1991

Students who have been approved (by both the Department of Biology **and** the UCSD Office of Graduate Admissions) for the program must submit an application for enrollment in a Special Studies Course, Biology 271, for each, and every, quarter of participation in the B.A./M.S. program. This procedure is necessary to monitor the GPA requirement as described in this section. THE DEADLINE TO SUBMIT THE SPECIAL STUDIES APPLICATION FORM IS THE END OF THE EIGHTH WEEK OF THE QUARTER PRECEDING THE QUARTER IN WHICH THE BIOLOGY 271 IS TO BE COMPLETED. NO APPLICATIONS WILL BE ACCEPTED BY THE DEPARTMENT OF BIOLOGY AFTER THE DEADLINE DATE.

Research work (Biology 271) will only be credited toward the B.A./M.S. program require-

ments 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 (Biology 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 (Biology 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 [Biol. 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.A. degree.

b. Completion of at least four units of research (Biology 271) during each of the three quarters of the subsequent graduate year.

c. Completion of four units of teaching (Biology 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. (Biology 271 or 297 MAY NOT be used to satisfy this requirement. Biology 297 is intended for doctoral students **only** and B.A./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.A./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 Pattie Macpherson, the 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.A. 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.A./M.S. program must provide the Office of Graduate Admissions with a copy of their official UCSD transcripts with the B.A. degree posted, PRIOR TO THE COMMENCEMENT OF THE GRADUATE YEAR IN THE PROGRAM. Also, students are expected to contact the graduate coordinator (Pattie Macpherson) 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 Ms. Macpherson 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 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 Biology 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 Bi-

ology 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 eight years. Total registered time at UCSD cannot exceed eight 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 (rm. 2322, Humanities and Social 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 1990-91 only. It should not be assumed that the same schedule will continue after this academic year.

Attendance at the first lecture/lab is required. Non-attendance will result in the

student's name being dropped from the course roster. It would be the student's responsibility to officially drop the course at the registrar's office.

LOWER DIVISION

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)

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: Biol. 1.* (W,S)

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 demonstration. *Prerequisite: A full year of high school biology or Biol. 1.* **NOTE: Biology majors should complete this course during their first year at UCSD.** (W,S)

6. 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: Biol. 1.* (W)

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 Biol. 10 after receiving credit for Biol. 1.) (F,S)

11. Introduction to Molecular and Cell Biology (4)

An introduction to the chemical basis of living systems, the chemistry and biology of macromolecules, their organization and function in cells, and the molecular basis of evolution, differentiation, and reproduction. *Prerequisites: Chem. 5A and 5B, or the equivalent.* (S)

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: Biology 10 or equivalent.* (W)

13. 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

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major. **NOTE: Students may not receive credit for Biol. 13 after having completed Biol. 107.** (S)

14. 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: Biology 10 or equivalent.* (S)

15. 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)

16. 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: Biol. 10.* (W)

18. 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)

23. 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.

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 between 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)

UPPER DIVISION

■ BIOCHEMISTRY

101. Biochemistry 1 (4)

An introduction to biochemistry covering: protein structure, enzyme catalysis, and allosteric regulation; energy-producing pathways—glycolysis, the TCA cycle, oxidative phosphorylation, and fatty acid oxidation; and biosynthetic pathways—gluconeogenesis, glycogen synthesis and fatty acid biosynthesis. 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 Biol. 101 and Chem. 114B.) (F,W,S)

102. Biochemistry 2 (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: Biol. 101.* (W)

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: Biol. 101 (may be taken concurrently).* (NOTE: Students may not receive credit for both Biol. 103 and Chem. 112A.) (F,W,S) **Note: Students will be admitted to Biology 103 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

104. 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.* (S)

106. 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 eucaryotes. Three hours of lecture and one hour of recitation. *Prerequisites: Biology 101 and 131.* (NOTE: Students may not receive credit for both Biol. 106 and Chem. 114C.) (F,W)

107. 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: Biol. 101.* (F)

108. Immunochemistry (4)

Discussion of antibodies, antigens, complement, and their interactions. Three hours of lecture. *Prerequisites: Biol. 101, 131, and senior status.* (S)

109. Topics in Biophysics/Photobiology (4) (Same as 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)

110. Topics in Biochemistry (4)

An advanced course which covers in depth a specialized topic in biochemistry. Three hours of lecture. *Prerequisite: Biol. 101.* (F)

■ CELL BIOLOGY

111. 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: Biol. 1, 101, and 131.* (W,S)

112. Cell Biology Laboratory (4)

A laboratory course in the application of cellular techniques to biological problems. Ten hours of laboratory. *Prerequisite: consent of instructor and Biol. 111 (may be taken concurrently); Biol. 103 is strongly recommended.* (F) **Note: Students will be admitted to Biology 112 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

113. 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: Biol. 101, Biol. 106, upper-division standing.* (W)

115. 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: Biol. 101 (may be taken concurrently).* (F)

116. Molecular Basis of Disease (4)

An examination of the molecular bases for specific diseases including genetic and physiological disorders as well as bacterial and viral infections. The emphasis will be upon applying the principles of biochemistry and molecular biology to an understanding of disease. Medical considerations will be covered by substantial participation in the lecture schedule by faculty from the School of Medicine. Three hours of lecture. *Prerequisite: Biol. 111 (may be taken concurrently).* This course will be restricted to upper-division biology majors. (W)

■ DEVELOPMENTAL BIOLOGY

121. Developmental Biology (4)

The basic processes in embryogenesis will be considered in a variety of organisms at the levels of tissue, cellular, and molecular differentiation. The mechanisms of development will be explored. More detailed analyses of a few processes such as fertilization, sex determination, and pattern formation in *Drosophila* will be discussed. This course is open to upper-division students only. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 101, Biol. 106, Biol. 131.* (F)

122. 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: Biol. 101 and Biol. 131.* (W)

123. 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, Biol. 1 and Biol. 2 or the equivalent, and consent of the instructor.* (F) **Note: Students will be admitted to Biology 123 on a priority basis only. Go to room 2322, Human-**

ities and Social Sciences Building, *prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.* 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.

124. Developmental Physiology of Plants (4)

Cellular, physiological, and biochemical basis of plant growth and development. Three hours of lecture. *Prerequisite: Biol. 101; Biol. 106 and 111 are helpful.* (F)

125. 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: Biol. 106.* (S)

126. Plant Molecular Biology (4)

The molecular basis of plant growth and development including plant microorganism interactions. Three hours of lecture. *Prerequisite: Biol. 124.* (S) (Not offered in 1990-91.)

■ GENETICS

131. 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: Biol. 1 or the equivalent.* (F,W,S)

132. 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: Biol. 131 (may not be taken concurrently).* (S) **Note: Students will be admitted to Biology 132 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

134. 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: Biol. 131 (may not be taken concurrently); Biol. 106 is strongly recommended.* (W)

136. Microbial Genetics (4)

Organization and function of procaryotic genetic systems including sex factors, transduction, transformation, phage genetics, transposons, genetic engineering. Three hours of lecture. *Prerequisites: Biol. 106, Biol. 131, and consent of instructors.* (W)

137. Microbial Genetics Laboratory (4)

A laboratory lecture course emphasizing the genetics of bacteria, bacterial viruses, and principles of genetic engineering. One hour of lecture, one hour of discussion, and eight hours of laboratory. *Prerequisites: Biol. 131 and 136, and consent of instructor.* (S) (Not offered in 1990-91.)

138. 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: Biol. 136 and consent of instructor.* (S) **Note: Students will be admitted to Biology 138 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

■ MICROBIOLOGY

141. Bacteriology (4)

A discussion of the structure, growth, molecular genetics, and physiology of procaryotic microorganisms with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. Three hours of lecture and one hour recitation. *Prerequisites: organic chemistry; Biol. 101 (may be taken concurrently).* (F)

142. 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: Biol. 141 and consent of instructors.* (W) **Note: Students will be admitted to Biology 142 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

143. 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: Biol. 106.* (W)

144. 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: Biol. 106 and Biol. 141; recommended: Biol. 113.* (S)

■ PHYSIOLOGY

151. 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: Biol. 1, Biol. 2, and Biol. 101.* (W)

152. Mammalian Physiology Laboratory 1 (4)

Topics covered will include membrane physiology, nerve-muscle function, cardiovascular physiology, and endocrine physiology. Cell and organ functions are studied in humans and experimental animals. One hour of lecture, one hour of discussion, and ten hours of laboratory. *Prerequisites: consent of instructor and Biol. 151 (may be taken concurrently).* (W) **Note: Students will be admitted to Biology 152 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

153. 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: Biol. 151 or consent of instructor.* (S)

154. Mammalian Physiology Laboratory 2 (4)

Experiments are performed on the respiratory, excretory, and gastrointestinal systems in experimental animals and humans. One hour of lecture, one hour of discussion, and ten hours of laboratory. *Prerequisites: consent of instructor and Biol. 153 (may be taken concurrently).* (S) **Note: Students will be admitted to Biology 154 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior to the second day of T-Reg will not be considered for priority preference.** 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.

155. 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: Biol. 1, Biol. 2, and Chem. 6A-B-C or Chem. 7A-B.* (W)

156. Neurobiology (4)

An examination of the properties and functions of individual nerve cells as well as mechanisms of sensory and motor integration. This course open to upper-division students only. Three hours of lecture and one hour of section per week. *Prerequisites: Biol. 1, Biol. 2, and Biol. 101.* (F)

157. 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. *Students must be interviewed by instructors before registering in this course. Prerequisite: Biol. 156 (may be taken concurrently).* (F)

Note: Students will be admitted to Biology 157 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior the second day of T-Reg will not be considered for priority preference. 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.

■ ECOLOGY, BEHAVIOR, AND EVOLUTION

160. 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, resampling methods, and experimental design. Students will be introduced to statistical software on the Macintosh computer. Three hours of lecture and two hours of section. *Prerequisite: Biol. 3.* (F) **NOTE:** Students may not receive credit for Biology 160 after having taken Biology 168/168L.

162. 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: Biol. 160 (may be taken concurrently).* (W)

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: Biol. 3.* (S) (Not offered in 1990-91.)

166. Animal Communication (4)

The study of the evolution of communication in animals, including ethological approaches to communication, mechanisms of signal generation, propagation and detection, and economic theories of signal function and evolution. Three hours of lecture and one hour of section. *Prerequisite: Biol. 3.* (W)

167. 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: Biol. 3 or equivalent.* (W)

169. 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 captive species. This course introduces the subject in the context of case studies. Three hours of lecture and two hours of discussion. *Prerequisite: Biol. 3* (S)

170. 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: Biol. 160 and Biol. 162 (may be taken concurrently).* **Note: Students will be admitted to Biology 170 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior the second day of T-Reg will not be considered for priority preference.** (W)

171. 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 lec-

ture and eight hours of lab. *Prerequisites: Biol. 160 and Biol. 166.* **Note: Students will be admitted to Biology 171 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior the second day of T-Reg will not be considered for priority preference.** (W)

172. 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: Biol. 160 and Biol. 164.* **Note: Students will be admitted to Biology 172 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior the second day of T-Reg will not be considered for priority preference.** (S) (Not offered in 1990-91.)

173. 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: Biol. 169.* **Note: Students will be admitted to Biology 173 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to**

the Biology Office prior the second day of T-Reg will not be considered for priority preference.

174. 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: Biol. 131; Biology 160 recommended.* (W)

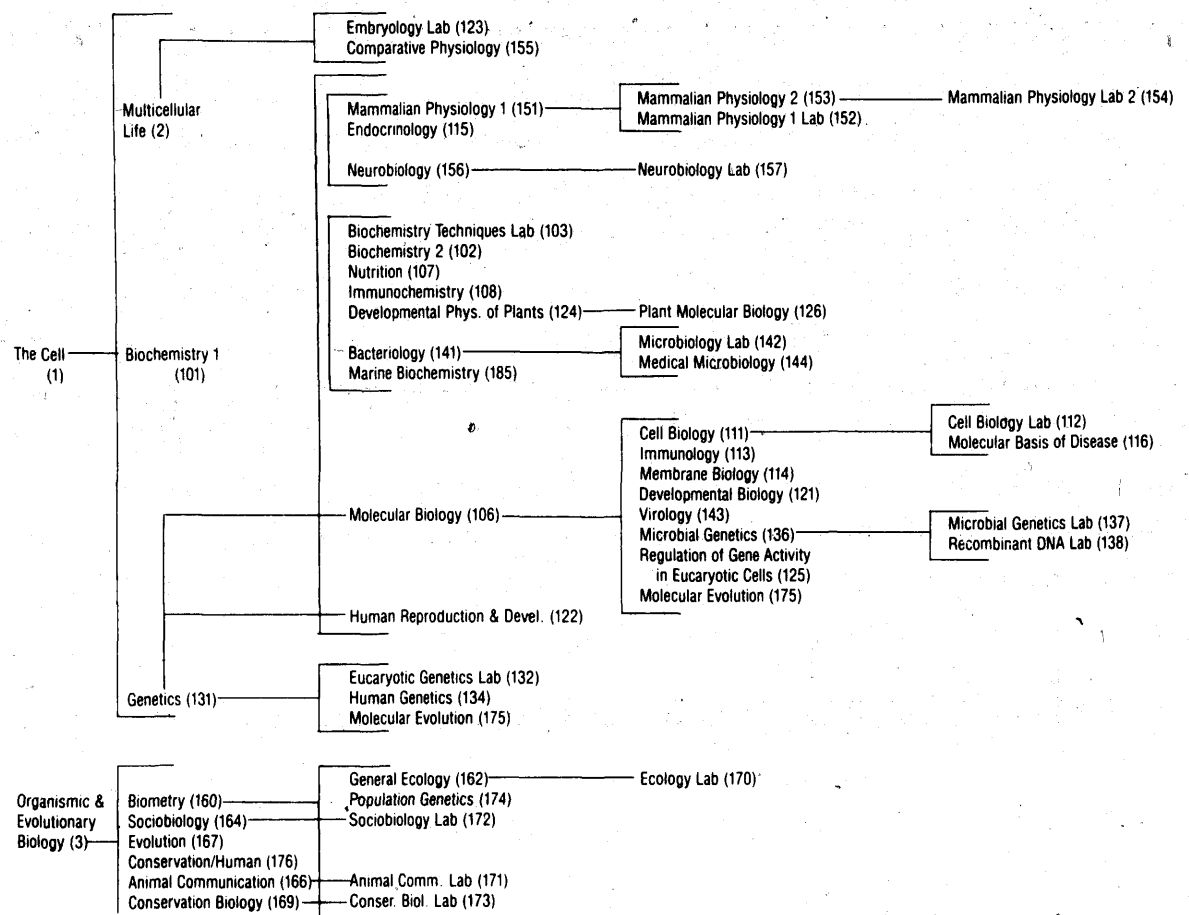
175. Molecular Evolution (4)

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: Biol. 101, 131, and 106.* (F)

176. Conservation and the Human Predicament (4)

(Cross-listed with Anthropology 132; however, biology majors **must** take the course as Biology 176.) This course is an interdisciplinary discussion of the human predicament, the biodiversity crisis, and the importance of biological and environmental conservation in sustaining future societies. Using lectures and case studies we will explore the consequences of habitat destruction and species extinctions on the biosphere and the welfare of humans. Although the course has strong biological underpinnings, the intent is to explore the cultural, social, economic, and political implications of international wildlife and habitat conservation. Three hours of lecture

Prerequisite Flow Chart for Undergraduate Biology Courses



In addition to satisfying the prerequisites, students must also have the instructor's consent to enroll in the following courses: Biol. 142, Biol. 157.

NOTE: Students are admitted to the upper-division lab courses on a priority basis. For additional information, please call (619) 534-2786, or go to room 2322, Humanities and Social Sciences Building.

Students are expected to satisfy the prerequisite requirement prior to enrolling in a course. The only exceptions are those courses in which the prerequisites may be taken concurrently.

and one hour of discussion. *Prerequisite: Biol. 3 or consent of instructor.* (S)

■ SPECIAL COURSES

181. 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. 2A and 2B, or equivalent.* (NOTE: Students may not receive credit for both Biol. 181 and Chem. 134.) **Note: Students will be admitted to Biology 181 on a priority basis only. Go to room 2322, Humanities and Social Sciences Building, prior to the preferred enrollment date for information. Students who do not submit an add card to the Biology Office prior the second day of T-Reg will not be considered for priority preference.** (F)

185. 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: Biol. 101 or Chem. 114B or consent of instructor.* (F)

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 Biol. 199, or consent of instructor.* (F,W,S)

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 chairperson.* 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 Biology 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.**

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)

198. Directed Group Study (2 or 4)

This course will cover a variety of directed group studies in areas not covered by formal departmental courses. (P/NP grades only.) *Prerequisite: upper-division standing.* (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.) *Prerequisites: overall UCSD GPA of at least 3.0, minimum of ninety*

units, consent of instructor, and approval by department chairperson. NOTE: Applications for a Biology 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 Biology 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.**

GRADUATE

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)

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)

202. Seminar in Developmental Biology (1)

Seminars presented by graduate students which will explore topics in specialized areas of developmental biology and 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.)

203. Seminar in Immunology (1)

The course involves weekly seminars given by faculty, postdoctoral 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.) (W)

204. Seminar in Population Biology (1)

Weekly meetings to review current literature on a specified topic in ecology, evolution, or population genetics. Interested students should check with population biology office prior to each quarter for topic. Open to qualified undergraduates as well as graduate students with consent of instructor. (F,W)

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)

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)

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)

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)

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 presentation. Only open to biology graduate students. (S/U grades only.) (F,W,S)

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: Biol. 131.* (S/U grades only.) (Quarter variable and not offered every year.)

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: Biol. 101 and Biol. 131.* (S/U grades permitted.)

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)

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)

215. Special Topics in Molecular Biophysics (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. (For example, faculty who have participated in one of the international summer schools may wish to repeat their lectures here.) 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.) (F,W,S)

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: Biol. 101, Biol. 106, and Biol. 131 or the equivalent.* (S/U grades only.) (F)

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: Biol. 101, 106, 111, and 131 or the equivalent.* (S/U grades only.) (F)

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. (S/U grades only.) (W)

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. (S/U grades only.) (S)

223B. Advanced Animal Virology (3)

The course follows Biology 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. (S/U grades only.) (S)

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. (S/U grades only.) (S)

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: Biol. 221A, 221B, and 222.* (S/U grades only.) (S)

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: Biol. 221A, 221B, and 222.* (S/U grades only.) (S)

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 the instructor.* (S/U grades only.) (W)

232. Virology (3)

This course consists of an in-depth review of selected topics in virology with emphasis on the molecular biology of animal virus multiplication. The format will include lectures and discussion of selected papers. Six hours of class meeting for five weeks. *Prerequisite: Biol. 106 or the equivalent.* (S/U grades permitted.) (W)

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 (Biology 113), and by graduate students. (S/U grades permitted.) (S)

234. Advanced Cellular Neurobiology (3)

Neural cell types and systematic relationships. Developmental concepts and survey of selected parts of the nervous system. Determination versus expression of neuronal characteristics. Extrinsic cues from cellular and humoral environments, cultural approaches. Bioelectric and biochemical properties of neurons and glia. Axonal growth and formation of synapses. Neuroglia interactions. *Prerequisite: consent of instructor.* (S/U grades permitted.)

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.) (W)

241. Membrane Neurophysiology and Biophysics (3)

Morphological, biochemical molecular, and physiological basis for testing potentials, receptor potentials, synaptic potentials, and action potentials. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 242 and 243.)

242. Cellular and Synaptic Neurophysiology (3)

Factors which influence the establishment and maintenance of cellular and synaptic function in the nervous system. Emphasis on cellular, developmental, and molecular neurobiology. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 241 and 243.) (Not offered in 1990-91.)

243. Systems Neurophysiology (3)

Ways in which neurons are assembled into circuits to achieve perception and patterned movement. (S/U grades only.) (S) (Offered in a three-year cycle with Biology 241 and 242.)

244. Topics in Developmental Neurobiology (3)

Weekly presentations of recent papers on the development of the nervous system. (S/U grades only.) (W)

245. Readings in Neurobiology (3)

Weekly presentation by faculty and students of recent journal articles. (S/U grades only.) (F,S)

246. Neurobiology Seminar (3)

Presentation of current research by local and visiting neurobiologists. (S/U grades only.) (F,W,S)

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)

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)

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 Biology 113 but is accelerated in pace. (S/U grades permitted.) (F)

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)

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 scientist, clinicians, and students. *Prerequisites: graduate students only, Biol. 251, Biol. 252, Biol. 253, and Biol. 254 to be taken simultaneously.* (S/U grades only.) (F)

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 chairperson.* (Letter grades only.) (F,W,S) NOTE: Applications for a Biology 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 Biology 271 will be completed. No Biology 271 application forms will be accepted after that date.

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)

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)

299. Thesis Research in Biology (1-12)

(F,W,S)

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)

BIOPHYSICS

OFFICES:

General Administration—3406 Mayer Hall
 Graduate Student Affairs—3413 Mayer Hall
 Undergraduate Student Affairs—3430 Mayer Hall
 Chairman's Office—3422 Mayer Hall

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.

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) Biology 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) Biology 101, 103, 106, 111, 131. (4) Mathematics 110.

c. Suggested schedule is:

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Biol. 131	
Phys. 110A	Math. 110	Phys. 120A
Chem. 140A	Chem. 140B	Chem. 143A
SENIOR YEAR		
Phys. 130A	Phys. 130B	Phys. 153
Phys. 120B	Chem. 131	Biol. 103
Biol. 101	Biol. 106	Biol. 111

PHYSICS MAJOR WITH SPECIALIZATION IN BIOPHYSICS-PREMEDICAL

The upper-division program for physics majors with specialization in biophysics-premedical is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent arrangement of the upper-division program will be devised by consultation between the student and the physics departmental adviser for biophysics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major with specialization in biophysics-premedical:

- a. Lower-division:
 - (1) Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended).
 - (2) Chemistry 6A-B-C, or 7A-B; and Chemistry 6BL-CL.
 - (3) Biology 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) Biology 101, 106, 111, 131. (4) Mathematics 110. (5) Restricted elective: one biology course (Biology 121, 122, or 125).

c. Suggested schedule:

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Math. 110	
Phys. 110A	Biol. 131	Phys. 120A
Chem. 140A	Chem. 140B	Chem. 143A

SENIOR YEAR		
Phys. 120B		Phys. 153
Phys. 130A	Chem. 126 or 131	Restr. Elec.
Biol. 101	Biol. 106	Biol. 111

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.

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. 203A (Adv. Classical Electrodynamics)
- Math. 210A (Mathematical Methods)

Winter

- Phys. 200B (Theoretical Mechanics)
- Phys. 203B (Adv. Classical Electrodynamics)
- Phys. 212A (Quantum Mechanics)

Spring

- Phys. 210A (Statistical Mechanics)
- Phys. 212B (Quantum Mechanics)
- Math. 210C (Mathematical Methods)

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 in-

cluded 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 department chairman.)

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

Chairman's Office: 2112 Urey Hall
 Revelle College
 (619) 534-3575

Student Affairs: 1001 Urey Hall
 Revelle College
 (619) 534-6870

Professors

- William S. Allison, Ph.D.
- James R. Arnold, Ph.D.
- Edward A. Dennis, Ph.D.
- Russell F. Doolittle, Ph.D.
- Robert C. Fahey, Ph.D.
- 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.
- Joseph Kraut, Ph.D.
- Jack Kyte, Ph.D.
- Katja Lindenberg, Ph.D.
- 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.
- Hans E. Suess, Ph.D., *Professor Emeritus*
- Susan Taylor, Ph.D.
- Mark Thiemens, Ph.D.
- Teddy G. Traylor, Ph.D.
- William C. Trogler, Ph.D.
- Roger Y. Tsien, Ph.D.
- Regitze R. Vold, Ph.D.
- Robert L. Vold, Ph.D.
- Joseph W. Watson, Ph.D., *Vice Chancellor, Undergraduate Affairs*
- John H. Weare, Ph.D.
- Ernest Wenkert, Ph.D., *Chairman*
- John C. Wheeler, Ph.D.
- Kent R. Wilson, Ph.D.
- Bruno H. Zimm, Ph.D.

Associate Professors

- F. Thomas Bond, Ph.D., *Provost, Revelle College*
- Leigh B. Clark, Ph.D.
- Daniel J. Donoghue, Ph.D.
- John D. Simon, Ph.D.
- T. Don Tilley, Ph.D.

Assistant Professors

- Adrienne Brian, Ph.D.
- John E. Crowell, Ph.D.
- Daniel F. Harvey, Ph.D.
- Andrew C. Kummel, Ph.D.
- Joseph O'Connor, Ph.D.
- David A. Roise, Ph.D.
- Jay Siegel, Ph.D.

Adjunct Professors

Robert W. Holley, Ph.D.
 Frank M. Huennekens, Ph.D.
 Leslie E. Orgel, Ph.D.
 Frederick T. Wall, 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, embrace 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
 M.S. Chemistry
 Ph.D. Chemistry

Division of Chemistry

B.A. Chemistry
 B.A. Chemistry/Chemical Physics
 B.A. Chemistry/Earth Sciences
 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 recom-

mends. The Chemistry Honors sequence (7A-7B) is designed for science and engineering majors with strong preparation in science and mathematics who can work at a very rapid pace and complete the introductory curriculum in two quarters. A student intending to major in chemistry can thus begin with 4, 6A or 7A, 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 sequence 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. One year of physics (Phys. 2A-B-D* preferably, or Phys. 1A-B-C). Two units of physics laboratory. Phys. 1AL, 1CL is recommended because of the diversity of topics treated. Phys. 1CL is accessible without Phys. 2C.
3. Calculus through Math. 2D (differential equations), either Math. 2A, 2B, 2C, 2D or Math. 1A, 1B, 1C, 2C (two units), 2D.
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.

*Phys. 2C is not required.

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 four advanced biochemistry courses in the senior year. These four 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. 143A-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.
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.

Chem. 199 may not be used as a required or elective course for the major. Students are encouraged, however, to take Chem. 199 in their senior year in addition to the above required courses. Any departure from these requirements must be approved by petition. The following schedule is only an example.

SUGGESTED PROGRAM FOR CHEMISTRY/BIOCHEMISTRY 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. 143A Math. 2D	Chem. 141B Chem. 143B Phys. 2A Phys. 1AL	Chem. 141C Biol. 1* Phys. 2B Phys. 1CL

CHEMISTRY

JUNIOR YEAR		
Chem. 114A	Chem. 114B	Chem. 114C
Chem. 126	Chem. 127	Chem. 105A
Phys. 2D	Chem. 112A**	
SENIOR YEAR		
Chem. 120A	Elective Lab	
Elective	Elective	Elective

*Recommended for premedical students, but not required.
**or 112B in the spring.

DIVISION OF CHEMISTRY CHEMISTRY MAJOR

The upper-division requirements for the chemistry major are:

1. One year of physical chemistry (130, 131, 132). 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. Five laboratory courses (Chem. 143A-B, 105A and two of the following: Chem. 106, 112A, 123, 143C, or 105B).
5. Four additional four-unit upper-division or graduate courses in chemistry or related areas. At least three of these courses must be other than 195 or 199.

SUGGESTED PROGRAM FOR CHEMISTRY 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. 143A	Chem. 143B	
Math. 2D	Phys. 2A	Phys. 2B
	Phys. 1AL	Phys. 1CL
JUNIOR YEAR		
Phys. 2D	Chem. 131	Chem. 132
Chem. 120A	Chem. 120B	Elective Lab
SENIOR YEAR		
Chem. 130	Elective Lab	Elective
Chem. 105A	Elective	Elective
Elective		

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 or Phys. 3A-3D, Chem. 7A-7B or Chem. 6A-6C, and the Math. 2 sequence through 2F or 3E by the end of the sophomore year, along with the lower-division labs Chem. 6BL, 6CL and Physics 1AL, 1CL, or equivalent. The upper-division requirements are the same as for the chemistry major, except: Chem. 141C is not required. 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. Chem. 195 and 199 are valuable additions, but are not applicable to the above requirements.

SUGGESTED PROGRAM FOR CHEMISTRY/CHEMICAL PHYSICS MAJOR:

FALL	WINTER	SPRING
FRESHMAN YEAR		
Chem. 6A	Chem. 6B	Chem. 6C
	Phys. 2A	Phys. 2B
	Chem. 6BL	Phys. 1AL
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	Phys. 1CL	
JUNIOR YEAR		
Chem. 130	Chem. 131	Chem. 132
	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

CHEMISTRY MAJOR WITH SPECIALIZATION IN EARTH SCIENCES

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. 130, 131, 132; Chem. 120A, 120B. The five upper-division labs

are: 105A, 106, 143A, SIO 256L 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 SIO 256A, Field Geology. At least two other courses from the following list are required: SIO 244, 245A, 245B, 253, Chem. 170, 171, 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 professional geologic work with their undergraduate degrees. The courses should be taken in the order given in the suggested program.

SUGGESTED PROGRAM FOR CHEMISTRY/EARTH SCIENCES 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. 143A
Math. 2D	Phys. 2A	Phys. 2B
	Phys. 1AL	Phys. 1CL
JUNIOR YEAR		
E.S. 101	E.S. 103	E.S. 102
Phys. 2D	Chem. 131	Chem. 132
Chem. 120A	Chem. 120B	Chem. 105A
SENIOR YEAR		
Chem. 130	Chem. 106	Elective
E.S. 120	SIO 256A	Elective Lab
Elective	SIO 256L	

HONORS PROGRAM

The Department of Chemistry offers an Honors Program to those students who have demonstrated excellence in any of the four 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 199H, Honors Research in Chemistry, distributed over at least two quarters. These units must be in addition to the ordinary major re-

quirements. However, a student who registers for 199H 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 Professors David Roise, Jay Siegel, or John Simon 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 1001 Urey 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 preparation 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,W)

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. General 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 intro-

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duction 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 (2)

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,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.* (F)

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).* (W)

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)

UPPER DIVISION

102A. Thermodynamics (4)

Thermodynamics of chemical systems, the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium. Solutions. Intended as a preparation for Chem. 204A. *Prerequisites: Chem. 131, 132, or equivalent.* (F)

105A. Physical Chemistry Laboratory (2)

Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 6CL and Phys. 1CL or equivalent, Chem. 130 or 131 or 126 or 127.* (F,W,S)

105B. Physical Chemistry Laboratory (2)

Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 105A and 130.* (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.* (W)

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).* (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.* (S)

114A. Biochemical Structure and Function (4)

Introduction to biochemistry from a structural and functional viewpoint. *Prerequisite: elementary organic chemistry (which may be taken concurrently).* (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 101.) (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 106.) (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.* (W)

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.* (W)

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.* (S)

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.* (S)

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.* (W)

123. Inorganic Chemistry Laboratory (4)

Synthesis, analysis, and physical characterization of inorganic chemical compounds. *Prerequisite: Chem. 143B or Chem. 105A.*

126. Physical Chemistry (4)

Thermodynamics, first and second laws, thermochemistry, chemical equilibrium, phase equilibrium, solutions. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C or consent of instructor.* (NOTE: Students may not receive credit for both 126 and 131.) (May not be offered every year.)

127. Physical Chemistry (4)

Electrochemistry, kinetic theory, quantum theory, and reaction kinetics. *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 (4)

Statistical mechanics, atomic and molecular structure, spectroscopy, solids, x-ray diffraction. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, Chem. 127, or consent of instructor.* (S)

130. 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.* (F)

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 126 and 131.) (W)

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 127 and 132.) (S)

133. Elementary Statistical Thermodynamics (4)

Equilibrium, distribution functions, development of partition functions; derivation of thermodynamic properties of simple systems from partition functions. *Prerequisites: Chem. 130, 131, 132, Math. 2D.* (W)

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. Spectroscopy and Structure (4)

The interaction of electromagnetic radiation with molecules and bulk matter, x-ray and optical scattering; electronic, vibrational and rotational spectroscopy; nuclear and electron magnetic resonance. Emphasis will be placed on the quantum mechanical interpretation of experimental data. *Prerequisite: Chem. 130. (S)*

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. (Not 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)*

143B. Organic Chemistry Laboratory (2)

Continuation of 143A, emphasizing synthetic methods of organic chemistry. *Prerequisites: Chem. 143A, 141B, or 140B (may be taken concurrently). (W)*

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). (S)*

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. (F)*

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.*

149A. Environmental Chemistry (4)

The chemical basis of air and water pollution, solid waste disposal, energy and mineral resource usage, agricultural productivity and biological toxicity. *Prerequisite: introductory chemistry. (F)*

167. Biochemistry of Lipid Diseases (4)

The metabolism of lipids from the basic biochemistry to human disease implications will be the central theme of this course. The aim will be first to develop a broad understanding of the basic biochemical aspects of lipid metabolism including structural aspects of lipids and lipoproteins and mechanistic aspects of the enzymes that act upon them. Then the regulation of lipid metabolism and the implications for disease states will be considered. Finally, the application of these ideas to the treatment of specific human diseases will be discussed.

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. (Not offered every year.)*

190. Mathematical Methods of Chemistry (4)

Applied mathematics useful for kinetics, thermodynamics, statistical mechanics and quantum mechanics. Topics include ordinary and partial differential equations, special functions, probability and statistics, vector functions and operators, linear algebra, and group theory. *Prerequisites: general chemistry, one year of calculus. (Not offered every year.)*

195. Chemistry Instruction (4)

Introduction to the teaching of elementary college chemistry. Each student will be responsible for and teach a class section of one of the lower-division chemistry courses. Limited to upper-division chemistry majors who have maintained a B average or better in their major course work. One meeting per week with instructor, one meeting per week with assigned class section, and attendance at lecture of the lower-division course in which the student is participating. (P/NP grades only.) *Prerequisite: consent of instructor. (F,W,S)*

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)*

199H. Honors Research in Chemistry (2 or 4)

Independent research for students accepted to the chemistry honors program. Students must register on a P/NP basis. *Prerequisite: acceptance into the chemistry honors program. (F,W,S)*

GRADUATE

200A-B. Molecular Quantum Mechanics (4-4)

The fundamental concepts and techniques of quantum mechanics which are useful for problems of chemical interest are developed and applied to the structure, spectra, and properties of molecules. *Prerequisite: an introduction to quantum mechanics as in a physical chemistry course, for example, Chem. 130. A good background in mathematics is helpful, for example, Chem. 190. (F,W; not offered every year.)*

202A. Thermodynamics (4)

Thermodynamics of chemical systems; the three laws, with emphasis on the formal structure of thermodynamics. Chemical equilibrium, stability theory, heterogeneous equilibrium, solutions. Intended as a preparation for Chem. 204A. *Prerequisites: Chem. 131, 132, or equivalent. (F)*

204A. Statistical Mechanics of Chemical Systems (4)

Equilibrium statistical mechanics, derivation of the formal ensemble equations and the laws of thermodynamics from the principles of classical and quantum mechanics, the relations between the different ensembles, the use of the equations for various chemical systems, gases, crystals, and liquids. *Prerequisite: Chem. 133 or equivalent, or consent of instructor. (S)*

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.

209. 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, and advanced topics in statistical mechanics, thermodynamics, and chemical kinetics. (S/U grades permitted.)

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 the organization, critical evaluations, and oral presentation of information from the literature. Each quarter a different topic is discussed; recent topics have included: lipids, membranes, oxidative phosphorylation, nucleic acid structure, function, and synthesis, protein structure and function, history of biochemistry.

211. 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)

This course provides a thorough introduction to the biochemistry of growth regulation and oncogenesis in eukaryotic cells. Topics include: serine-threonine specific protein kinases; tryptophan protein kinases; growth factors; growth factor receptors; mechanisms of signal transduction; control of cell proliferation; hormonal regulation of gene expression; transformation by papovaviruses and retroviruses; and the isolation and characterization of oncogenes. This course is designed primarily for first- and second-year graduate students in the biochemical sciences; however, this course is suitable for undergraduates with the 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.* (F)

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.*

215. Nutritional Biochemistry (2)

The biochemical basis of human nutrition will be emphasized. *Prerequisites: Chem. 211, which may be taken concurrently; graduate-student standing.*

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.* (W)

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. Biochemistry II (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.*

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.*

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.*

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.*

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.

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.

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.

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)

235. Spectroscopy and Structure (4)

The interaction of electromagnetic radiation with molecules and bulk matter: x-ray and optical scattering; electronic, vibrational, and rotational spectroscopy; nuclear and electron magnetic resonance. Emphasis will be placed on the interpretation of experimental data.

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. Topics will include: A review of basic lipid and lipoprotein metabolism; phospholipid metabolism and the prostaglandins; the relationship of coronary heart disease to genetic hyperlipoproteinemia, and possible therapeutic approaches to atherosclerosis. Two-hour lectures. Same as Medicine 236. *Prerequisite: biochemistry.*

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.*

244. Synthesis of Complex Molecules (4)

In order to plan the most economic synthesis of an organic molecule, one must consider many possible routes. The arguments used to weigh one route against another will be discussed in detail. The uses of specific reagents and protecting groups will be outlined. The control of stereochemistry during a synthesis will be emphasized. Examples will be selected from the recent literature. *Prerequisite: Chem. 148 or 248.*

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.

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.

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.*

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.*

249. Special Topics in Organic Chemistry (2-4)

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.)

267. Biochemistry of Lipid and Lipoprotein Diseases (4)

This course will cover the metabolism of lipids and lipoproteins from the basic biochemistry to human disease implications. The aim of the course will be to first develop a broad understanding of the basic biochemical aspects of lipid metabolism including structural aspects of lipids and lipoproteins and mechanistic aspects of the enzymes that act upon them. Then the regulation of lipid metabolism and the implications for disease states will be considered. Finally, the application of these ideas to the treatment of specific human diseases will be discussed.

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.*

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.) (F,W,S)

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.) (F,W,S)

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)

CHICANO STUDIES

OFFICE: 121 Third College Humanities Building

Faculty

Carlos Blanco, Ph.D., *Professor of Literature and Third World Studies*

Tony Curiel, M.A., *Assistant Professor of Theatre*

Claudio Fenner-Lopez, M.F.A., *Lecturer in Communication with Security of Employment*

Gloria Fimbres, *Lecturer, Supervisor, Teacher Education*

Ramon Gutierrez, Ph.D., *Professor of History*

Jorge Huerta, Ph.D., *Professor of Drama*

David Mares, Ph.D., *Associate Professor of Political Science*

George Mariscal, Ph.D., *Assistant Professor of Literature*

Michael P. Monteon, Ph.D., *Associate Professor of History*

Ramon Ruiz, Ph.D., *Professor of History*

Marta Sanchez, Ph.D., *Associate Professor of Literature and Third World Studies*

Rosaura Sanchez, Ph.D., *Associate Professor of Literature and Third World Studies*

Faustina Solis, M.S.W., *Professor of Urban Studies; Community and Family Medicine*

THE MAJOR

The Chicano studies major is a joint major. As such, it has a disciplinary emphasis, i.e., it is worked out jointly with a UCSD department. The disciplinary emphasis will be the foundation for systematic study of the Chicano experience. Knowledge of the total context of the Chicano experience will also be developed through study in other disciplines and study of the Spanish language. Students may enter the program with a basic knowledge of Spanish (as obtained, for instance, in the language program), but a fluent knowledge of Spanish will be expected of all majors.

Majors will be advised by the Chicano studies staff and departmental staff.

At present it is possible to receive the following degrees in Chicano studies at UCSD:

B.A. degree in history and Chicano studies

B.A. degree in Chicano studies with a literature emphasis

Changes in the curriculum and major/minor requirements may occur as the Program in Ethnic Studies is developed. Please consult with the undergraduate adviser regarding new requirements.

HISTORY/CHICANO STUDIES MAJOR

Two sets of requirements are necessary:

1. History requirements

Three lower-division courses:

7A-7B-7C Sequence in Race and Ethnicity

Twelve upper-division history courses:

seven in field of concentration (Western-Hemisphere), three in different field (i.e., Europe, Non-Western), two in remaining field (i.e., Europe, Non-Western)

2. Chicano studies requirements

Spanish fluency

Three upper-division courses in history (as part of the twelve courses required by Department of History)

Three upper-division Chicano studies courses outside of history

LITERATURE/CHICANO STUDIES MAJOR

Two sets of requirements are necessary:

1. Literature requirements

Lower-division courses:

These will vary depending on the program of concentration.

Twelve upper-division literature courses:

These will vary depending on program of concentration.

2. Chicano studies requirements

Spanish fluency

Three upper-division Chicano studies courses in literature (as part of the twelve courses required by Department of Literature)

Three upper-division Chicano studies courses outside of literature

A limited number of independent studies, based on consultation with a faculty member or program adviser, are applicable toward the majors.

THE MINOR

The Chicano Studies Program has a minor program, which is interdisciplinary and provides students with a breadth of understanding of Chicano issues.

Students will be able to satisfy their minor by taking six courses. At least three of the courses must be upper-division. The following courses are applicable toward the minor.

LOWER-DIVISION COURSES

Theatre-Chicano Studies 15: Introduction to Chicano Theatre

Literature-Spanish 2B: Composition and Conversation

Literature-Spanish 2A: Readings and Interpretations

History-Chicano Studies 7C: Race and Ethnicity in the U.S.

UPPER-DIVISION COURSES

Theatre-Chicano Studies 142: Chicano Dramatic Literature

Literature-Chicano Studies 162/143: Spanish Language in the U.S.

Lit/Sp-Chicano Studies 150: Development of Chicano Literature

Lit/Sp 151: Themes and Motifs in Chicano Literature

Lit/Sp-Chicano Studies 152: Chicano Prose

Lit/Sp-Chicano Studies 153: Chicano Poetry

Lit/Sp 154: Chicano Theatre

History-Chicano Studies 155A: Social Economic History of the Southwest

History-Chicano Studies 155B: Social Economic History of the Southwest

History-Chicano Studies 155Q: Colloquium on Mexican-American History

Theatre-Chicano Studies 187A/137A: Ensemble: Chicano Teatro

Theatre-Chicano Studies 187B/137B: Ensemble:
Chicano Teatro

Courses

- 7C. Race and Ethnicity in the United States (4)**
(Same as TWS/History 7C.) A lecture-discussion course on the comparative ethnic history of the U.S. 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.
- 15. Introduction to Contemporary Chicano Theatre (4)**
(Same as Theatre 15.) A study of the history and growth of Chicano theatre, focusing on contemporary Chicano teatro and playwrights.
- 105. Urban Studies in International Perspective: The U.S.-Mexico Border Region**
(Same as Urban Studies 105.) Course analyzes urban and regional development theory in the context of the U.S.-Mexico international border area. Explores concepts of urban systems, regional inequality, planning, economic base, transportation, land use, local politics, and twin cities. Department stamp required. *Prerequisite: upper-division standing or consent of instructor.*
- 132. La Chicana (4)**
(Same as Third World Studies 137.) A clinical perspective of the Chicana's present minority status through an exploration of relevant crucial issues (i.e., employment, education, health, family). *Prerequisite: upper-division standing.*
- 134L. Introduction to Chicano Politics (4)**
(Same as Poli. Sci. 134L.) A survey of Chicano and Latino political activity and ideas. The framework of ethnicity and United States politics will be examined, and Chicanos will be compared to other Latino subgroups and blacks. Topics covered will include Chicano political history; the political and policy implications of Chicano demographic, social, and ideological change; religion and politics in the Chicano community; Chicano-Mexican relations, and the emergence of an Hispanic political identity.
- 134M. Seminar: Chicano Political Research (4)**
(Same as Poli. Sci. 134M.) This course is an examination and critique of approaches to political and policy-related research on Chicanos. Topics covered will include political and theoretical analysis of Chicano historiography; theories of inequality and ethnicity as applied to Chicanos; research on Chicano political participation, public opinion, political elites and organizations; and the policy research program of Hispanic politics.
- 137A. Ensemble: _____ (4)**
(Same as Theatre 187A.) 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, commedia d'ell arte theatre. *Prerequisites: Department of Theatre stamp required. Audition may be required.* (Course pertaining directly to Chicano studies applicable only.)
- 137B. Ensemble: _____ (4)**
(Same as Theatre 187B.) An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon explorations of ensemble, rehearsal process, the development of technical self-support systems, the extension of performance modes, and performer-event-audience relationships. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia d'ell arte theatre. *Department of Theatre stamp required. Audition may be required.*

Prerequisite: Chicano studies 137A/Theatre 187A. (Course pertaining directly to Chicano studies applicable only.)

- 142. Chicano Dramatic Literature (4)**
(Same as Theatre 142.) Focusing on the contemporary evolution of Chicano dramatic literature, this course will analyze the playwrights and theatre groups that express the Chicano experience in the United States. Relevant "actos," plays and documentaries will be examined for their contributions to the developing Chicano theatre movement. *Prerequisites: upper-division standing and consent of instructor. Chicano Studies 15 or Theatre 15 recommended.*
- 150. Development of Chicano Literature (4)**
(Same as Lit/Sp 150 and TWS 150.) A cross-genre survey of the major works in Chicano literature from its beginning to the present, with primary emphasis on contemporary works. *Prerequisite: upper-division standing or consent of instructor.*
- 152. Chicano Prose (4)**
(Same as Lit/Sp 154 and TWS 154.) A study of the different genres of Chicano prose: essay, novel, short story, autobiography. Attention is given to the development of Chicano prose styles and the historical and cultural movement in which these forms develop.
- 153. Introduction to Chicano Literature (4)**
This course introduces students to the particular life experience of the Chicano and the unique expression given that experience by Chicano authors, whether in novels, short stories, poetry, or dramatics works. *Prerequisite: speaking and reading knowledge of Spanish or consent of instructor.*
- 154. Chicano Poetry (4)**
(Same as Lit/Sp 153 and TWS 155.) 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. *Prerequisite: upper-division standing or consent of instructor.*
- 155A. Social and Economic History of the Southwest (4)**
(Same as HIUS 158.) An introduction to American borderland history with special emphasis on historiography, economic and social developments of the border states during the eighteenth and nineteenth centuries. The course is designed to present various interpretations of American southwestern history.
- 155B. Social and Economic History of the Southwest (4)**
(Same as HIUS-159.) The course will consider the significant trends in Mexican-American history over the past one hundred years in the Southwest. Special emphasis will be placed upon primary documents relating to Mexican-Americans in economic and social institutions.
- 155Q. Colloquium in Mexican-American History (4)**
(Same as HIUS 167.) This course will examine the historical literature concerned with the Mexican-American people in the United States. Specific topics of discussion will include immigration, urbanization, and assimilation of this population from the mid-nineteenth century to the present. *Prerequisite: upper-division standing or consent of instructor.*
- 198. Directed Group Study (4)**
Directed group study on a topic or in a field not included in the regular academic curriculum, by special arrangement with a faculty member. (P/NP grades only.) *Prerequisites: upper-division standing and consent of instructor.* (F,W,S)
- 199. Independent Study (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)

Related course offerings in other departments:

History

146A-B. A History of Mexico (4-4)
The first quarter covers the period from the conquest through the Revolution of 1910. The second quarter covers the period since 1910.

Literature

- Lit/Sp 135. Mexican Literature (4)**
Study of popular novels, movements, traditions, key authors, or major trends in modern Mexican literature.
- Lit/Sp 166. Creative Writing (4)**
A workshop designed to foster and encourage writing in Spanish of students working on short forms of fiction.

Students wishing to include additional related courses from these or other departments should consult a Chicano studies adviser.

CHINESE STUDIES

OFFICE: 3084 Humanities and Social Sciences Building, Muir College

Professors

Joseph C.Y. Chen, Ph.D., *Physics*
Matthew Y. Chen, Ph.D., *Linguistics, Chairman*
David K. Jordan, Ph.D., *Anthropology*
Richard P. Madsen, Ph.D., *Sociology*
Thomas A. Metzger, Ph.D., *History*
Paul G. Pickowicz, Ph.D., *History*
William S. Tay, Ph.D., *Literature*
Wai-Lim Yip, Ph.D., *Literature*

Associate Professor

Susan L. Shirk, Ph.D., *Political Science*

Assistant Professors

Tun-jen Cheng, Ph.D., *IR/PS*
Barry J. Naughton, Ph.D., *IR/PS*

Lecturer

Ping C. Hu, M.A., *WSOE, Chinese*

Visiting Lecturer

Zheng-sheng Zhang, Ph.D., *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 chairperson, EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

THE MAJOR PROGRAM

The student choosing a major in Chinese studies must meet the following requirements:

1. Two years of Mandarin Chinese (Chinese Studies 11, 12, 13 and 21, 22, 23 or equivalent).
2. 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.
3. As a rule, only courses taken for a letter grade can satisfy program requirements (major, minor). Exceptions are granted for Chinese Studies 199s.

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 1989-90 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 in the course of 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. Three Chinese language courses 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)**

150. **Intensive Summer Language Cultural 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 village, 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 will be an introduction to linguistics for students of the Chinese language. It will cover phonological and grammatical structures, dialectology, and a brief survey of the history of the language. (Not offered in 1990-91.)

170. **History of Science in China (4)**

This course is designed to provide a coherent picture of aspects of the development of science in Chinese civilization from ancient times through the eighteenth century. The focus (mathematics, astronomy, medicine, chemistry, etc.) will shift from year to year.

181A. **Introduction to Classical Chinese (4)**

Introduction to the classical language through Confucius, Mencius, and the other Great Books. The emphasis will be on comprehension and reading ability. *Prerequisite: Chinese Studies 23 or equivalent.*

181B. **Introduction to Classical Chinese (4)**

Continuation of Chinese Studies 181A. *Prerequisite: Chinese Studies 181A or equivalent.*

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.*

196. **Directed Thesis Research (4)**

Bachelor's 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)**

Thesis 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.

UPPER-DIVISION CHINESE STUDIES COURSES

For description of courses listed below, see appropriate departmental listing.

I. CONTEMPORARY CHINESE SOCIETY

Anthropology 103: Chinese Popular Religion (Jordan)

Anthropology 109: Chinese Familism (Jordan)

Anthropology 136: Culture and Personality in China (Jordan)

Anthropology 144: Traditional Chinese Society (Jordan)

History HITO 102: Asian Religions (Staff)

History HIEA 132: History of the People's Republic of China (Pickowicz)

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)

Sociology 188B: Chinese Society (Madsen)

II. LANGUAGE, THOUGHT, AND SOCIETY

Chinese Studies 111-112-113: Third-Year Chinese (Hu)

CLASSICAL STUDIES

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Chinese Studies 121-122-123: Fourth-Year Chinese (Hu)
Chinese Studies 150: Intensive Summer Language and Cultural Program in China (Staff)
Chinese Studies 163: Introduction to Chinese Linguistics (M. Chen)
Chinese Studies 181A, 181B: Introduction to Classical Chinese (Staff)
History HIEA 163: Cinema and Society in Twentieth-Century China (Pickowicz)
History HIEA 166: Self and Society in Modern Chinese Thought (Metzger)
History HIEA 169: Literature and Society in Republican China (Pickowicz)
Linguistics 141: Language Structures (M. Chen)
Literature/Chinese 101: Readings in Contemporary Chinese Literature (Yip)
Literature/Chinese 120: Readings in Classical Chinese Poetry (Tay)
Literature/General 140A: Classical Chinese Literature in Translation (Tay/Yip)
Literature/General 140B: Modern Chinese Literature in Translation (Tay/Yip)
Literature/General 140C: Contemporary Chinese Literature in Translation (Tay/Yip)
Literature/General 184: Ethnopoetics (Yip)
Literature/Th 230: Comparative Literary Theory (Yip)

■ III. MODERN CHINESE HISTORY

History HILD 4B: China and the West in Modern Times (Pickowicz)
History HILD 4BW: China and the West in Modern Times (Pickowicz)
History HIEA 125: History of Women in China (Staff)
History HIEA 130: History of the Modern Chinese Revolution: 1800-1911 (Pickowicz)
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 165: The Chinese Village in Transition: 1930-1956 (Pickowicz)

■ IV. PREMODERN CHINESE HISTORY

Chinese Studies HIEA 170: History of Science in China (J. Chen)
History HIEA 120: The History of Chinese Thought and Society: The Ancient Imperial Period (Metzger)

History HIEA 121: The History of Chinese Thought and Society: The Middle Imperial Period (Metzger)
History HIEA 122: The History of Chinese Thought and Society: The Late Imperial Period (Metzger)
History HIEA 168: Chinese Thought from Chou through Sung (Metzger)

▼ CLASSICAL STUDIES

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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*

Lecturer

Eliot Wirshbo, Ph.D., *Classical Literature and Languages*

This program offers undergraduates an opportunity to study the cultures of Greece, Rome, and the ancient Near East through the coordinated resources of the Departments of History, Literature, Visual Arts, and Philosophy. Besides training in Greek, Latin, and Hebrew, courses are included in the history, literature, art, and philosophy of Greece, Rome, and the ancient Near East, using materials in the original languages and in translation.

THE MAJOR PROGRAM

A major in classical studies consists of a choice of twelve upper-division courses approved for the program and listed below. Six of the twelve courses must involve some use of materials in the original language, Greek, Latin, or Hebrew. The particular courses making up each student's major will be selected with advice from the program staff. The major will normally include courses from three of the participating de-

partments. All majors must include the sequence Classical Studies 19A-B-C.

THE MINOR PROGRAM

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.

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.

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-C (4-4-4)

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 160. Alexander the Great and the Hellenistic World (4)

HIEU 161. The Decline of Rome (4)

HIEU 199. Independent Study in Greek and Roman History (4)

HINE 100. The Ancient Near East and Israel (4)

Judaic Studies 1-2-3. Beginning and Intermediate Hebrew (4-4-4)

Judaic Studies 101. Introduction to Hebrew Texts (4)

Judaic Studies 102. Intermediate Hebrew Texts (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 151. The Bible: The Prophetic Books (4)
Previously Lit/Gen 110.

Lit/Gen 152. Bible: The Narrative Books (4)
Previously Lit/Gen 111.

Lit/Gen 153. Bible: The Poetic Books (4)
Previously Lit/Gen 112.

Lit/Gen 156. Topics in the Prophets (4)
Previously Lit/Gen 115.

Lit/Gen 157. Topics in Biblical Narrative (4)
Previously Lit/Gen 116.

Lit/Gen 158. Topics in Biblical Poetry (4)
Previously Lit/Gen 117.

Lit/Gen 181. Mythology (4)
Previously Lit/Gen 119.

Lit/He 151. The Bible: The Prophetic Books (4)
Previously Lit/He 110.

Lit/He 152. Bible: The Narrative Books (4)
Previously Lit/He 111.

Lit/He 153. Bible: The Poetic Books (4)
Previously Lit/He 112.

Lit/He 156. Topics in the Prophets (4)
Previously Lit/He 115.

Lit/He 157. Topics in Biblical Narrative (4)
Previously Lit/He 116.

Lit/He 158. Topics in Biblical Poetry (4)
Previously Lit/He 117.

Lit/He 190. Seminars (4)

Philosophy 101. Plato (4)

Philosophy 102. Aristotle (4)

Philosophy 108. Mythology and Philosophy (4)

Philosophy 199. Independent Study (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 202. Hellenistic and Roman Philosophy (4)

Philosophy 290. Directed Independent Study (1-4)

CLINICAL PSYCHOLOGY

OFFICE: 216 Gifford Mental Health Clinic
294-8532

Professors

Gary R. Birchler, Ph.D., *Clinical/Psychiatry*

David L. Braff, M.D., *Psychiatry*

Nelson Butters, 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*

Robert M. Kaplan, Ph.D., *Community and Family
Medicine*

Daniel F. Kripke, M.D., *In Residence/Psychiatry*

Arnold J. Mandell, M.D., *Psychiatry*

Nolan E. Penn, Ph.D., *Psychiatry*

Laura Schreiber, 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, *In Residence/Psychiatry*

Lowell H. Storms, Ph.D., *In Residence/Psychiatry*

Sidney Zisook, M.D., *Psychiatry*

Associate Professors

Karen Britton, M.D., Ph.D., *In Residence/
Psychology*

Eric Courchesne, Ph.D., *In Residence/
Neurosciences*

Joel E. Dimsdale, M.D., *In Residence/Psychiatry*

James A. Kulik, Ph.D., *Psychology*

Ronald M. Ruff, Ph.D., *Clinical/Psychiatry*
Doris A. Trauner, Ph.D., *Neurology*

Assistant Professors

Sonia Ancoli-Israel, Ph.D., *Adjunct/Psychiatry*
J. Hampton Atkinson, Jr., M.D., *Adjunct/Psychiatry*
Sandra Brown, Ph.D., *In Residence/Psychiatry*
Denis F. Darko, Ph.D., *Adjunct/Psychiatry*
Dean Delis, Ph.D., *In Residence/Psychiatry*
Michael Irwin, M.D., *In Residence/Psychiatry*
Terry Jernigan, Ph.D., *In Residence/Psychiatry*
Jeffrey Matloff, Ph.D., *Clinical/Psychiatry*
Thomas L. Patterson, Ph.D., *Adjunct/Psychiatry*
Mark Slater, Ph.D., *Adjunct/Psychiatry*

THE JOINT DOCTORAL PROGRAM

The interdisciplinary partnership of the Department of Psychiatry at UCSD School of Medicine and the Department of Psychology at San Diego State University greatly extends the range of perspectives and furnishes unusual opportunities for graduate study leading to the Ph.D. degree in clinical psychology. The Joint Doctoral Group in Clinical Psychology currently consists of faculty from the UCSD Department of Psychology, and UCSD School of Medicine Departments of Psychiatry, Community and Family Medicine, Neurosciences, and SDSU Department of Psychology and School of Public Health.

Information regarding admission is found in the current edition of the *Bulletin of the Graduate Division* of San Diego State University.

The program goal is to train clinical psychologists who are accomplished both as clinicians and as research scientists. The curricula and training provide a strong foundation in clinical psychological concepts, methods, theories and data, together with intensive concentrations in specialized areas of clinical psychology. Currently our program has three areas of specialization: behavioral medicine, neuropsychology, and experimental psychopathology.

The scientist-practitioner model on which this program is based requires that students receive ongoing supervised research experience, including planning, design, implementation, analysis, and communication of findings. Equally important is extensive supervised experience aimed at developing sound general and specialized clinical skills. Students are expected to be actively involved in all these activities throughout their tenure in the program.

The program is designed as a five-year curriculum, including a one-year clinical internship. There is a minimum residency requirement of one year at each institution. The curriculum is based

on a twelve-month academic year. The program is designed to satisfy the criteria for accreditation of clinical psychology doctoral programs established by the American Psychological Association.

Specific courses currently required as part of the core at UCSD include: Clinical Psychology 224; Clinical Psychology 294; Clinical Psychology 295; Clinical Psychology 296 (independent study, lab practicum); Clinical Psychology 299 (independent study project); School of Medicine 202E (Psychopathology).

PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

Courses

Clinical Psychology 205. Neuroanatomy (6)
Fundamental anatomy/physiology of human nervous system, emphasizing higher cortical functions. Methods of clinical problem solving in neurology; background in basic neuropsychological skills.

Clinical Psychology 224. Introduction to Neuropsychology (1)
Introduction to study of brain-behavior relationships and to clinical neuropsychological assessment.

Clinical Psychology 294. Pro-Seminar in Neuropsychology (3)
Provides a fundamental knowledge of brain-behavior relationships, as well as strategies and methods of neuropsychological assessment and rehabilitation.

Clinical Psychology 295. Introduction to Research of UCSD/SDSU Faculty (4)
How to evaluate a psychological experiment; using a research evaluation guide, students will evaluate two faculty papers per week. They will also develop and present their own proposed research projects. (S/U grades only.) *Prerequisite: graduate student status in joint clinical psychology doctoral program or consent of instructor.*

School of Medicine 202E. Social and Behavioral Sciences—Psychopathology (3)
This sequence will acquaint students with techniques of interviewing, concepts of mental illness and normality, basic research in causality of behavioral disorders, and approaches to treatment, all in the context of a bio-psycho-social frame of reference. Format combines a lecture followed by smaller group sessions with a faculty leader. The groups enable students to meet patients with behavioral disorders, to practice interviewing, to develop observational skills, and to discuss material presented in lectures and assigned readings. (S/U grades only.) *Prerequisite: SOM 202A,C,D or consent of instructor.*

Clinical Psychology 296. Independent Study (1-12)
Independent survey of basic concepts in clinical psychology using various sources of material, including scientific papers in clinical psychology and behavioral science and other sources as seem indicated.

Clinical Psychology 299. Graduate Research (1-12)
Individual study course under one or more of the joint doctoral program faculty to develop certain research questions, design a methodology to answer the questions and then carry out actual research, data reduction, and analysis.

COGNITIVE SCIENCE

OFFICE: 137 Cognitive Science Building

Professors

Richard C. Atkinson, Ph.D.
Elizabeth Bates, Ph.D.
Aaron Cicourel, Ph.D.
Jeffrey L. Elman, Ph.D.
Gilles Fauconnier, Ph.D.
Marta Kutas, Ph.D.
Jean M. Mandler, Ph.D.
Helen J. Neville, Ph.D.
Donald A. Norman, Ph.D., *Chairman*
David Zipser, Ph.D.

Associate Professor

Edwin L. Hutchins, Ph.D.

Assistant Professors

David Kirsh, D.Phil.
Martin I. Sereno, Ph.D.
Jaime A. Pineda, Ph.D.
Mark St. John, Ph.D.

Adjunct Professors

David E. Rumelhart, Ph.D.
Terrence J. Sejnowski, Ph.D., *Biology and Physics*

INTRODUCTION

Cognitive science is the scientific study of the mind, the brain, and intelligent behavior, whether in humans, animals, machines, or the abstract. At UCSD, we apply a variety of methods to a wide spectrum of cognitive phenomena. The UCSD program in cognitive science has a strong commitment to the pluralistic, multidisciplinary approach to the study of cognition. Our approach emphasizes three main areas of study: the *brain*—a thorough understanding of neurological processes and phenomena; *behavior*—the experimental methods and findings from the study of psychology, language, and social and cultural issues; *computation*—the powers and limits of various representational formats coupled with studies of computational mechanisms.

These empirical and analytical methods cut across the traditional disciplines, the result being the development of a new, promising perspective upon the study of cognition. Of particular importance at UCSD is the emphasis on parallel dis-

tributed processing, or connectionist, approaches. These analytical techniques provide a powerful, unifying approach to studies as diverse as neurological mechanisms and social groups that can be applied to the study of interacting systems from neurons to societies, each of which behaves in accordance with local regularities.

The study of cognitive phenomena takes place within both the controlled situations of the laboratory and the natural situations of the everyday world. The unit under study ranges from the individual neuron, to the individual person, to the social groups in which the role of language, society, and culture play important parts, and to applied settings in the university, home, and a variety of occupations. A major theme of the UCSD Department of Cognitive Science is that each level of study can be informed through the knowledge of, and the constraints imposed from, the adjacent levels of study: the examination of all these different levels is essential for the complete study of cognition.

The underlying philosophy of the department poses special burdens on its faculty and students to be knowledgeable in and sympathetic to a large variety of fields and techniques. The challenge is great. But in the challenge is the excitement, an excitement that we intend to maintain within the teaching program of the department.

THE UNDERGRADUATE PROGRAM

GRADE REQUIREMENTS FOR THE MAJOR

For the B.A. and B.S. degree, a minimum grade-point average of 2.0 (C) is required. Major requirements are not fulfilled by courses in which a grade of D is obtained. All courses taken in fulfillment of the upper-division requirement must be taken for a letter grade, with the exception of Cognitive Science 199.

LOWER-DIVISION PREREQUISITES

Majors must complete prerequisite courses in neurobiology, calculus, statistics, and computer programming. Prerequisite courses must be taken for a letter grade.

Majors in the B.A. program satisfy the prerequisites by completing:

Neurobiology

Psychology 2 or Biology 12

Calculus

Math. 1C or Math. 2C

Statistics

Psychology 60 or Math. 183

Computer Programming

CSE 62B or CSE 65

Majors in the B.S. program satisfy the prerequisites by completing:

Biology 12

Math. 2C

Psychology 60 or Math. 183

CSE 65

UPPER-DIVISION CORE COURSES AND ELECTIVES

The B.A. degree requires completion of twelve upper-division courses; the B.S. degree requires completion of fifteen upper-division courses. All majors are required to complete three core sequences. The remainder of the requirement is fulfilled by completing electives offered by the Department of Cognitive Science or approved courses in other departments. At least half of the electives taken must be courses offered within the department.

THE UPPER-DIVISION CORE SEQUENCES

The B.A. and the B.S. programs require three core sequences:

Cognitive Science 101A-B-C (Fundamentals of Cognitive Phenomena)

Cognitive Science 107A-B-C (Cognitive Neuroscience)

Cognitive Science 108A-B (Modeling Cognitive Phenomena)

and

Cognitive Science 108C (Parallel Distributed Processing Modeling)

or Cognitive Science 108D (Artificial Intelligence Modeling)

In 1990-91, the limited faculty does not make it possible to offer 101C or 107C. Majors fulfilling core requirements should substitute elective courses. These substitutions will be accepted for the 1990-91 year only and must be approved by petition.

ELECTIVES

At least half of the electives that count toward the major must be taken in the Department of Cognitive Science. One Cognitive Science 198 or 199 course may be used to fulfill elective upper-division requirements. Courses taken as electives from outside the department must meet the following criteria:

1. The elective course deals with topics and issues that are clearly part of cognitive science;
2. The material in the course taken outside the department is not available in a course offered inside the department.

This permits students and their advisers to be responsive to changes in course offerings. Majors should obtain approval of electives from the department.

HONORS PROGRAM

In the Department of Cognitive Science, for a major to receive the B.A. or B.S. degree with honors, the student must be nominated to the honors program by a faculty member within the department. The honors program requires:

A research project (Cognitive Science 192A-B) taken in the student's senior year which results in an honors thesis;

A grade of A in Cognitive Science 192A-B;

A minimum GPA of 3.5 for courses taken in the major;

Completion of one cognitive science graduate course.

THE MINOR PROGRAMS

It is possible to pursue a minor or program of concentration in cognitive science. Each college has specific requirements. Therefore, at the beginning of their program planning, 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.

TRANSFER CREDIT

Advanced students who wish to transfer to the Department of Cognitive Science should consult with the departmental advisers about transfer credit for courses already completed.

THE GRADUATE PROGRAM

There are two options for graduate study. Within the first option, the student is a member of the Department of Cognitive Science, having been admitted to and fulfilling all requirements of the department. This approach leads to the degree of "Ph.D. in Cognitive Science." The other option is the interdisciplinary degree program in which the student enters a home department and, after one year of study in that department, adds cognitive science as an additional concentration area. This leads to a joint Ph.D. degree in the home department and cognitive science: e.g., "Ph.D. in Neuroscience and Cognitive Science."

PH.D. IN COGNITIVE SCIENCE

PROGRAM OF STUDY

The full-time graduate program provides broad training in neurological processes and phenomena, the experimental methods and findings from the study of psychology, language, and social and cultural issues, and studies of computational mechanisms. The first year is devoted to familiarizing the student with the findings and current problems in cognitive science. The second year is spent working on a research project. In the spring quarter of the second year, the department gathers to hear the oral presentations of the student's research (and the faculty read the written presentations). There are frequent faculty-student interactions, with "events" scattered throughout the year—half-day meetings on some integrated theme—as well as special lectures each quarter by the faculty or invited speakers on special themes.

This program follows these principles:

1. A year-long, six-course intensive proseminar in the first year of study in which the student is exposed to the different areas that constitute cognitive science and to the special strengths of the UCSD program;
2. An extensive research project in the second year;
3. General core knowledge, comparable as much as possible to that required of the undergraduate major;
4. Specialization in several of the subdisciplines of cognitive science through advanced courses offered both within the department and from neighboring departments.

THE FORMAL REQUIREMENTS

1. Completion of the first-year proseminar;
2. Satisfactory written and oral presentation of the second-year research project;
3. Enrollment in the Cognitive Science Seminar (Cognitive Science 200) in the second year of study (and participation thereafter encouraged);
4. Active participation in the activities of the department;
5. Completion of the study plan recommended by the student's adviser;
6. Satisfaction of the teaching and language requirements;
7. Satisfactory completion of the qualifying examination;
8. Completion of the Ph.D. dissertation and the defense of the work.

ADMISSIONS AND ADVISING

An admissions committee shall review admissions files and recommend candidates for admission. Admission shall be by the entire faculty.

At the time of admission, each student shall be assigned an interim adviser who serves as general adviser and counselor. The adviser helps chart a set of courses that provide the required content areas, taking into account the student's prior training and substantive interests. As a starting point, students are expected to know the material required of the undergraduate major in cognitive science at UCSD.

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 chairperson of the dissertation committee.

EVALUATION

A formal evaluation of all students takes place at the end of the first and second years of study, and then again at the time of qualification. The first-year evaluation is based in large part on the intensive proseminar. The second-year evaluation is based on the student's total performance, with heavy weight given to the student's research project and an oral examination.

The qualifying examination is a defense of the dissertation proposal, consisting of a written prospectus and an oral presentation presented to a doctoral committee of at least five faculty, following standard UCSD rules. It must be completed by the end of the fourth year of residence.

THE LANGUAGE REQUIREMENT

The main goal of the language requirement is to give all students experience firsthand 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 or 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. Examples of UCSD courses that satisfy the language requirement are Lit/Fr 9, Lit/Ger 10, Lit/Rus 2A-B-C, and Linguistics 34/54. The language requirement must be fulfilled prior to qualification.

THE TEACHING REQUIREMENT

The teaching assistantship provides valuable experience and also helps broaden the experience and education of the graduate students. The undergraduate program offers a special challenge to instructor and student alike, and experience

within the teaching of that program can provide a valuable part of the education of a cognitive scientist. All graduate students are required to serve as a teaching assistant for a total of three quarters of half-time teaching while in residence.

SPECIAL EVENTS

The department intends to enhance the student-faculty interaction and current awareness of active research issues by special "events":

1. Half-day sessions every quarter on some integrated theme (e.g., representations, complex systems), with readings prepared in advance by the students, and intensive faculty and student interactions, discussions, and presentations.
2. Lectures each quarter by invited speakers or faculty members on integrated themes.
3. A full day of faculty/student overview and information at the start of each year, with emphasis on ongoing research activity.
4. Presentation of second-year student research projects to the entire faculty at the end of each year.
5. Final defense of the dissertation accompanied by a public lecture and celebration by the candidate.

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

- Richard C. Atkinson, Ph.D., *Cognitive Science and Psychology*
 Elizabeth Bates, Ph.D., *Cognitive Science and Psychology*
 Patricia S. Churchland, B.Phil., *Philosophy*
 Paul M. Churchland, Ph.D., *Philosophy*
 Aaron Cicourel, Ph.D., *Sociology*
 Michael Cole, Ph.D., *Communication and Psychology*
 Roy G. D'Andrade, Ph.D., *Anthropology*
 Jeffrey L. Elman, Ph.D., *Cognitive Science and Linguistics*
 Yrjö Engeström, Ph.D., *Communication*

Gilles Fauconnier, Ph.D., *Cognitive Science*
 Philip M. Groves, Ph.D., *Psychiatry*
 Steven A. Hillyard, Ph.D., *Neurosciences*
 Patricia W. Kitcher, Ph.D., *Philosophy*
 Edward S. Klima, Ph.D., *Linguistics*
 Marta Kutas, Ph.D., *Cognitive Science and
 Neurosciences*
 Ronald W. Langacker, Ph.D., *Linguistics*
 George Mandler, Ph.D., *Psychology*
 Jean M. Mandler, Ph.D., *Cognitive Science and
 Psychology*
 Hugh B. Mehan, Ph.D., *Sociology*
 Helen J. Neville, Ph.D., *Cognitive Science,
 pending*
 Donald A. Norman, Ph.D., *Cognitive Science*
 David M. Perlmutter, Ph.D., *Linguistics*
 Walter Savitch, Ph.D., *Computer Science*
 Terrence J. Sejnowski, Ph.D., *Biology*
 Allen I. Selverston, Ph.D., *Biology*
 Larry R. Squire, Ph.D., *Psychiatry*
 Stephen P. Stich, Ph.D., *Philosophy*
 David Zipser, Ph.D., *Cognitive Science*

Associate Professors

Gerald J. Balzano, Ph.D., *Music*
 Edwin L. Hutchins, Ph.D., *Cognitive Science*
 Carol Padden, Ph.D., *Communication*
 Vilayanur S. Ramachandran, Ph.D., M.B.B.S.,
Psychology
 Stuart Zola-Morgan, Ph.D., *Psychiatry*

Assistant Professors

David Bakhurst, Ph.D., *Communication*
 Richard K. Belew, Ph.D., *Computer Science*
 Garrison W. Cottrell, Ph.D., *Computer Science*
 Suzanne Kemmer, Ph.D., *Linguistics*
 David Kirsh, D.Phil., *Cognitive Science*
 Paul Kube, Ph.D., *Computer Science*
 Harold E. Pashler, Ph.D., *Psychology*
 Jaime A. Pineda, Ph.D., *Cognitive Science*
 Mark St. John, Ph.D., *Cognitive Science*
 Joan Stiles-Davis, Ph.D., *Psychology*

Adjunct Professors

Ursula Bellugi, Ed.D., *Psychology*
 Francis H. C. Crick, Ph.D., *Biology*

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; (d) an original dissertation project of an interdisciplinary character. The degree itself reflects the interdisciplinary nature, being awarded jointly to the student for studies in the home department and cognitive science. Thus, students in linguistics or psychology will have degrees that read "Ph.D. in Linguistics and

Cognitive Science" or "Ph.D. in Psychology and Cognitive Science."

ADMISSION TO THE PROGRAM

Students enter UCSD through admission to one of the affiliated departments, which then serves as their *home department*, and which specifies their primary specialization. The affiliated departments are: psychology, computer science, neurosciences, linguistics, philosophy, sociology, and anthropology. Students may apply for admission to cognitive science during the spring quarter of the first year of residence at UCSD and must have the equivalent of master's-level requirements in their home department before joining the Cognitive Science Program. At the time of application, 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.

Students are encouraged to pursue significant research problems in cognitive science in close collaboration with individual faculty members. Direct research experience both within and outside of the home department is encouraged.

PRIMARY SPECIALIZATION

Primary specialization is accomplished through the home department. Students are expected to maintain good standing within their home departments and to complete all requirements of their home departments through qualification for candidacy for the Ph.D. degree.

SECONDARY SPECIALIZATION

The power of an interdisciplinary graduate training program lies in large measure in its ability to provide the student the tools of inquiry of more than one discipline. Students in the cognitive science interdisciplinary program are expected to gain significant expertise in areas of study outside of those covered by their home department. 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 program of study designed to give them this secondary specialization. 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 adviser and the advisory committee. Ideally, students who elect to do research in their area of secondary interest will be able to accomplish a substantive piece of work, either of publishable quality or one that will be of significant assistance in their dissertation project.

Cognitive Psychology. Get a basic introduction to cognitive psychology through the Cognitive Psychology Seminar (218A and 218B) 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 and 201B, or through the standard "testing out" option offered to all psychology graduate students). Finally, and, perhaps of most importance, the student might 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 Anthropology 214 (Quantitative Methods in Anthropology), 218 (Cognitive Anthropology), Cognitive Science 234 (Individual and Socially Distributed Cognition), 254 (Pragmatics and Common Sense Reasoning), Psychology 216 (Seminar in Comparative Cognitive Research), Sociology 204 (Text and Discourse Analysis), 240 (Ethnomethodology), 241 and 242 (Cognitive and Linguistic Aspects of Social Structure). In addition, courses on field methods are offered by both anthropology and sociology.

Computer Science and Artificial Language. This specialization requires a thorough background in computer science. For those who enter the program without much formal training in this area, the secondary specialization in computer science includes some upper-division, undergraduate courses (CSE 161A-B, 162, 165) and

a minimum of two graduate courses (CSE 278A-B). (Note that these courses require basic knowledge of programming and discrete mathematics which 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 students' advisory committees.

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. The students may take one course in syntax (Linguistics 221), one course in phonology (Linguistics 211), plus two additional courses in syntax or semantics. Alternatively, they may take two courses in phonetics/phonology (Linguistics 210, 211), one course in syntax (Linguistics 211), 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 (NS 264), Neuropsychology: Brain and Behavior (Psychology 271), and Physiological Basis of Human Information Processing (NS 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 (NS 262), Mammalian Neuroanatomy (NS 256), Development of the Nervous System (NS 260), Neuropharmacology (NS 265), Neurochemistry (NS 234), and/or Basic Medical/Neurology (SM 205). 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 their 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: 212 Contemporary Topics in the Philosophy of Science, 235

Philosophy of Language, 270 Contemporary Epistemology and Metaphysics, 272 Theory of Knowledge, 274 Philosophy of Mind, and 285 Seminar on Special Topics, 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.

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.

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 will form a dissertation advisory committee consisting of:

At least three members from the student's home department, including the student's adviser;

At least three members of the Cognitive Science Program, at least two of whom are not members of the student's home department.

The committee must be approved by the cognitive science faculty and by the dean of Graduate Studies. University regulations require that at least one of the faculty members of the committee from outside the home department be tenured. 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. This examination will nor-

mally involve a two-part oral examination. The two parts can be scheduled independently.

OVERVIEW

The program can be summarized in this way: In the first years, basic training within the major discipline of the student, provided by the individual 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. Normative time and time limits for precandidacy, financial support, and registration are those established for the home department.

Courses

LOWER DIVISION

10A-B-C. Minds, Brains, and Computers (4-4-4)

This three-quarter sequence is intended to prepare students for a major or a minor in cognitive science. The course will cover classical and fundamental questions of mind and intelligence including the relations among minds, brains, and computers. (May fulfill minor, program of concentration, and general-education requirements; see an academic adviser in your college.)

UPPER DIVISION

101A-B-C. Fundamental Cognitive Phenomena (4-4-4)

This three-quarter sequence will acquaint students with fundamental cognitive phenomena and the methods used to study them. Phenomena to be considered include sensation and perception, attention, learning, memory, reasoning, problem solving, grammar, semantics, cognitive development, and the relation of language and culture to cognition. *Prerequisites:* Math. 1C, Psychology 60 or Math. 183, or consent of instructor.

107A-B-C. Cognitive Neuroscience (4-4-4)

Basic principles of neuroscience and the range of phenomena that reflect or inform those principles. The course covers basic anatomy and physiology of the animal and human nervous system, including development and evolution. Clinical and experimental measures of cognitive performance are discussed. A major emphasis is functional neuroscience: neurological mechanisms are examined in light of current understanding of their function, of the phenomena to be explained, and of our understanding of the constraints on computational mechanisms. *Prerequisites:* Math. 1C, Psychology 60 or Math. 183, Biology 12 or Psychology 2, or consent of instructor.

108A-B. Modeling Cognitive Phenomena (4-4)

The philosophy and approach to formal modeling within cognitive science. The course involves considerable hands-on exploration of models, primarily through computer simulation. Formal topics range from traditional symbolic computation through more recent work on subsymbolic mechanisms, focusing on parallel distributed processing (connectionist) approaches and other forms of interacting local-processing structures. Special emphasis is placed on neural modeling, studies

of computational vision and linguistics, and studies of language, thought, and memory. *Prerequisites: Math. 1C, Psychology 60 or Math. 183, CSE 65, or consent of instructor.*

108C. Parallel Distributed Processing Modeling (4)
Continuation of the 108 sequence, with emphasis on the study of parallel distributed processing models of cognitive systems (also known as neural networks). *Prerequisite: Cognitive Science 108B.*

108D. Artificial Intelligence Modeling (4)
Continuation of the 108 sequence with emphasis on artificial intelligence models of control and representation. *Prerequisite: Cognitive Science 108B.*

130. Everyday Cognition (4)
This course will consider a number of attempts to study 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. (Not offered in 1990-91.)

131. Distributed Cognition (4)
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.

132. Cognitive Engineering (4)
Applications of cognitive science 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, Cognitive Engineering. Students who have already taken Psychology 135 may not receive credit for Cognitive Science 132. They may, however, take and receive credit for Cognitive Science 130 and Cognitive Science 131.) *Prerequisite: Cognitive Science 131.*

141. Observation, Protocol, and Discourse Analysis (4)
The observation of human problem solving in natural settings and the role of written and oral protocols and discourse in the way decisions are reached. Several exercises will introduce students to observational methods and the analysis of speech events and written documents.

150. Semantics (4)
Meaning, reasoning, and understanding: a study of the ways in which natural language reflects complex human thinking processes.

170. Natural and Artificial Symbolic-Representational Systems (4)
Human symbol manipulation and interpretation has been modeled after artificial symbol processing machines. This course compares the computer metaphor for cognition with one drawn from the study of biological symbol processing at the level of individual cells. *Prerequisites: cognitive science B.A. major prerequisites.*

190A-B. Projects in Cognitive Science (4-4)
This course is for advanced students who wish to undertake a two-quarter long research project. Projects may be in any of the various areas in cognitive science. *Prerequisites: cognitive science B.A. major prerequisites.*

192A-B. Senior Honors Thesis (4-4)
This two-quarter course is required of students seeking the B.A. or B.S. degree in cognitive science with honors. Students will design and execute a project in some aspect of cognitive science under the supervision of a cognitive science faculty member. The project will result in an honors thesis produced prior to the end of the second quarter. *Prerequisite: admittance to honors program in cognitive science.*

199. Special Project (4)
Independent reading or research by special arrangement with a faculty member. *Prerequisites: upper-division standing and consent of instructor.*

GRADUATE

200. Cognitive Science Seminar (4)
A seminar offered by the Cognitive Science Group faculty emphasizing the conceptual bases of cognitive science, including problems of representation, processing mechanisms, language, and the role of interaction among individuals, culture, and the environment. Current developments in each field will be considered as they relate to broad issues of general interest in cognitive science. May be repeated for credit.

201A-B-C. Intensive Proseminar on Cognitive Science (4-4-4)
Cognitive phenomena and the basic skills and tools to deal with them: computation, artificial intelligence, parallel distributed processing, formal logic and grammars, neuro-modeling, neurobiological basis of cognitive processes, cognitive semantics and pragmatics, social cognition, language, representations, development and learning. The entire faculty participates. Required of all first-year graduate students in cognitive science. Others must have permission of the department.

202A-B-C. Intensive Proseminar on Cognitive Science (4-4-4)
Adjunct to Cognitive Science 201A-B-C. The two sequences must be taken concurrently.

203A-B-C. Introduction to Research (4-4-4)
Intensive, active research on a topic selected by the student and adviser. The student does a thorough analysis of the problem and of the research literature, carries out new, original studies of problems in the area, and prepares a formal report for both oral and written presentation at the end of the spring quarter. The students should aim for a report of publishable quality. The course is required of all second-year students in the department. *Prerequisite: second-year cognitive science students only.*

211. Representation (4)
The nature of representation in cognitive systems.

212. Theories of Learning (4)
A survey of theories of learning: formal, statistical, analogical, connectionist.

220. Complexity as an Emergent Property (4)
This course will look at the way in which complex behavior may arise in relatively simple systems. Examples to be studied include evolution, neural networks, and social systems.

231. Cognition and Action (4)
Studies of cognition in the real world, where perception, knowledge, intention, and action form a closed cycle of events. Extensive analysis of "everyday cognition" and a consideration of application, especially to the theory of the design of cognitive artifacts.

234. Individual and Socially Distributed Cognition (4)
Course will focus on aspects of individual and socially distributed cognition associated with reasoning and decision making under conditions of uncertainty. Empirical examples will be drawn from natural and experimental settings which presuppose, tacitly or explicitly, socially distributed knowledge among the participants. The class will examine the way locally managed, pragmatic conditions influence how decisions are framed. *Prerequisite: graduate standing or consent of instructor.*

251. Aphasia (4)
A survey of research and theory on language breakdown in brain-damaged adults. Includes an historical overview (from Broca through Geschwind), followed by contemporary theory

and evidence from linguistics, psycholinguistics, and neuroscience (especially brain-imaging techniques).

253. Semantics and Cognition (4)
This course will explore the cognitive organization that lies behind natural language production and understanding.

254. Pragmatics and Common Sense Reasoning (4)
A study of the pragmatic principles involved in language comprehension and the logic of everyday life. Cognitive, linguistic, cultural, and sociological aspects will be covered.

261. Foundations of Cognitive Science (4)
Examination of the philosophical issues surrounding the scientific study of cognition, perception, and other mental phenomena.

271. Biological Foundations of Language (4)
This course covers a variety of issues relating to the biological bases of language, including brain substrates of language; hemispheric asymmetries; language disorders; language in other species; language evolution.

275. Visual Modeling (4)
Current approaches to modeling visual function. The course concentrates on models with a degree of neural realism, but traditional artificial intelligence approaches are also covered. Students will prepare a project.

280. Seminar on Special Topics (4)
Discussion of specific problems in cognitive science. May be repeated when topics vary.

281. Topics in Parallel Distributed Processing (4)
Advanced topics in parallel distributed processing. May be repeated when topics vary.

282. Topics in Artificial Intelligence (4)
Seminar course on fundamental issues in artificial intelligence. May be repeated when topics vary.

298. Directed Independent Study (1-12)
Supervised study and research of selected topics under the direction of a member of the faculty.

299. Thesis Research (1-12)
Directed research on dissertation topic.

500. Teaching Apprenticeship (4)
Teaching practicum for graduate students. Credit may be obtained for participation.

The courses listed below are some of those offered in the university which are of special relevance to students in the interdisciplinary program in cognitive science. Some subset of these courses offered outside the student's home department as well as other courses in the university can be used in partial fulfillment of the secondary specialization requirement. *Students should plan their secondary specialization work in conjunction with their advisory committee.*

Anthropology 214. Quantitative Methods in Anthropology (4)
This seminar will cover the basic statistical techniques used in the social sciences, as well as selected techniques of multi-dimensional analysis. Use will be made of computer-based interactive statistical programs, such as minitab.

Anthropology 218. Cognitive Anthropology (4)
This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethnoscience, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.*

CSE 264A. Software Engineering (4)

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-C, 171A, or consent of instructor.*

CSE 264B. Advanced Operating Systems (4)

Software engineering principles and techniques which are specifically related to the design and implementation of operating systems. Topics include cooperating sequential processes, resource protection, recoverability, and systems programming language. *Prerequisites: CSE 171A-B or consent of instructor.*

CSE 264C. Advanced Compiler Design (4)

Advanced material in programming languages and translator systems. Topics include compilers, code optimization, and debugging interpreters. *Prerequisites: CSE161A-B-C or consent of instructor.*

CSE 265A-B-C. Automata, Formal Languages, and Complexity Theory (4-4-4)

Finite-state machines; context-free languages, pushdown automata, parsing theory; Turing and register type machines, halting problem, time and tape complexity; Blum axioms; analysis of the computational cost of specific tasks such as sorting, matrix manipulation, and polynomial evaluation. *Prerequisite: consent of instructor.*

CSE 278A. Advanced Artificial Intelligence I (4)

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.

CSE 278B. Advanced Artificial Intelligence II (4)

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 discussed. Machine learning will also be a major topic of this course.

Linguistics 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.

Linguistics 211. Introductory Phonology (4)

Introduction to theoretical concepts, methods of analysis, phonetic transcription and descriptive apparatus.

Linguistics 212. Theories in Phonology (4)

Current theoretical approaches: one particular approach will be explored in a given quarter. May be repeated for credit when topics vary.

Linguistics 213. Issues in Phonology (4)

Current theoretical issues. May be repeated for credit when topics vary.

Linguistics 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.

Linguistics 219. Recent Approaches to Phonology (4)

Recent theoretical proposals will be examined critically and confronted with relevant data. Since the subject matter will change, this course may be repeated for credit.

Linguistics 221. Introductory Syntax (4-4)

Introduction to theoretical concepts, methods of analysis, and descriptive apparatus, concentrating on syntactic constructions, major hypotheses, and argumentation techniques.

Linguistics 222. Theories in Syntax (4)

Current theoretical approaches: one particular approach will be explored in a given quarter. May be repeated for credit when topics vary.

Linguistics 223. Issues in Syntax (4)

Current theoretical issues. May be repeated for credit when topics vary.

Linguistics 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.

Linguistics 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.

Linguistics 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.

Linguistics 260. Formal Linguistics (4)

Theory of formal grammars, with particular emphasis on context/free grammars. Aspects of theories of automata and computation related to grammatical systems. Relationship of the hierarchies of automata and grammars.

Linguistics 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.

Linguistics 265. Topics in Formal Linguistics (4)

Advanced material in special areas of the study of formal grammars to be selected by the instructor. May be repeated for credit. *Prerequisite: Linguistics 260 or consent of instructor.*

Linguistics 270. Psycholinguistics (4)

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

Linguistics 272. Language and the Brain (4)

Basic neuroanatomical and neuropsychologic aspects of normal and abnormal language. Cerebral lateralization of language. Aphasia and dyslexia. Animal communication.

Neurosciences 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.)

Neurosciences 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.)

Neurosciences 256. Mammalian Neuroanatomy (4)

Lectures and laboratory 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.)

Neurosciences 260. Development of the Nervous System (4)

This course will examine development of the vertebrate nervous system, with an emphasis on basic human neuroembryology. Topics will include neural tube and crest formation; histogenesis, differentiation, and synaptogenesis in nuclear and cortical structures; maturation of metabolic and neurotransmitter functions; and hormonal influences on neural development. *Prerequisite: graduate or medical student or consent of instructor.* (S/U grades only.)

Neurosciences 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.*

Neurosciences 265. Neuropharmacology and Receptor Mechanisms (3)

(Same as Physiol./Pharm. 230.) An examination of the molecular and biochemical bases of drug and neurotransmitter action. The fall quarter course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. *Prerequisite: course in biochemistry.* (S/U grades only.)

Philosophy 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.*

Philosophy 235. Philosophy of Language (4)

(Same as Ling. 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.

Philosophy 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.

Philosophy 272. Theory of Knowledge (4)

An examination and critique of representative theories of mind, reality, knowledge, and perception.

Philosophy 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.

Philosophy 285. Seminar on Special Topics (4)

A seminar for examination of specific philosophical problems. (S/U grades permitted.)

Psychology 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.*

Psychology 215. Language Acquisition (4)

Discussion of the acquisition of language by young children, including such topics as its stages, mechanisms, and relation to nonlinguistic development. *Prerequisite: consent of instructor.*

Psychology 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.

Psychology 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 specialty. *Prerequisite: graduate status in psychology or consent of instructor.*

Psychology 227. Cognitive Development (4)

Selected topics with emphasis on current experimental work. Advanced seminar. *Prerequisite: consent of instructor.*

Psychology 228A. Theoretical Methods in Psychology (4)

An introduction to the methodology of model building and theory development in psychology. Topics to be covered include the techniques from: stochastic modeling, computer simulations, decision theory, and scaling.

Psychology 228B-C. Theoretical Methods in Psychology (4-4)

Seminar on methods for building mathematical and computer simulation models in learning, memory, perception, and sensory processes.

Psychology 271. Neuropsychology: Principles of Brain and Behavior (4)

A survey of brain-behavior relationships drawing principally from the study of man and non-human primates. Topics to be covered include evolution of intelligence, hemispheric relations, language, memory, perception, and motivation. Emphasis will be on student presentations and discussion.

Sociology 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.

Sociology 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.

Sociology 241. Cognitive and Linguistic Aspects of Social Structure (4)

Introduction to topics in speech act theory, cognitive approaches to story grammars, and the analysis of conversational or discourse material as they apply to the study of social interaction and organizational structures.

Sociology 242. Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4)

An advanced seminar dealing with field and quasi-experimental methods of studying discourse and textual materials. Students are expected to conduct their own field research in natural or organization settings.

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.
Carol Padden, Ph.D.
Harley Shaiken, B.A.

Assistant Professors

David Bakhurst, Ph.D.
William Drake, Ph.D.
Vicente Rafael, 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.

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 communication technologies, and the political economy of mass communications 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.

RECOMMENDATIONS FOR TRANSFER STUDENTS

As a transfer student, you will be admitted to UCSD as a pre-communication major. Such a



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classification does not guarantee acceptance into the major, but is used as an indication of your interest. Acceptance into the major itself will require departmental approval based on your performance in courses that are prerequisite to the major. Some transfer courses may satisfy these requirements. Please make arrangements to see the undergraduate coordinator in communication (619/534-2379) to determine where acceptable transfer credits can apply to the major. Bring college transcripts, college catalogues, and course syllabi at the time of your appointment. Once you have been admitted as a transfer student, please bring a copy of your "Acceptable Transfer Credits" from the Office of Admissions to the undergraduate coordinator in communication.

PRE-COMMUNICATION

The communication major will be open only to those students who have completed the pre-communication requirements (as outlined below) with a grade of C- or better in all eight courses. (None of the pre-major courses may be taken on a Pass/Not Pass basis.) Students who have completed the pre-major requirements may apply directly to the Department of Communication to declare the major.

REQUIREMENTS FOR THE PRE-COMMUNICATION MAJOR

Effective Fall 1987

(Lower Division: Eight courses required)

A. Social Sciences: Two courses from the following list:

- Sociology 1A or 1B (The Study of Society)
- Anthropology 22 (Introduction to Cultural Anthropology)
- Anthropology 23 (Cultural Anthropology: Society)
- Political Science 10 (American Politics)
- Political Science 11 (Comparative Politics)
- Political Science 12 (International Relations)
- Social Science 10A-B-C (Modern Society)
- Economics 1B (Macroeconomics)

B. Analysis and interpretation in humanities and fine arts: Two courses of your choice from the following list:

- Literature/Eng. 21, 22, 23, or 24 (The English Literary Imagination)
- Literature/Gen. 4A,B,C (Fiction and Film in Twentieth-Century Societies)
- VA 11-12-14 (Western Art)
- History 1A-B-C (Latin America)
- History 2A-B-C (United States)

- History 3A-B-C (Europe)
- History 7A-B-C (Race and Ethnicity in the U.S.)
- History 24-25-26-27 (Underdevelopment, Third World)
- History 29 (Women in the U.S.)

C. The Study of Languages and Human Cognitive Capacities: Two courses must be chosen from the following list:

- Linguistics/General 5 (Introduction to Language)
- Linguistics/General 10 (Introduction to General Linguistics)
- Psychology 1 (Psychology)
- Psychology 3 (General Psychology: Cognitive Foundations)
- Philosophy 10 (Introduction to Logic)
- Philosophy 15 (Introduction to Philosophy: Theory and Knowledge)

D. Communication

- Com/Gen 20 (Introduction to Communication) Must be taken at UCSD.

E. Visual Arts

- Visual Arts 70 (Introduction to Media)

No upper-division courses may be taken, without instructor's permission, prior to completion of the pre-major requirements.

THE COMMUNICATION MAJOR

Degree offered: Bachelor of Arts

The major itself consists of fourteen upper-division courses. None of the courses may be taken on a Pass/Not Pass basis.

UPPER DIVISION (14 Courses required)

*Com/SF 100: Intro. to Communication as a Social Force

*Com/Cul 100: Intro. to Communication and Culture

*Com/HIP 100: Intro. to Communication and Human Information Processing

*Com/Gen 100: Intro. to Media Use in Communication

*Com/Gen 150: Integrative Seminar in Communication to be taken in the senior year

One media methods course (to be selected from communication courses numbered 101-120)

Three courses beyond the 100-level introductory courses: one must be chosen from *each* of the following categories—Com/SF, and Com/Cul, and Com/HIP.

Five upper-division communication electives to be selected from the communication course offerings

RESIDENCY REQUIREMENT

Com/Gen 20, Com/SF 100, Com/Cul 100, Com/HIP 100, and Com/Gen 100 *must* be taken at UCSD. Students must take at least ten classes of their overall work in the major at UCSD.

REQUIREMENTS FOR THE COMMUNICATION MINOR

(Effective Fall 1987)

The communication minor at UCSD is a social science minor. None of the courses may be taken on a Pass/Not Pass basis. Students are required to take six courses in communication as follows:

*Com/Gen 20 (Introduction to Communication)

Two courses of your choice from the following:

*Com/SF 100 (Introduction to Communication as a Social Force)

*Com/Cul 100 (Introduction to Communication and Culture)

*Com/HIP 100 (Introduction to Communication and Human Information Processing)

Three upper-division communication electives within the areas of the chosen 100 classes.

Note: Com/Gen 100, Com/Gen 150, 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 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

*These courses must be taken at UCSD.

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 theories, the evolution of media delivery systems, and content and media research findings. *Prerequisite: completion of pre-major. 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 100 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 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*

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)

The information age confronts governments with difficult policy choices regarding the proper balance between trade and regulatory objectives. This course compares and contrasts the causes and consequences of different national policy responses to the increasingly competitive global environment. Topics include theories of the state and policy making, and international tele-

a Social Force, 2. Communication and Culture, and 3. Communication and the Individual. Communication as a Social Force deals with the political economy of mass communication and the study of the media as social institutions. 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, and anthropology to focus on the social construction of interpretation and meaning. Special interests include the study of broadcast news, print journalism, commercial entertainment, and live performances as communicative systems. Communication and the Individual involves examination of the individual as socially constituted through language and other media. Special interests include the language and culture of the deaf, computer-mediated interaction, and the effects of specific media practices on individual consciousness. The program also emphasizes a production component in which students test theory in practical implementations.

Some faculty and student interests bridge the three components of the curriculum. Faculty research interests that do so include Soviet concepts of person and mind, communication and collective memory; relations of language, power and culture; gender and cultural forms; 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). Communication 201A-B-C (Methods in the Study of Social Force, Culture, and the Individual).
2. Four courses in communication history and theory (see course listings).
3. Communication 280, Advanced Workshop in Communication Media (not open to first-year students).
4. Communication 296, Communication Research as an Interdisciplinary Activity (not open to first-year students).
5. 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.
6. 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).

7. Qualifying Examinations: Before the beginning of the fourth year the student must take and pass an oral qualifying examination. The exam will be based on two papers concerning two of the subfields covered in the program.

8. 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.

9. 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 chairperson 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:
Carol Padden

Faculty Undergraduate Adviser:
Yrjö Engeström

Student Services Coordinator:
Gregory Griffin

Undergraduate 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 20W. Introduction to Communication/Writing (6)

A writing-intensive version of Comm/Gen 20 that teaches written and analytical skills in conjunction with the historical introduction to the ways in which the means of communication structure human activity. Staff

communications and information policy in the United States, other industrialized countries, and the developing and communist worlds. *Prerequisite: Com/SF 100, Com/SF 120, or consent of instructor.* Drake

Com/SF 122. Multinational Policies in Global Communications (4)

While multilateral policy regimes, or shared "rules of the game," are mandatory for global communications, governments often disagree on the international distribution of costs and benefits under such arrangements. This course examines international competition and cooperation in the negotiation of institutions for global collective management. Topics include the extant international regimes for telecommunications, satellite services, and the allocation of radio frequencies and geostationary orbital slots, as well as recent efforts to develop regimes for transborder data flows and trade in services. *Prerequisite: Com/SF 100, Com/SF 120, or consent of instructor.* Drake

Com/SF 124A-B. Public Opinion and Political Ideology (4-4)

(Same as Pol. Sci. 102DA-102DB.) The structure, origins, and dynamics of public opinion and political ideology. Com/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. Com/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 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. *Prerequisites: completion of pre-major and Com/SF 100.* Staff

Com/SF 166. The Discourse of the Cold War (4)

The relationship between power and interests is explored through the concept of discourse regimes using the historical epoch known as the Cold War as a topic of investigation. The origins of Cold War discourse, its reification, routinization, and dissolution are discussed. Comparisons to other discourse regimes are made. Staff

Com/SF 171A-B. American News Media (4-4)

(Same as Sociology 165 and Pol. Sci. 102I.) History, politics, social organization, and ideology of the American news media. SF 171A surveys the development of the news media as an institution, from earliest new newspapers to modern mass news media. SF 171B deals with special topics, including the nature of television news, and with methods of news media research, and requires a research paper. *Prerequisite: Com/SF 100 for Com/SF 171A; Com/SF 171A is required for Com/SF 171B.* Hallin

Com/SF 172. Sociology of Design (4)

This course will examine design as a social force. This course covers the relationship between design traditions, scientific theories, and technological development and social structure. The design traditions discussed most will be fashion design, city planning, architecture, and garden design. Most literature on these traditions emphasizes the cultural factors shaping historical changes in design. This course will try to see how these cultural factors have interacted with technical and socio-economic forces. *Prerequisites: completion of pre-major, Com/SF 100.* Mukerji

Com/SF 174. Popular Culture (4)

(Same as Sociol. 162.) An overview of the historical development of popular culture, with particular emphasis on the growth of the mass media. Lectures and readings cover a variety of the forms of popular culture that have emerged from the early modern period to the present, review major theories explaining how popular culture reflects and/or affects other patterns of social behavior, and discuss the role of popular culture, in general, and the mass media, in particular, in contemporary society. *Prerequisite: Com/SF 100 or consent of instructor.* Mukerji

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 patterns 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 relation-

ships 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

■ 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: completion of pre-major requirements 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: (a) participation in measurement and analysis of stereotype presentations; (b) investigating techniques for assessing both cognitive and behavioral effects of such scripted presentations on the users of media. *Prerequisites: Com/Cul 100 and Com/Gen 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. *Prerequisite: Com/Cul 100, Com/Cul 173 (may be taken concurrently) or consent of instructor.* 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 100 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 100 recommended) or consent of instructor.* Keyssar

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 100 recommended) or consent of instructor.* Keyssar

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: completion of pre-major, Com/Cul 100, Com/Gen 100. 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, 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, uses 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 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 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 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. Sociology of Visual Knowledge (4)

(Same as Sociol. 173.) This course will cover four different uses of media images as documents of natural events: documents of families (home movies, family photographs), educational documentaries, media images for scientific research, and conventional documentary films. Classes will include discussion of and lectures about characteristics of those situations in which these types of images are produced and interpreted as well as the methods people use to evaluate and interpret these kinds of visual information. *Prerequisite: Com/Cul 100 or consent of instructor.* Mukerji

Com/Cul 169. Culture, Ideology, and Collective Memory (4)

(Same as Lit/Gen 169.) 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

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messages of advertising. *Prerequisite: Com/Cul 100 or consent of instructor.* Schudson

Com/Cul 174. Persuasion and Society (4)

What is the role of messages intentionally designed to be persuasive in society? How are these 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: the school curriculum as persuasion, advertising, public information campaigns, and political persuasion. *Prerequisite: Com/Cul 100 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 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: completion of pre-major requirements 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. *Prerequisites: Com/HIP 100, Com/Gen 100, 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. *Prerequisites: 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 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: completion of pre-major, 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 100 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 100 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 observation, 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 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

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: completion of pre-communication major or consent of instructor.* 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 100, 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-López

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 mass communication industries and organizations, both historically and cross-nationally. The analytic focus will examine casual relationships between 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, Staff

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

Com 201A. Methods in the Study of Communication: Social Force (4)

This course is an introduction to social science as a form of knowledge and to two basic methodologies in the study of communication as a social force: survey analysis and policy analysis. This is a course in the logic of inquiry. The focus is not on particular techniques—sampling techniques in survey research, for instance—but on general concepts: the notion of a model, what it means to operationalize a theoretical concept; the problems of reliability and validity in measurement, etc. Hallin, Staff

Com 201B. Methods in the Study of Communication and Culture (4)

Students will be introduced in this course to several modes of textual analysis including semiotics, structuralism, deconstruction, and psychoanalytic interpretation. Their second area of focus will be training in ethnographic methods and evaluation of ethnographic studies. Davis, Keyssar

Com 201C. Methods in the Study of Communication and the Individual (4)

This class seeks to prepare students to evaluate individual psychological processes in the context of a broad "mediational" approach to language and thought. Two methodological issues are highlighted. The contrast between experimental and correlational techniques of data analysis, and the analysis of linguistic communication. Cole, Padden

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 information 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

COMPARATIVE STUDIES IN LANGUAGE, SOCIETY, AND CULTURE

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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 225. Historical Research in Media (4)

In this course we will discuss the value of historical research in developing theories of media development and media effects; we will also examine skills and resources for conducting historical research. Mukerji

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 historic 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 240. The Culture of Consumption (4)

This course will explore the development and cultural manifestations of consumerism in the nineteenth and twentieth centuries. Topics will include the rise of museums and department stores, and the development of mass market literature and journalism, advertising, and the growth of commercial amusements. Readings will focus primarily, though not exclusively, on the United States. Students will be encouraged to think historically and comparatively. Davis

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 Mediational Approaches to Culture/Mind (4)

This course will examine theories of mind in which cultural mediation is given a leading role. The work of anthropologists, psychologists, and communication scholars will be studied in depth. Emphasis will be placed on the methodological implication of cultural theories of mind for empirical research. *Prerequisite: graduate standing or consent of instructor.* 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 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.

COMPARATIVE STUDIES IN LANGUAGE, SOCIETY, AND CULTURE

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OFFICE: 220 Third College Humanities Building

Program Faculty

Georgios H. Anagnostopoulos, *Department of Philosophy*

H. Stuart Hughes, *Professor Emeritus, Department of History*

Roy Harvey Pearce, *Professor Emeritus, Department of Literature*

Roger Reynolds, *Department of Music*
Melford E. Spiro, *Professor Emeritus, Department of Anthropology*

Graduate students in the humanities, social sciences, and arts in this program, and under guidance of an interdepartmental committee, are given the opportunity to design strongly interdisciplinary curricula, on the basis of which they write their dissertations. The program requires that the student be admitted and fundamentally trained in one discipline and that he or she undertake M.A.-level studies in an integrally related discipline or culture area. The qualifying examination will cover the whole of the student's studies, although its structure will be that designed by the department in which the student is fundamentally trained.

Application to the Program in Comparative Studies may be made at the earliest during the student's third quarter of residency in his or her primary department. From the point of acceptance into the program, the student's work will be under the supervision of an interdisciplinary committee, which will conduct the examination for Ph.D. candidacy, approve all study and research plans including the dissertation proposal, and forward them to the Graduate Council for final approval. The degree granted will indicate in its title the precise nature of the student's studies and research—e.g., Ph.D. in Comparative Literature and Ethnopoetics, in Linguistics and Literary

Studies, in Economics and Chinese Studies, in Philosophy and the History of Ideas. Students applying for admission to UCSD and interested in applying for admission to the program should direct their inquiries to a primary department. Students already admitted to a primary department should, after the required quarters of residence and with the advice of a departmental adviser, direct inquiries to the chairperson of the program.

PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed eight years.

COMPUTER SCIENCE AND ENGINEERING (CSE)

See Engineering, Division of

CONTEMPORARY BLACK ARTS PROGRAM

OFFICE: 240 Third College Humanities Building

Director
Floyd Gaffney, Ph.D.

Faculty

Ken Anderson, *Visiting Lecturer in Music*
James Cheatham, *Senior Lecturer with Security of Employment in Music*
John H. Douglass, Ph.D., *Supervisor in Physical Education*
Edith Fisher, M.L.S., *Adjunct Lecturer*
Frances Foster, Ph.D., *Professor of Literature*
Floyd Gaffney, Ph.D., *Professor of Drama*
Luther James, *Associate Professor of Drama*
Helene Keyssar, Ph.D., *Professor, Communication*
Sandra Foster-King, M.F.A., *Visiting Dance Lecturer in Drama*
Cecil Lytle, B.A., *Professor of Music*
Faith Ringgold, M.A., *Professor of Visual Arts*
Julie Saville, M.A., *Acting Assistant Professor of History*
Charles W. Thomas, II, Ph.D., *Professor of Urban Studies and Planning*
Sherley Anne Williams, M.A., *Professor of 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 16. Introduction to Black Drama (4) (S)

Literature/English 17. Introduction to Afro-American Literature (4) (F)

Music 127A. Music of Black Americans (4) (W)

2. A fourth lecture course selected from the following approved list:

Theatre 141. Modern Black Drama (4) (W)

Literature/English 183. Black Prose: Shaping the Racial Image (4) (W)

Literature/English 184. Afro-American Poetry (4) (F)

Literature/English 185. Literature of Slavery (4) (S)

Literature/Writing 100. Beginning Fiction (4) (F)

Music 126. Introduction to Oral Music (4) (F)

Music 127B. Music of Black Americans (4) (S)

History 159A-B. Afro-American History (4) (W,S)

History 164Q. American Slavery in Comparative Perspectives (4) (S)

VA 1. Introduction to Art (4) (W,S)

USP 150. The Black Ghetto (4) (W)

P.E. 121. The Black Athlete (4) (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) (W,S)

Theatre 187A. Black Theatre Ensemble (4) (F)

Students interested in either taking Contemporary Black Arts Program courses or completing the minor are encouraged to discuss their interests and develop a course of study with a faculty member of the program at their earliest convenience.

CONTEMPORARY ISSUES

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

Director
Patrick J. Ledden, Ph.D.

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)

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. Anthropology of Medicine (4)

(Same as Anthro. 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

140. Healing Arts in Cultural Perspective (4)

(Same as Anthro. 178.) We review medical systems in a broader, cultural base and their transformation in acculturation, e.g., empirical analysis of non-Western medical practices, social structure and ritual in biomedicine, symbols and healing, psychiatry and its problematics in transcultural application. *Prerequisite: upper-division standing.* L. Ross

195. Discussion Leading in Contemporary Issues (4)

Students will lead groups of ten to twenty students in discussions of contemporary concern. Students will meet with the professor to plan and prepare for their discussions to be held weekly. Students will also consult with another faculty member specializing in their topics for further check on reading materials and course of discussion. (P/NP grades only.) *Prerequisite:*

EARTH SCIENCES

site: *Contemporary Issues 96 or 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.)

Community Medicine 236. Medical Anthropology (3)

An analysis and synthesis of the growing body of anthropological concepts and investigations concerned with illness and curing events from primitive cultures to complex urban societies, and their relevance to medical practice. L. Ross (W)

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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 new sequence for 1988-89 introduced students to central concepts and issues in women's studies.

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 life-style 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)

2A. Introduction to Women's Studies: Gender in History and Culture (4)

This course will focus on manifestations of gender difference in the history and literature of one or more cultures, studying the social construction of gender both in the symbolic representations and institutionalized practices of a given society and period.

2B. Introduction to Women's Studies: Gender and Identity (4)

This course will emphasize gender and the individual, with consideration of psychological, sociological, biological, and anthropological notions of gendered identity.

2C. Introduction to Women's Studies: Women and Contemporary Issues (4)

This course will treat specific issues of social policy that affect women in particular. Topics may include abortion, reproductive rights, new reproductive technologies, and the feminization of poverty.

102. Selected Topics in Women's Studies (4)

This course is designed to bring the interdisciplinary focus of women's studies and the perspectives developed by feminist criticism and theory to bear on a range of issues concerning gender. Topics will vary, but they might include such subjects as gender and science, psychoanalysis and feminism, the body, interdisciplinary feminist theory, feminism and race, and reproductive technologies. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

134. The Cultures of Mexico (4)

(Same as Anthro. 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

EARTH SCIENCES

OFFICE: 1512 Galbraith Hall, Revelle College

Developments in the discipline of the earth sciences suggest that the most effective means for UCSD undergraduates to enter this fascinating field is by enriching course work for majors in the Departments of Chemistry and Physics with contemporary courses in the earth sciences. These enrichment courses are taught by faculty members of the Scripps Institution of Oceanography.

The program is based on the premise that a thorough grounding in physics or chemistry is necessary. Thus an entering student will for the first two years take the Revelle core curriculum, or its equivalent, and then elect to enter the De-

partment of Chemistry or Physics. At the beginning of the junior year, a student will select courses in consultation with the earth sciences advisers in both the Geological Sciences Group in the Scripps Institution of Oceanography and his or her own major department. Most students will be able to substitute earth sciences courses for major requirements or restricted electives.

The degree will be granted by the major department and will indicate that the student's education has been enriched in the earth sciences (e.g., B.A. in chemistry with specialization in earth sciences).

A student who plans to graduate with a specialization in earth sciences must complete ES 101, 102, 103, 120, and SIO 256A and two additional upper-division courses, approved by the SIO geology adviser, as a minimum course requirement. Additional courses for the earth sciences specialization will be selected with the aid of the earth sciences advisers. Because of course scheduling and prerequisites the normal sequence of courses begins with the series ES 101, 102, 103, 120.

This interdisciplinary program will provide the student the information to make the choice of a graduate major with the freedom that an undergraduate major in a basic science provides. This program will not impede progress in such a basic science and will provide a concrete example of such sciences applied to earth problems.

Courses

LOWER DIVISION

Lower-division courses not intended as substitutes for ES 101.

1. The Oceans (4)

Presents modern ideas and descriptions in 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 wish to become professional scientists. (Previously interdisciplinary 1.) Three hours' lecture, one hour discussion. *Prerequisite: some background in high school chemistry recommended.* W. Berger and SIO Staff (F)

2. History of the Earth and Evolution (4)

This course will offer 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 three 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 hours' lecture. *Prerequisite: none.* SIO Staff (F)

4. The Nature of the Earth (4)

Descriptive introduction to earth science. Emergence of our present knowledge of the earth's interior, mantle, crust, oceans, and atmosphere, through the study of gravity, seismology, magnetism, radioactive dating, heat flow, dynamics, and chemistry. Relations to environment and to space exploration. Three hours' lecture. These courses (The Oceans) and (The Nature of the Earth), with Physics 5 (The Skies), form a three-course sequence for general interest in science. (W)

7. Earth Resources and Environmental Issues (4)

A survey of earth and environmental sciences as they deal with resources, hazards, and man's impact on the global environment. Topics include resources (metals, fossil fuel), earthquake prediction, volcanism, landslides, ground water, pollution of lakes and estuaries, global aspects of habitat modification and extinction, atmospheric pollution, and climate modification. *Prerequisites: any basic earth science course. Freshman physics and chemistry.* W. Berger and SIO Staff (S)

UPPER DIVISION

Prerequisites for all upper-division earth science courses: one year of the Revelle natural science sequence or equivalent and one year of mathematics.

101. Introductory Geology (4)

The origin and evolution of the earth. Emphasis is on the nature of rocks and minerals, their origin, reconstitution and decay; the evolution of continents, ocean basins, and mountain belts, processes of volcanism; and the work of wind, water, and glaciers in modifying the earth's surface, the evolution of life as indicated by the fossil record. The aim is to create an awareness in the student of the geological environment in which we live. Three lectures, two laboratory periods, occasional field trips. SIO Staff (F)

102. Introductory Geochemistry (4)

The chemistry of the earth and the solar system, and the applications of physical chemistry and nuclear physics to the study of the origin and geological history of the earth. Cosmic and terrestrial abundances of elements; nucleosynthesis; origin of the earth; mineralogy and chemistry of the earth's crust, mantle, and core; geochronology and the geological timescale; chemistry of the atmosphere and the oceans. Three lectures, one discussion period. *Prerequisite: ES 101.* J. Bada and J.D. Macdougall (S)

103. Introductory Geophysics (4)

A survey course covering the use of physical measurements to determine the structure and composition of solid earth. Discussions will include an introduction to earthquake seismology, isostasy, the gravity and magnetic fields of the earth, and use of gravity, magnetism, and seismic methods for exploration. Knowledge of the earth's interior as determined from geophysical methods. *Prerequisite: ES 101.* (W)

120. Mineralogy (4)

Lectures and laboratory work on symmetry, morphology, goniometry, crystal structure, elementary x-ray crystallography, physical and chemical properties of minerals and recognition of common rock-forming minerals. Use of the petrographic microscope in the study of rock-forming minerals. Two three-hour periods of laboratory and lecture. *Prerequisites: ES 101 and 102.* M. Kastner (F)

198. Directed Group Study (2-4)

This course will cover a variety of directed group studies in areas not covered by formal departmental courses. (P/NP grades only.) *Prerequisite: consent of instructor.*

199. Independent Study for Undergraduates (4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only.) (F,W,S)

NOTE: Also see "Courses, Curricula, and Programs of Instruction: Scripps Institution of Oceanography."


ECONOMICS

OFFICE: 114 Economics Building

Professors

Richard Attiyeh, Ph.D.
Donald V.T. Bear, Ph.D.
John Conlisk, Ph.D.
Vincent Crawford, Ph.D.
Robert F. Engle, Ph.D.
Clive W.J. Granger, Ph.D.
Theodore Groves, 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., *Chairman*
Halbert White, Ph.D.

Associate Professors

Jose Luis Guasch, Ph.D.
Dennis Smallwood, Ph.D.

Assistant Professors

Richard Carson, Ph.D.
Graciela Kaminsky, Ph.D.
Emily Lawrance, Ph.D.
Andrew T. Levin, Ph.D.
Alfredo Pereira, Ph.D.
Robyn Phillips, Ph.D.
Garey Ramey, Ph.D.
Valerie Ramey, Ph.D.
James Rauch, Ph.D.
Lakshmi Raut, Ph.D.
Maxwell Stinchcombe, Ph.D.
Glenn Sueyoshi, Ph.D.

Adjunct Professors

Joseph Grunwald, Ph.D.
Lawrence Krause, Ph.D.
R. John McMillan, Ph.D.

Economics is the study of how individuals, organizations, and societies deal with scarcity—the problem that available resources are not sufficient to satisfy everyone's wants. Because scarcity requires choice among alternative uses of resources, economics involves both study of the technology by which resources are turned into the things people want and study of the preferences through which people choose among alternatives. Further, since society is composed of many individuals and groups, economics in-

volves study of the institutions through which a society can gain the advantages of cooperation and resolve the conflicts due to competing goals.

THE UNDERGRADUATE PROGRAM**LOWER-DIVISION COURSES**

The department offers two introductory sequences, Economics 1A-1B-1C and Economics 2A-2B-2C. For each sequence, the A-course is an introductory microeconomics course; the B-course is an introductory macroeconomics course; and the C-course is an applications course which uses the analytical tools introduced in the A and B courses. The 1A-1B-1C courses differ from the 2A-2B-2C courses only in the fact that the latter use calculus in the presentation. Mathematics 1A-1B-1C or better is the prerequisite for enrollment in Economics 2A, 2B, or 2C.

A micro-macro combination (such as 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, Economics 173, for which the single prerequisite is Economics 4.) Though a micro-macro combination is an acceptable introductory package for upper-division work, students typically will benefit from completion of a three-quarter introductory package (such as 1A-1B-1C). The applications course (1C in the 1A-1B-1C package) gives a broad overview of what is done in economics and thus provides a useful perspective from which to begin upper-division work.

An economics student who completes upper-division work with only a micro-macro combination (such as 1A-1B) is not allowed to pick up the lower-division applications course later; credit will not be given. (However, the applications course may be taken simultaneously with the first upper-division economics course.)

Modern economics is mathematical, and calculus is a standard working tool. Therefore, there are educational advantages in taking the calculus track of the lower-division courses (2A-2B-2C rather than 1A-1B-1C). Students planning an economics major or a quantitative economics and decision sciences major, especially the latter, are advised to take the calculus track. However, students without calculus or students who have trouble scheduling the calculus track may be reassured by the fact that the economic substance of a micro, macro, or applications course is the same in the calculus as in the non-calculus track.

For this reason, it is acceptable to mix courses from the calculus and non-calculus tracks. For examples, 1A-1B-2C and 2A-1B-2C are acceptable combinations. For the same reason, a student should not take and will not receive credit for both 1A and 2A, or both 1B and 2B, or both 1C and 2C.

The micro and macro courses may be taken in either order, or simultaneously; but both a micro and a macro course must be completed before an applications course. Thus, the three acceptable time sequences are A-B-C, B-A-C, and AB simultaneously followed by C.

The department also offers an introductory accounting course, Economics 4. It has no prerequisite, and it is a prerequisite only for the upper-division accounting course, Economics 173.

INFORMATION ON MAJORS AND MINORS

The department circulates two undergraduate informational brochures: *Entry to the Economics Majors* and *Economics Curriculum*. They are available in Room 114 of the Economics Building. The brochures answer questions frequently asked by students, give practical tips for avoiding problems, and in general provide a more detailed discussion of department programs than is possible in this catalog. It is extremely important for students majoring in the department to be familiar with the material in the *Economics Curriculum* brochure, and for students contemplating a department major to be familiar with both brochures. Department advisers operate on the presumption that students have taken the initiative to obtain brochures and to read them thoroughly.

ENTRY TO THE MAJORS

Due to extreme crowding, the department, beginning in fall 1988, instituted restrictions on entry to both of its majors. The restrictions apply to all students except those exempt under one of the following two rules. (i) A student who first enrolled at UCSD prior to fall 1988 is exempt. (ii) A student who was enrolled at another college or university prior to fall 1988 is exempt, provided that the prior enrollment was not solely during high school and the first summer following high school, and provided that there was no more than a three-year gap between enrollment at the other institution and enrollment at UCSD. Rule (ii) relaxes and supersedes the stricter rule given in the economics section of the 1988-89 *General Catalog*.

A student's admissibility to a major will be judged on the basis of the student's performance in required lower-division economics and mathematics courses (see the requirements below). The

admissibility criteria are substantially more strict than simply "C- or better." The criteria give economics courses somewhat greater importance than mathematics courses; and the criteria judge a given grade in a mathematics course more favorably if the course is taken at the Math. 2 level than if the course is taken at the Math. 1 level. In view of the fact that grading standards at other colleges and universities may be different than at UCSD, students who took some or all of the required economics and mathematics courses at other institutions are treated somewhat differently.

The exact criteria are described in full detail in the brochure *Entry to the Economics Majors*, as are entry application procedures. Copies of the brochure are available in Room 114 of the Economics Building. It is extremely important for students contemplating a major in the department to read this brochure early on; then there is still time to make the needed effort to get good grades.

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. There are restrictions on entry to the economics major; see the discussion above.

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. In addition, an applications course, either Economics 1C or 2C, is recommended.
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.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 1A or 2A	Math. 1B or 2B	Math. 1C or 2C
SOPHOMORE YEAR		
Econ. 1A, 1B, or 2A	Econ. 1B, 1A, or 2B	Econ. 1C or 2C Soc. Sci. 60
JUNIOR YEAR		
Econ. 100A Econ. 110A or 120A	Econ. 100B Econ. 110B or 120B	Elective Elective
SENIOR YEAR		
Econ. 110A or 120A Elective	Econ. 110B or 120B Elective	Elective Elective

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 the mathematical and statistical tools through which microeconomic decisions can be made. There are restrictions on entry to the QEDS major; see the discussion above.

A student majoring in QEDS must meet the following requirements.

1. Calculus and linear algebra. Mathematics 2A-2B-2C and Mathematics 2E (or 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.

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A	Math. 2B	Math. 2C
SOPHOMORE YEAR		
Econ. 2A Math. 2E	Econ. 2B	Soc. Sci. 60
JUNIOR YEAR		
Econ. 170A Econ. 120A Econ. 172A	Econ. 170B Econ. 120B Econ. 172B	Elective Econ. 171 Econ. 172C
SENIOR YEAR		
Elective Elective	Elective Elective	Elective Elective

A fuller description of the QEDS major is contained in the brochure *Economics Curriculum*, available at Room 114 of the Economics Building.

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.

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, with two exceptions. First,

courses for which P/NP grading is mandatory (such as Economics 195 and 199) may, of course, be taken P/NP. However, no more than twelve units taken P/NP may be counted toward a major. Second, in view of a change in rules, some students are allowed to count lower-division courses taken P/NP toward a major. These are students who first enrolled at UCSD prior to fall 1985, or who were enrolled at another college or university prior to fall 1985 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).

Regarding acceptable grades in the majors, there is an old rule and there is a new rule. Some students may choose to be covered under either the old rule or the new rule. These are students who first enrolled at UCSD prior to fall 1985, or who were enrolled at another college or university prior to fall 1985 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). All other students must adhere to the new rule.

Old rule. A 2.0 or better grade-point average in upper-division economics courses is required for graduation. So long as this GPA requirement is met, courses with a D grade will be accepted. The GPA is to include elective courses taken in excess of the minimum number required.

New rule. All letter-graded courses offered in fulfillment of major requirements must be passed with a grade of C- (C minus) or better. This rule applies to lower- as well as upper-division courses, and it applies to courses taken from other departments. It does not apply to courses taken in excess of those needed to satisfy requirements (for example, an *extra* elective with a D grade would not conflict with the rule).

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 prepare an acceptable dissertation. A detailed description of the Ph.D. program is available by writing the director of graduate studies, care of the Department of Economics. Residence and other campus-wide regulations are described in the graduate studies section of this catalog.

DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of five years. Total university support cannot exceed six years. Total registered time at UCSD cannot exceed seven years.

Courses

LOWER DIVISION

1A-B-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.

4. Financial Accounting (4)

Recording, organizing, and communicating economic information relating to business entities.

90. Undergraduate Seminar (1)

Selected topics in economics. (P/NP grades only.)

UPPER DIVISION

100A-B. Microeconomics (4-4)

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)

Honors sequence covering the material of Economics 100A-B. *Prerequisite:* departmental approval.

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.

ECONOMICS

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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)

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)

Honors sequence covering the material of Economics 110A-B. *Prerequisite: departmental approval.*

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 and consent of instructor.*

120A-B-C. Econometrics (4-4-4)

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, and Math. 1A-B-C.*

120AH-BH. Honors Econometrics (4-4)

Honors sequence covering the material of Economics 120A-B. *Prerequisite: departmental approval.*

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 prob-

lems. *Prerequisites: one introductory microeconomics course and one introductory macroeconomics course.*

132. Energy Economics (4)

Role of energy in the residential, commercial, industrial, and transportation sectors of the domestic 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.*

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.*

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)

The theory of business cycles and the techniques used by governments to stabilize an economy. Discussion of recent and current 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. There is no presumption that students have had previous training in either economics or statistics; although elements of both disciplines will be used in class and in some of the readings. 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. There is no presumption that students have had previous training in either economics or statistics, although elements of both disciplines will be used in class and in some of the readings. *Prerequisite: upper-division standing. Econ. 158A is not a prerequisite for Econ. 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.*

170A-B. QEDS Microeconomics (4-4)

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)

Honors sequence covering the material of Economics 170A-B. *Prerequisite: departmental approval.*

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 manage-

GRADUATE

ment 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.

190A-B-C. Honors Seminar for Economics (2-2-4)

Senior essay seminar for honors students in economics major. In-progress grading in fall and winter. *Prerequisite:* departmental approval.

191. Senior Essay Seminar (4)

Senior essay seminar for students with superior records in department majors. *Prerequisite:* department stamp required.

192A-B-C. Honors Seminar for QEDS (2-2-4)

Senior essay seminar for honors students in QEDS major. In-progress grading in fall and winter. *Prerequisite:* departmental approval.

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.

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. *Prerequisites:* Econ. 200E and 210D or consent of instructor.

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. (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. Advanced Macroeconomics (4-4)

Selected theoretical and empirical issues in macroeconomics. *Prerequisite:* Econ. 210D or consent of instructor.

212A-B-C. Workshops in Applied Regional and Macroeconomics (0-4/0-4/0-4)

An examination of recent research in empirical macroeconomic and regional economic models, utilizing both structural economic and time-series methods; development of related research topics by both graduate students and faculty. (S/U grades only.) *Prerequisite:* Econ. 210D.

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.

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. Industrial Organization (4-4)

Noncompetitive market structures and their effects on firm behavior and resource allocation. Measurement of monopoly power and its change over time. Antitrust policy. *Prerequisite:* Econ. 220F or consent of instructor.

235A-B-C. Workshop in Applied Microeconomics and Industrial Organization (0-4/0-4/0-4)

An examination of recent research in applied microeconomics with emphasis on market structure, industrial organization and regulation; development of related research topics by both graduate students and faculty. (S/U grades only.)

236. Human Resource Economics (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, both to act as critics and to report on their research. May be repeated for credit. (S/U grades only.)

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.

290A-B-C. Colloquium in Economics (0-0-0)

Lectures presented by visiting speakers and resident faculty on research in a variety of topics in both theoretical and applied economics. (S/U grades only.)

291. Advanced Field Advising (4)

Controlled reading and discussion with adviser; literature survey. May be repeated for credit.

EDUCATION ABROAD PROGRAM

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

OFFICE: Opportunities Abroad Office in the International Center (corner of Hutchison Way and Gilman Drive)

Ann Craig, Political Science, and Ramon Piñon, Biology, *Faculty Coordinators*

Mary Dhooge, *Dean of International Education*

Molly Ann McCarren and Catherine Gamon, *Advisers, Education Abroad*

Administered by the University of California, the Education Abroad Program (EAP) is now entering its twenty-seventh year of operation. Study Centers have been established in Australia, Austria, Brazil, Canada, China, Costa Rica, Denmark, Egypt, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Israel, Italy, Japan, Kenya, Korea, Mexico, New Zealand, Norway, Peru, Portugal, Spain, Sweden, Taiwan, Thailand, Togo, the United Kingdom, Ireland, and the USSR. Most programs are for a single academic year, except for Hungary, the USSR, Mexico, Togo, China, Costa Rica, Indonesia, Thailand, Korea and Japan, which also offer shorter term/special focus programs. 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 gen-

eral 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, 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 academic program of each student includes: (1) a preparatory course in the language of the country (where university instruction is not in English); (2) a full academic year of credit courses (with a few exceptions); and (3) a wide-ranging opportunity to audit courses, either in the student's special field of interest or in new fields.

In order to assist students to adjust to different academic requirements of the host university and to provide a link to American university practices, many courses taken by UC students are supplemented by tutorials. The tutorials are conducted by graduate students or junior staff of the host university, who help UC students to resolve language difficulties, provide cultural background presupposed by the lectures, give opportunities for questioning and discussion, and supplement the lectures by reading assignments, papers, and evaluation of progress.

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.

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 spe-

cial areas of excellence and strength. The listing of centers below incorporates selected information concerning these points. More detailed information is available in the flyers describing each of the centers and from the Education Abroad Program counselor 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 Strobl and Vienna precedes the beginning of the academic year. All courses are taught in German.

University of Vienna. Performing arts, economics and political economy, and East/West and central European studies.

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. Of particular interest are courses in the humanities and social sciences, especially in medieval studies, communications, and international politics and economics.

France. A compulsory intensive language course precedes the beginning of the academic year. All courses in the universities are taught in French. Customarily, tutorials accompany certain courses in which several UC students are enrolled. UC faculty directors are in residence at Bordeaux, Grenoble, and Paris.

University of Bordeaux. Broad areas of physics and mathematics. The Institute of Political Science and the Institute of Prehistory (Anthropology) are well known.

University of Grenoble. Mainly in the social sciences through the Université des Sciences Sociales (Grenoble II), some humanities, mathematics, and computer science. Offerings in anthropology, psychology, and history are severely limited. Not suitable for life and physical sciences.

University of Lyon. Humanities and social sciences. There is also an Institute of Political Science.

Paris. Students enroll at the Paris Center for Critical Studies where there is an emphasis on literature, film, theater arts (theoretical), art, philosophy, and historiography.

Pau-Paris. The participants spend the first semester at the University of Pau and move to the Paris Center at the end of January, where core courses have been organized for them. This program explores the development of French civilization, with the regional point of view offered at Pau and the national perspective presented at Paris.

University of Pau. The first semester consists of courses offered through the Pau/Paris program. Students pursue their own interests in the regular course offerings the second term. A scholarship accompanies this program, with preference given to students of Basque or Bernais background.

University of Poitiers. Humanities, with major emphasis in history and medieval studies, mathematics, physics.

Germany. A compulsory intensive language program precedes the beginning of the academic year. All courses are taught in German. Tutorials supplement courses in which several UC students are enrolled.

Georg-August University, Göttingen. Broad curriculum covering most majors. Excellent science programs, with substantial strength in biology, chemistry, physics, and mathematics. Space in laboratory courses in biology and psychology may be limited. Science majors may be restricted to theory courses.

Hungary. A fall quarter and a year-long program at Karl Marx University in Budapest. Instruction is in English and includes courses in Central European history, culture, economics, and economic history. One course is in conversational Hungarian.

Italy. A compulsory intensive program in language and contemporary Italian history at the University of Padua 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 language program in Padua. They must get the second year of Italian 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.

The Bisonte International School of Graphic Arts is a newer institution, founded in 1983 in Florence. In a theoretical, practical manner, the school provides an experimental study of both past historical periods and contemporary graphic expression.

University of Padua. The academic program consists mainly of regular university courses.

Most students study in the humanities and social sciences. For courses in art, history, and literature, the Study Center offers supplemental support courses.

University of Venice. Humanities and social science. Faculties of business, economics, literature, and industrial chemistry are renowned.

Conservatorio di Musica C.B. Martini, Bologna. Individual instruction in music performance, composition, music history. An audition is required for admission.

University of Bologna, acclaimed as the oldest university in Europe (1088), acquired its present status as a state institution in 1802. Special strengths for UC students are in the humanities and social sciences.

Accademia delle Belle Arti di Venezia, Venice. Art studio and some history. Color slides of portfolio of artistic work must be submitted for admission.

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. Humanities, social sciences, natural sciences, and mathematics are available, but space in the sciences may be limited. The usual pattern is study of a single subject, usually the major or a closely allied field, for the entire year.

Norwegian School of Economics and Business Administration. Graduate and undergraduate courses may be taken in English through the International Business Program.

Portugal. The academic program begins with a six-week intensive Portuguese language program at the Portuguese Language Institute at UCSB. At the University of Lisbon, UC students may take language and liberal arts classes designed for foreigners, as well as offerings within the regular university system. Language prerequisite: two years of university-level Portuguese, or two years of Spanish, or one year of Portuguese with one year of Spanish.

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 regular university as well as courses in the humanities specially arranged for the program. These include Catalan studies, Spanish syntax, phonetics, composition, anthropology, literature, history, art history, and music. (This is a cooperative program with the University of Illinois.)

University of Madrid. Humanities and some social sciences. The core program, developed for the UC Study Center and other American programs, concentrates on Spanish studies in the broadest sense. Core and Study Center courses are taught by Spanish faculty. In addition, students must take at least one regular university course.

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 for all students until the student has gained the equivalent of two years of Swedish. Most courses are taught in Swedish, but a few courses offered in English may be available.

University of Lund. Broad curriculum. Excellent science programs.

United Kingdom and Ireland. The program, which includes fourteen institutions, is administered by a director and associate director located in London. The UK program is highly competitive, largely due to its popularity with students. After a student has been selected for participation by the EAP administration, 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. *University of Birmingham, University of East Anglia, 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 Galway.*

Scotland. *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. Life sciences and physical sciences are available.

USSR. *Leningrad State University.* EAP offers a direct exchange with Leningrad State University for students with only two years of Russian. This is a language program available in fall and spring quarters.

For students with three years of Russian there is a cooperative program which involves a number of other American universities with arrangements coordinated through the Council on Inter-

EDUCATION ABROAD PROGRAM

national Educational Exchange (CIEE). Selection is highly competitive and is conducted on a national basis through written examination, interviews in Russian, and prepared statements of purpose. Three years of Russian at the university level are a firm requirement. Enrollment is for four months in either a spring or fall semester, or for an academic year. The curriculum is limited to Russian language and civilization for semester programs.

MIDDLE EAST

Egypt. All courses are taught in English, except courses in Arabic language and literature.

The American University, Cairo. A broad curriculum is offered by the faculty of arts and sciences. All students are required to take at least one course in Arabic during the year.

Israel. First priority is given to students who have completed at least one year of Hebrew. A compulsory language course precedes the beginning of the academic year. Study centers in Israel are administered by a UC faculty director located in Jerusalem.

Hebrew University, Jerusalem. Most UC students enroll in courses taught in English at the University's Rothberg School for Overseas Students. Offerings include Hebrew, Israeli, Middle East, and Islamic studies; Arabic, archeology. Students with adequate command of Hebrew have access to a broader curriculum throughout the Hebrew University.

ASIA

India. *Delhi, University of Delhi.* Students do special Hindi language study, enroll in some regular university classes, and take courses designed for foreigners which examine contemporary India and its traditions. The university's strengths are in history, economics, the arts, and the social sciences. Instruction is in English.

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. Undergraduates and graduate students from all disciplines are encouraged to apply.

Beijing University of Science and Technology. Students teach English to Chinese students 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.

Nanjing University in Nanjing. This program is coordinated through the Council on International

Educational Exchange (CIEE). Students may apply for either a fall or spring semester program. It is a language and area studies program. Minimum of one year of Chinese language required.

Nankai University in Tianjin. Nankai University is a comprehensive institution with multidisciplinary programs in economics, fine arts, law, management, natural sciences, social sciences, and technological sciences.

Taiwan. *National Chengchi University.* In addition to language classes, students take courses in one of three tracks: Chinese Art and Art History, Chinese Language and Culture, or International Business. The program is a cooperative arrangement with the California State University System.

Chinese University of Hong Kong. After a summer intensive language program in Cantonese, students take courses on China and Asia in English or Standard Chinese, or take courses in their area of academic interest.

Japan. Completion of one year of Japanese at the university level or the equivalent is required for acceptance in full-year programs. (A compulsory intensive language course precedes the academic year.) Students are expected to complete an additional eighteen units of Japanese language during their year in Japan. A limited number of courses taught in English is available. Their number changes from year to year since such courses depend on foreign visiting faculty who can teach in English.

International Christian University, Mitaka (Tokyo). Humanities and social sciences, with emphasis on Japanese language, literature and art, as well as a focus on problems of the Orient, economics and history of the Far East, oriental philosophy, and political science.

Sophia University (Tokyo). Program consists of language courses and courses in English and Japanese at the Ichigaya Campus. Sophia offers a wide variety of English language courses in the humanities, social sciences, and international business.

Tokyo Institute of Technology. Graduate students may do research and take courses in the fields of science and engineering at TIT. The academic program will be determined according to Japanese language proficiency.

Meiji Gakuin University, Yokohama. A spring quarter Peace Studies Program includes peace studies courses and seminars, taught in English. Japanese language course is optional.

Doshisha University, Kyoto. Requires a minimum of two years of Japanese language. Courses are taught in Japanese.

Korea. Students study for either a year or semester at Yonsei University in Seoul. The aca-

demical program includes language study and courses taught in English in the humanities and social sciences. EAP students proficient in Korean may enroll in regular university courses.

Indonesia. An eight-week summer language program at Gadjah Mada University in Yogyakarta will consist of Indonesian language study and an area studies course designed for the program which are taught in English. Students may take the summer program only or continue for the full year program. 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 Indonesia then continues for the full academic year. Full-year students will continue their course work at one of the following institutions: Gadjah Mada University, Padjadjaran University, Indonesia Institute of the Arts, Indonesia Dance Institute of Bandung (ASTI), and Advanced School of the Arts at Denpasar (STSI). The course work will depend on language proficiency and area of interest. Of particular interest in Indonesia are courses in music, gamelan, dance, shadow puppetry, and Indonesian area studies.

Thailand. An eight-week summer language program in Chiang Mai will consist of language study and an area studies course designed for the program. Students have three options: summer only, summer and fall, summer and full year. 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 Thailand then continues for the full academic year. Those who remain for the full year will continue language study at Chiang Mai University and take two courses in Thai history and culture. If a student has sufficient language proficiency, he or she may enroll in regular courses at Chulalongkorn University in Bangkok in November. Otherwise the students will continue to do language study and take area studies in Chiang Mai.

AFRICA

Ghana. University of Ghana located northeast of Accra, the capital. Students interested in this program must have serious motivation and capacity for independent study and research. The areas of history and African studies (music, drama, and literature) are especially strong, but students may also pursue research in: ethnomusicology, geography, language, religious studies, and sociology.

Togo. A summer study and field experience. Eight-week (twelve-unit) program of intensive French language study, and a course on contem-

porary Africa (in English), followed by two projects in communities outside of the capital, Lomé. One year of French is required. Freshmen and above may apply.

Kenya. Open to undergraduate and graduate students. As in the British system, students take a year-long program of study in their major or area of specialization. Examinations are given once, at the end of the academic year, and are mandatory for receiving credit.

University of Nairobi. Strengths include courses in the humanities, physical and biological sciences, social sciences; interdisciplinary fields include African studies, development studies, environmental studies.

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. This program is administered by the Council on International Educational Exchange (CIEE).

University of São Paulo. All instruction is in Portuguese. Most EAP students enroll in courses in anthropology, Brazilian literature, economics, geography, history, political science, sociology.

Costa Rica. There are three different programs:

Year Program. EAP participants study at the University of Costa Rica in San Jose. Students take regular university courses in the humanities and social sciences, with at least half of their course work related to Central America. All classes are taught in Spanish. Two years of university-level Spanish required.

Tropical Biology Program. During spring quarter, students who meet certain biology prerequisites may study tropical biology in the rain forest of Monteverde. Previous Spanish is preferred.

Medical Quarter. A seven-week program for fourth-year medical students in the winter quarter, and for second-year medical students during the summer. It includes language and community and family health clinical studies at the University of Costa Rica.

Mexico. *Year Program.* A compulsory intensive language program precedes the beginning of the academic year. This is augmented by a course on contemporary Mexico and is followed by a field placement for four weeks. Students have an option of a full-year program (equal to three quarters) or a part-year program (equal to two quarters). During the academic year, students will take regular courses at the *Universidad Nacional Autónoma de México (UNAM)*.

Language and Society Summer Program, Morelia. One year of university-level Spanish is re-

quired. Summer program provides the equivalent of the entire second year of Spanish. Fifteen units of credit.

Study and Field Experience. Offered in spring and fall quarters, the program is primarily for those who have an interest in studying Spanish, in learning firsthand about Mexico, its people, culture, history, and political and economic structures, and who want to live abroad—but only for one quarter. The program includes intensive language study, and a course taught in English on contemporary Mexico, which combines lectures, cultural and educational field trips, and five weeks of work experience in rural villages. Participants must have completed three quarters of Spanish by the time of participation. Students earn fifteen to eighteen units of UC credit.

Peru. A compulsory intensive language course precedes the beginning of the academic year. All courses are taught in Spanish.

La Católica, Lima. Humanities and social sciences. Anthropology, archaeology, and ethnohistory are of special interest.

SOUTH PACIFIC

Australia. The University of California enables students to study at one of nine universities in Australia: LaTrobe, Monash, and the University of Melbourne in Melbourne, the University of Sydney, the University of New South Wales in Sydney, Flinders University in Adelaide, the University of Wollongong, 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 five universities in New Zealand: the University of Auckland, Lincoln College, University of Otago, Victoria University of Wellington, 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. Students may study for the full academic year. The academic program will consist of courses in the ma-

ior or an allied field through the regular university system. Most disciplines can be accommodated. UBC is renowned for its teaching and research in forestry, bio-technology, micro-electronics and lasers, international business, computer technology, and Pacific Rim studies.

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 presently approved for UC credit may be found in the Opportunities 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.

SELECTION

Participants are chosen on each campus by a faculty/student committee. Basic requirements are: junior standing in the university at the time of participation and a 3.0 GPA. In Austria, Brazil, China, Costa Rica, France, Germany, Mexico, Peru, Portugal, Spain, and the USSR, two years of university-level work in the language of the country with a B average, or the equivalent, are required. Exceptions to this policy include Japan, which requires one year of Japanese at the university level and a compulsory intensive language course preceding the academic year in Japan; Italy, for which one year of Italian is required, but students must take part in a special two-month summer language program in Italy (not required if the student has had two years of university Italian); the Mexico Study and Field Experience Program and Mexico Language and

Society Quarter, which are open to sophomores, juniors, and seniors, with the equivalent of three quarters of university-level Spanish; the Togo Study and Field Experience Program, which is open to sophomores, juniors, and seniors, with the equivalent of three quarters of university-level French; Nanjing and Tianjin, for which only one year of university-level Chinese is required. For Hong Kong, Taiwan and Israel there is no language prerequisite, but prior study of the language is strongly recommended. Students with no language background may participate in the summer language programs in Denmark, Indonesia, or Thailand at the first-year level and return the following summer to receive instruction at the second-year level; they may apply to continue for the full academic year. For Norway, Sweden and Denmark prior study of Norwegian, Swedish, and Danish is recommended, but not required. Students must take an intensive ten-week course at the beginning of the summer in the host country. There is, of course, no language requirement for countries where instruction is in English such as Australia, Canada, Egypt, Ghana, Hungary, India, Indonesia, Kenya, Korea, New Zealand, Thailand, and the United Kingdom/Ireland. In addition to academic criteria for selection, the faculty committee attaches much importance to indications of the student's seriousness of purpose, maturity, and the 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.

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.

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 often 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. In most instances, participants may take their university financial aid with them. Many scholarships specifically for EAP participants are available. Also in the past, funds have been provided by the U.S. Department of State and the University of California for minority and financially disadvantaged students. Scholarships ranging from \$550 to \$3,000 are available for participants in the Pacific Rim countries. There are also a few other country-specific scholarships. Prospective participants who require financial assistance should counsel early with the Student Financial Services Office.

TRANSPORTATION, HOUSING, AND APPLICATIONS

The Education Abroad Program arranges transportation to various study centers. In most study centers a variety of housing facilities is available, including residence halls and private dwellings.

Application forms for admission to the program are available in the Opportunities Abroad Office at the International Center, UCSD, and are given to students following a discussion of various aspects of the program with the EAP counselor. Information on deadlines and related matters such as course offerings, information sessions, selection, schedules of departures, and payment of fees may be obtained from the Opportunities Abroad Office at the International Center, UCSD. It is not too early to begin plan-

ning 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.

UCSD OPPORTUNITIES ABROAD PROGRAM

Ann Craig, Political Science, and Ramon Piñon, Biology, *Faculty Coordinators*

Mary Dhooge, *Dean of International Education*

Catherine Gamon 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. In contrast to EAP participants, students going abroad through the Opportunities Abroad Program earn *transferable* credit from the sponsoring institution. 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 office assists students in selecting a wide range of volunteer, internship, and educational travel programs.

ENGINEERING, DIVISION OF

OFFICE: 7301 Engineering Building, Unit 1, 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 must consult the department of their choice and review the requirements necessary to gain admission.

Remember, admission to the university, even when interest in a major is specified during the application process, is not a guarantee that one can complete a degree program in engineering.

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)
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 during their sixth quarter of study at UCSD. The six-quarter calculation will start with the first quarter in which the student takes one or more of the courses (previously listed in this section) used for admission to engineering. **No admission to an engineering major will be considered after six quarters of study.** This sixth quarter admission re-

view 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, and trends in performance.

Transfer students in engineering may apply for admission to the Division of Engineering at the time of transfer. If not then, 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.

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 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 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.

APPLIED MECHANICS AND ENGINEERING SCIENCES (AMES)

STUDENT AFFAIRS: 4103B Engineering Building, Warren College

Professors

- H. Aref, Ph.D.
 R. J. Asaro, Ph.D.
 H. Bradner, Ph.D., *Professor Emeritus*
 S. Chien, M.D., Ph.D.
 A. T. Ellis, Ph.D., *Professor Emeritus*
 Y. C. Fung, Ph.D., *Professor Emeritus*
 C. H. Gibson, Ph.D.
 D. A. Gough, Ph.D., *Vice-Chairman*
 G. A. Hegemier, Ph.D.
 M. Intaglietta, Ph.D.
 P. A. Libby, Ph.D.
 S.-C. Lin, Ph.D., *Professor Emeritus*
 J. E. Luco, Ph.D.
 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., *Chairman*
 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., *Director, Center for Energy and Combustion Research*
 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.
 F. Seible, Ph.D.
 R. Skalak, Ph.D., *Professor in Residence*
 H. W. Sorenson, Ph.D.
 D. D. Sworder, Ph.D.
 F. E. Talke, Ph.D., *CMRR Endowed Chair*
 C. W. Van Atta, Ph.D.
 F. A. Williams, Ph.D.
 B. W. Zweifach, Ph.D., *Professor Emeritus*

Associate Professors

- P. C. Chau, Ph.D.
 M. Gharib, Ph.D.
 R. K. Herz, Ph.D.
 H. Murakami, Ph.D.
 S. Rand, Ph.D.
 B. D. Rao, Ph.D.
 A. V. Sebald, Ph.D.
 K. Seshadri, Ph.D.
 J. B. Talbot, Ph.D.

Assistant Professors

- D. J. Benson, Ph.D.
 A. H. Chokshi, Ph.D.

- A. Hoger, Ph.D.
 J. B. Kosmatka, Ph.D.
 K. Kreutz-Delgado, Ph.D.
 A. D. McCulloch, Ph.D.
 J. M. McKittrick, Ph.D.
 C. Pozrikidis, Ph.D.
 J. M. Ricles, 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 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 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*
 K. Messmer, M.D., *Adjunct Professor of Surgery*
 R. M. Peters, M.D., *Professor of Surgery and Bioengineering*
 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*
 J. B. West, M.D., Ph.D., *Professor of Medicine and Bioengineering*
 S. L.-Y. Woo, Ph.D., *Professor of Surgery and Bioengineering*

Professional Research Staff

- C. Dong, Ph.D., *Assistant Research Bioengineer*
 K. Fronek, M.D., Ph.D., *Research Physiologist*
 D. Lim, Ph.D., Sc.D., *Research Bioengineer*
 K. L. P. Sung, Ph.D., *Associate Research Bioengineer and Lecturer*
 L. A. Sung, Ph.D., *Associate Research Bioengineer and Lecturer*
 V. E. Tangirala, Ph.D., *Assistant Research Engineer*
 J. L. White, Ph.D., *Research Engineer*
 C. Zhu, Ph.D., *Assistant Research Bioengineer*

DEPARTMENT FOCUS

The instructional and research programs are grouped into seven major areas: bioengineering, chemical engineering, materials science, mechanical engineering, structural engineering, sys-

tems and control engineering, and engineering physics. These programs are characterized by strong interdisciplinary relationships with the Departments of Physics, Mathematics, Biology, Chemistry, Economics, Electrical and Computer Engineering, Computer Science and Engineering and associated campus institutes such as the UCSD Center for Energy and Combustion Research, the Institute for Nonlinear Science, Institute of Geophysics and Planetary Physics, Institute for Pure and Applied Physical Sciences, 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 two separate types of undergraduate programs. The first is a traditional engineering program leading to the **B.S. degree in engineering** with options in bioengineering, chemical engineering, mechanical engineering, structural engineering, systems and control engineering, and engineering science. The second is a two-year upper-division program leading to a **B.A. or B.S. degree in applied science** with options in either applied mechanics or premedical bioengineering. This upper-division applied science program is designed to accommodate students who do not wish to specialize at an early stage in their college careers. While students are expected to complete the same preparation in mathematics, physics, and chemistry as required for the traditional engineering program, all the departmental major course requirements in the two options are confined to the upper division. 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, an accredited program, is a traditional curriculum encompassing studies in organic and physical chemistry, fluid mechanics, heat and mass transfer, separation processes, and reactor and plant design. While many chemical engineering students pursue M.S. or Ph.D. degrees, most seek employment at the B.S. level. Not only are they employed in the traditional petrochemical, food, and polymers industries, but increasing numbers of high-technology industries, such as electronics and aerospace, have employed these students.

Mechanical engineering, an accredited program, is also a traditional four-year curriculum in mechanics, vibrations, thermodynamics, structures, fluid flow, heat transfer, materials, and mechanical design. This program also has a strong systems controls component so that students have a general introduction to the emerging area of robotics. Graduates of this program may enter the high-technology, electro-mechanical industry, as well as traditional employment in the mechanical and aerospace industry.

Structural engineering, an accredited program, concerns the design and analysis of civil, mechanical, aerospace, and ocean structures. Examples include bridges, dams, buildings, aircraft, space craft, 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.

Systems and control engineering, an accredited program, involves mathematical modeling and analysis of complex systems in a wide variety of engineering, physical, and social problems, investigating the dynamics of these sys-

tems, and dealing with methods to control and optimize systems. The term "system" refers to a collection of objects whose characteristics and structure are to be identified for the purposes of predicting and/or controlling its future behavior. Among others, a "system" could be an interplanetary space vehicle, the national economy, a chemical process, or the human circulatory system. Generally, input to and output from the system are observed and used to develop or confirm dynamical mathematical models for the system. With these models, rational decision-making procedures are established and decisions are implemented to achieve prescribed system objectives. In addition to traditional mechanics courses, systems and control engineering students complete sequences in controls, optimization, communication theory, and a micro-processor controls laboratory. With this degree, students are prepared to work in industry or government solving complex interdisciplinary problems.

Bioengineering, an accredited program, is an interdisciplinary major in which the principles and tools of traditional engineering fields, such as applied mechanics, mechanical, 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 the development of medical prosthetics using robotics, 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. While the curriculum prepares students for careers in the biomedical industry, 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. applied science premedical** curriculum has significantly less engineering content and therefore is not an ABET accredited program. It is designed specifically to meet the entrance requirements of most American medical schools and is also suitable for those planning to enter graduate school in bioengineering, physiology, or neurosciences.

The **engineering science** program, which is not accredited by ABET, 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 lab-

oratory 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. While 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. Clearly, students must consult their advisers to develop a sound course of study to fulfill the technical elective requirements of this program.

Applied mechanics is that area of engineering which provides the scientific basis of mechanical, aerospace, and civil engineering. This two-year upper-division program, which is not accredited by ABET, prepares students with breadth in the foundations of these engineering fields. Course work includes applied mathematics, application of computing to engineering problems, fluid dynamics, solid mechanics and structures, particle and rigid-body dynamics, thermodynamics, linear systems analysis, and a sequence in experimental techniques.

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 stu-

dent affairs office for referral to the appropriate AMES faculty member.

MAJOR REQUIREMENTS

Specific course requirements for each major program are outlined in tables in this section of the catalog. 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 Biology 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.

While students with different academic preparation may vary the scheduling of lower-division courses such as math, physics and chemistry, students should consult the department about deviations in scheduling AMES upper-division courses. Most AMES courses are taught only once per year, and courses are scheduled to be consistent with the curricula as shown in the tables. A tentative schedule of course offerings is available in the department each spring.

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 ma-

APPLIED MECHANICS AND ENGINEERING SCIENCES

job charts. 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.

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, structural engineering, and systems and control engineering.

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 PROGRAM IN ENGINEERING

MECHANICAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2AL
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 105A	AMES 102	AMES 170
AMES 163A	AMES 163B	AMES 121C
AMES 130B	AMES 154	AMES 110
HSS	HSS	HSS
SENIOR YEAR		
AMES 101A	AMES 101B	AMES 101C
TE ³	AMES 171A	AMES 171B
AMES 141A	AMES 141B ⁴	TE
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. Nine or ten HSS courses are listed here; individual college requirements may be higher.

² Chem. 7A-B sequence may be taken in place of Chem. 6A-B.

³ One technical elective (TE) must be an upper-division or graduate course in the engineering sciences, natural sciences or mathematics; the other TE must be selected from a list of approved energy, thermo-science courses available in AMES' student affairs office. Both must be selected with **prior** approval of the department to meet ABET standards.

⁴ With departmental approval, AMES 141B may be replaced by AMES 157 or a second energy or thermal science TE to meet ABET standards.

STRUCTURAL ENGINEERING (ABET Accredited Program)

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2AL
Chem. 6A* ²	HSS	AMES 11
HSS ¹	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	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 131A	AMES 132B
HSS	AMES 132A	HSS
SENIOR YEAR		
Math. 120A	AMES 135	Math. 183
AMES 103A	HSS	TE ³
AMES 133	AMES 158	AMES 136 ⁴
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 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. Nine or 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 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.

⁴ With departmental approval, AMES 136 may be replaced by other structural design courses such as AMES 131B.

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/2AL	AMES 111	AMES 153
Chem. 126	Chem. 127	Chem. 128
HSS	HSS	Chem 105A

JUNIOR YEAR

Chem. 141A	Chem. 141B	Chem. 143A
AMES 121A	AMES 163A	AMES 170
AMES 103A	AMES 103B	AMES 103C
HSS	HSS	HSS

SENIOR YEAR

AMES 112	AMES 113B	AMES 114
AMES 113A	AMES 115	TE
AMES 140	AMES 176A	AMES 176B
HSS	TE ²	TE ²

* 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. Nine or ten HSS courses are listed here; individual college requirements may be higher.

² Technical elective (TE) courses must be upper-division or graduate courses in the engineering sciences, natural sciences or mathematics, selected with **prior** approval of the department to meet ABET standards.

ENGINEERING SCIENCE

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2AL
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 105A	AMES 163A	AMES 121C
AMES 101A	AMES 101B	AMES 101C
AMES 130B	AMES 110	AMES 170
AMES 154	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 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.

**BIOENGINEERING
(ABET Accredited Program)**

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*/2AL	Phys. 2B*/2AL
Chem. 6A* ¹	Chem. 6B/6BL	Biol. 1
HSS ²	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 181	AMES 182A	AMES 182B
AMES 154	AMES 163A	AMES 170
AMES 103A	AMES 103B	AMES 183
HSS	Biol. 151	Biol. 153
SENIOR YEAR		
AMES 150A	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, or personnel administration. Nine or ten HSS courses are listed here; individual college requirements may be higher.

**SYSTEMS AND CONTROL ENGINEERING
(ABET Accredited Program)**

FALL	WINTER	SPRING
FRESHMAN YEAR		
Math. 2A*	Math. 2B*	Math. 2C*
AMES 10	Phys. 2A*	Phys. 2B*/2AL
Chem. 6A* ¹	Chem. 6B	AMES 11
HSS ²	HSS	HSS
SOPHOMORE YEAR		
Math. 2DA	Math. 2EA	Math. 2F
Phys. 2C/2CL	AMES 15	HSS
AMES 121A	AMES 121B	AMES 110
HSS	HSS	HSS
JUNIOR YEAR		
Math. 130A	Math. 120A	Math. 120B
AMES 163A	AMES 163B	AMES 170
TE ³	AMES 154	TE
HSS	HSS	HSS
SENIOR YEAR		
AMES 141A	AMES 141B	AMES 141C
AMES 146A	AMES 146B	AMES 146C
AMES 162A	AMES 162B	AMES 162C
AMES 184A	AMES 177A	AMES 177B

* 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, or personnel administration. Nine or ten HSS courses are listed here; individual college requirements may be higher.

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.

**TWO-YEAR UPPER-DIVISION
PROGRAM IN APPLIED SCIENCE**

Lower-Division Program Preparation

Computer Programming

AMES 10

Mathematics

Math. 2A*, 2B*, 2C*, 2DA, 2EA, 2F

Physics

Phys. 2A*, 2AL, 2B*, 2C, 2CL
or 3A*, 2AL, 3B*, 3C, 2CL

Chemistry

Chem. 6A*, 6B, 6BL
or 7A*, 7B, 6BL

Biology

Biol. 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.

† Required only for bioengineering majors and/or Revelle College students.

Upper-Division Major Requirements

APPLIED MECHANICS¹

FALL	WINTER	SPRING
JUNIOR YEAR		
AMES 105A	Math. 120A	Math. 183
AMES 121A	AMES 121B	AMES 130A
AMES 154	AMES 163A	AMES 170
HSS ²	HSS	HSS
SENIOR YEAR		
AMES 101A	AMES 101B	AMES 101C
AMES 130B	AMES 130C ³	AMES 121C
AMES 158	AMES 110	HSS
HSS	AMES 171A	HSS

¹ Students in these programs of study may obtain either the B.A. or B.S. in applied science (applied mechanics or bio-engineering: 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.

² Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher than what is listed here.

³ With departmental approval, AMES 130C may be replaced by either AMES 132A or AMES 133.

BIOENGINEERING: PREMEDICAL¹

FALL	WINTER	SPRING
JUNIOR YEAR		
AMES 181	AMES 182A	AMES 182B
Chem. 140A	Chem. 140B	AMES 170
Chem. 143A	Biol. 131	Biol. 101
HSS ²	HSS	HSS
SENIOR YEAR		
Biol. 156	Biol. 151	Biol. 153
AMES 103A	AMES 103B	AMES 174
TE ³	TE	TE
HSS	HSS	HSS

¹ Students in these programs of study may obtain either the B.A. or B.S. in applied science (applied mechanics or bio-engineering: 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 (see footnote 4).

² Humanities and social science (HSS) courses should be selected to meet general-education requirements of the colleges. Individual college requirements may be higher than what is listed here.

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
UPPER-DIVISION COURSE WORK**

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. 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 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.

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.

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. An AMES faculty adviser is assigned

for each class of students and for each AMES option. A record of advisers' names may be obtained 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, structural engineering, and systems science.

The instructional and research programs are characterized by strong interdisciplinary relationships with the Departments of Electrical and Computer Engineering, Computer Science and Engineering, Economics, Mathematics, Physics and Chemistry, and with associated campus institutes such as the California Space Institute, Center for Magnetic Recording Research, Center of Excellence for Advanced Materials, Institute for Pure and Applied Physical Sciences, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, UCSD Center for Energy and Combustion Research, Institute for Nonlinear Science, and the School of Medicine.

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. program. Policy in this regard is given under the "Master's Degree Program" below.

While students are welcome to seek enrollment in AMES courses via UC Extension's concurrent registration program, 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, engineering physics, and systems science 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 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 Biology 151, 153 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 it also may be used 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 SYSTEMS SCIENCE
SAMPLE PROGRAM

To obtain an M.S. degree in systems science, students can select one sequence in the 100-level courses, and three sequences in the 200-level courses. Note that 162A, B, C or equivalent are prerequisites for 264A, B, C and 248A, B, or equivalent are prerequisites for 241A-B-C.

FALL	WINTER	SPRING
Stat. Communication Theory 162A, or Linear Control System Theory 141A, or Intro. to Optimization 146A	Stat. Communication Theory 162B or Linear Control System Theory 141B or Intro. to Optimization 146B	Stat. Communication Theory 162C or Linear Control System Theory 141C or Intro. to Optimization 146C
Estimation and System Identification 264A	Estimation and System Identification 264B	Estimation and System Identification 264C
Linear and Non-linear Systems 241A	Linear and Non-linear Systems 241B	Linear and Non-linear Systems 241C
Digital Signal Processing 248A	Digital Signal Processing 248B	Special topics in Systems Science 207
Stochastic Processes 262A	Stochastic Processes 262B	Stochastic Processes 262C

NOTE: Not all courses are offered every year.

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
Introductory Compressible Flow 212	Introduction to Combustion 211	Mechanics of Propulsion 213
Controls 141A or 146A or 241A or 246A	Controls 141B or 146B or 241B or 246B	Controls 141C or 146C or 241C or 246C

NOTE: Not all courses are offered every year.

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
Controls 141A or 146A or 241A or 246A	Controls 141B or 146B or 241B or 246B	Controls 141C or 146C or 241C or 246C

NOTE: Not all courses are offered every year.

¹ To be selected from graduate course offerings in Materials Science.

² AMES graduate courses selected in consultation with 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 Mechanics of Composite Materials 233A	Bridge Design 242 or Micromechanics 233B	Earthquake Engineering 239 or Fracture Mechanics 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.

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 Biology 151, 153 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 examination areas must be approved by the department's committee on Graduate Affairs, students are advised to seek such approval well before their expected examination date, preferably while planning their graduate studies. Although students are not required to take particular courses in preparation for the departmental examination, the scope of the examination in each area is associated with a set of graduate courses, generally AMES courses. Thus a candidate can develop a sense of the level of knowledge expected to be

demonstrated during the examination by studying the appropriate syllabi and/or discussing the course content with faculty experienced in teaching the courses involved.

The **Senate Qualifying Examination** is the second examination required of AMES Ph.D. students, and it must be taken no later than four years from the first quarter of registration. It is administered by a committee appointed by the dean of Graduate Studies and Research and consists of both AMES faculty and faculty from other departments. The examination is taken after the student and his or her adviser have identified a topic for his or her dissertation research and initial progress has been made. The candidate is expected to describe his or her accomplishments to date and plans for future work (see "Graduate Studies: the Ph.D.>").

The **Dissertation Defense** is the final Ph.D. examination. As implied, the candidate is expected to describe and defend the main accomplishments of his or her research. The total length of time allowed to complete all requirements for the Ph.D. degree is normative time plus two years (see the "Graduate Studies" section in this catalog).

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.

CANDIDATE IN PHILOSOPHY DEGREE

AMES Ph.D. students who have passed their Departmental and Senate Qualifying Examinations and have advanced to candidacy are awarded the Candidate in Philosophy degree (see "Graduate Studies: Candidate in Philosophy Degree").

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.

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)

FORTRAN 77 computer programming language and its application to the solution of numerical problems. Command and editing in the interactive mode on the VAX computer under the VMS operating system. Emphasis on good programming practices. Priority enrollment given to pre-engineering and engineering majors. (F)

11. Elements of Materials Science (4)

The structure of engineering materials and how these structures can be controlled to produce desired, useful properties. Environmental effects: corrosion and oxidation. *Prerequisites:* Chem. 6A, Phys. 2A or 3A, Math. 2A-B, and Math. 2C (or concurrent registration). Priority enrollment given to pre-engineering and engineering majors. (S)

15. Introduction to Engineering Graphics and Design (4)

Introduction to the basic principles and language of engineering graphics and design. Weekly computer graphics laboratory sessions, along with free-hand and instrument drawing. Graphics topics include sketching; lettering and dimensioning; orthographic, oblique, and axonometric projections; perspective. Lectures and readings on engineering design, including basic design concepts and case histories of design projects. *Prerequisites:* AMES 10 or concurrent enrollment. Priority enrollment given to pre-engineering and engineering majors. (W)

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 registration). (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 nonmetals, 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)

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)

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)

APPLIED MECHANICS AND ENGINEERING SCIENCES

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 registration). 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. 126*. (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 126, 127, 128, 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. 126, 127, 128 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 registration in AMES 115*. (W)

114. 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 112 and 113A-B*. (S)

115. 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)

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:* *Math. 2C and Phys. 2A or 3A with grades of C- or better*. Priority enrollment given to pre-engineering and engineering majors. (F)

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)

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*. (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. (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 registration). (F)

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)

Classical methods of analysis of determinate and indeterminate trusses, beams, and frames including virtual work, slope deflection, and moment distribution methods. Energy principles and matrix methods of elastic structural analysis as applied to complex two- and three-dimensional structures. Step-by-step development of computer codes for the analysis of civil, mechanical, and aerospace structures from the matrix formulation of the classic structure theory, through the direct stiffness formulation, to production-type structural analysis programs. Analysis of structural systems under static and dynamic loads. *Prerequisites:* admission to the major and grades 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 engi-

neering majors.) *Prerequisites:* admission to the major and grade of C- or better in AMES 135. (S)

139. Reliability of Engineering Systems (4)

Safety of time-invariant engineering systems under uncertainty. Review of probability. Probabilistic failure criteria. Single-mode failure. Multicomponent systems. Redundant systems. Fault trees. Problems of design and decision, including economic cost-benefit. Applications to structural, mechanical, and other fields of engineering. *Prerequisites:* admission to the major and grades of C- or better in Math. 183 or AMES 162A or equivalent. With consent of instructor, prerequisite may be taken concurrently. (S)

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)

141A. Linear Control System Theory (4)

Classical analysis and design of continuous linear feedback control systems, emphasizing Laplace transform and frequency-domain methods. Stability by root locus, Bode, Nyquist, and Nichols plots. Transient and steady-state behavior. Error constants. Lead, lags and proportional-plus-integral-plus derivative compensators. *Prerequisites:* admission to the major and grade of C- or better in AMES 163B. (F)

141B. Linear Control System Theory (4)

Extension of AMES 141A. Time-domain, state-variable formulation of the control problem. Feeding back the state variables to gain control of closed-loop poles. The state-transition matrix. The Z-transform: its application to analysis of systems using digital computers as real-time controllers. Design of digital control algorithms. *Prerequisites:* admission to the major and grade of C- or better in AMES 141A. (W)

141C. Problems in System Design (4)

Translation of task requirements into practical system models. Consideration of such problems as stability of continuous and digitally controlled systems, word-length and sampling-rate of digital controllers, accuracy, disturbance rejection, and complexity of implementation. Application of these concepts to a project of current interest in engineering practice. *Prerequisites:* admission to the major and grade of C- or better in AMES 141B. (S)

146A-B-C. Introduction to Optimization and Applications (4-4-4)

Unconstrained optimization. Constrained and discrete optimization. Linear or non-linear programming. Kuhn-Tucker conditions. 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. *Prerequisites:* admission to the major and grades of C- or better in Math. 2EA and 130A. Enrollment in 146B-C requires grades of C- or better in 146A-B. (F,W,S)

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. Advanced FORTRAN Programming for Engineers (4)

Review of FORTRAN 77, VAX command and editing, and good programming practices. Program construction at various levels of complexity beyond that of AMES 10, use of variables of all types, and library programs. Applications to illustrate engineering problems. *Prerequisites:* admission to the major and grades of C- or better in AMES 10 and Math. 2EA. (Students may not receive credit for both AMES 154 and Math. 74.) (F,W)

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). (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. (W,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 101A or 103A, 130B or 181, and 154. (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.

162A. Probability, Random Processes for Engineering (4)

Introduction to probability theory. Random variables, conditional and unconditional distribution functions, characteristic functions, moments, transformation of random variables. Se-

quences of random variables, convergence. *Prerequisites:* admission to the major and grade of C- or better in AMES 163B. (F)

162B. Probability, Random Processes for Engineering (4)

Random processes. Stationary processes: correlation, power spectral density. Gaussian processes and linear transformations of Gaussian processes. Point processes. Sampling theory. Markov processes. *Prerequisites:* admission to the major and grade of C- or better in AMES 162A. (W)

162C. 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 Kalman filters, KF based on continuous time state and discrete measurement model, continuous time KF, Wiener filtering and relationship to Kalman filtering. *Prerequisites:* admission to the major and grade of C- or better in AMES 162A and AMES 162B. (S)

163A. Linear Circuits (4)

Lumped circuits, Kirchhoff's laws, circuit elements, first and second order circuits, steady-state sinusoidal response; computational topics. *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. (W)

170. Experimental Techniques (4)

Principles and practice of measurement and control and the design and conduct of experiments. Technical report writing. Lectures relate to dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, as well as background of experiments and statistical analysis. Experiments relate to the use of electronic devices and sensors. *Prerequisites:* grade of C- or better in AMES 163A, and junior standing in major, and completion of all lower-division physics and chemistry labs required for each AMES major. (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 majors.) *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)

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)

177A. Microprocessor 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 given to systems and control engineering majors.) *Prerequisites:* admission to the major and grades of C- or better in AMES 170, AMES 141A and concurrent registration of AMES 141B or consent of the instructor. (W)

177B. Microprocessor Control Laboratory

Design development course. Students who have completed 177A redesign their projects to make them meet tighter specifications. Students work closely with systems faculty to identify flaws in their design and eliminate them. Extensive computer design evaluations are required. More complex control systems typically evolve to increase the accuracy, speed and robustness of the designs. (Priority enrollment given to systems and control engineering majors.) *Prerequisite:* grade of C- or better in AMES 177A. (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 registration). (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)

190. Numerical Methods in Engineering Science (4)

Numerical methods with computer exercises from various branches of engineering science. Interpolation. Integration. Solution of systems of linear and nonlinear equations. Fast Fourier Transform. Solution of ordinary differential equations. Introduction to numerical partial differential equations. Convergence, stability, error estimation. *Prerequisites:* admission to the major and grade of C- or better in AMES 154 or equivalent. (F)

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 chairman. (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; trans-

port, spectral dynamics, statistical geometry. *Prerequisite:* AMES 214A or equivalent, or consent of instructor.

220A. Statistical Thermodynamics (4)

Fundamentals of statistical mechanics and statistical thermodynamics. Microstates and ensemble averaging. Classical and quantum statistics. The most probable distribution for systems in equilibrium. Derivation of thermodynamic functions. Planck's distribution law and black-body radiation. Chemical equilibrium. *Prerequisite:* AMES 110 or consent of instructor.

220B-C. Kinetic Theory and Transport Phenomena (4-4)

The distribution function in velocity space. The Maxwell-Boltzmann integro-differential equation. Moment equations and Navier-Stokes equations. The dynamics of molecular collisions. Boltzmann's H-theorem. Approximate methods of solution for small departures from an equilibrium state. The linear transport coefficients: viscosity, heat conduction, ordinary diffusion and thermal diffusion. Transport phenomena in weakly ionized gases and in highly ionized plasmas. Radiative heat transfer. Inelastic collisions. Chemical kinetics. *Prerequisites:* AMES 101A-B-C or AMES 103A-B-C, 220A 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)

Survey of numerical methods for fluid flow simulation with computer exercises. Emphasis varies with instructor. Ordinary differential equation models, e.g., boundary layer equations, Lorenz equations. Finite difference methods for simple wave equations. Spectral methods. Turbulence simulations. Vortex methods. Recent developments in CFD. *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.

232. Finite-Element Methods in Solid Mechanics (4)

Review of matrix analysis and variational principles. The use of finite element methods for problems in solid mechanics which involve material as well as geometrical non-linearities. Emphasis is placed on the inelastic deformation of materials. In addition to the quasi-static incremental theory of plasticity, attention is given to the slow transient phenomenon of viscoplasticity and also to dynamic transient problems. *Prerequisite:* AMES 231A or consent of instructor.

233A. Mechanics of Composite Materials (4)

Stiffness, strength, and thermal properties of particle and fiber-reinforced, as well as laminated composites; fracture, fatigue, and failure modes; damage theories and related special topics. *Prerequisites:* AMES 231A-B-C 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. 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.

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 registration) 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.

241A-B-C. Linear and Nonlinear Systems (4-4-4)

Linear spaces, equilibrium equations, linearization, contractions maps, state transition matrix, stability theory, controllability, observability and realizability, pole placement, observers, sensitivity analysis, singularly perturbed systems, nonlinear differential equations. Liapunov and Popov stability, describing functions, Krylov-Bogoliubov asymptotic method. *Prerequisites:* AMES 141A-B and Math. 2EA 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.

246A-B-C. Optimal Control Theory (4-4-4)

Linear vector spaces, Hilbert spaces, minimum norm problems, dual spaces, optimization of functionals, global and local theories; linear optimal control, controllability, sets of attainability, time-optimal control, integral cost criteria; Pontryagin maximum principle, singular control; game theory, matrix difference, differential games, pursuit-evasion, homicidal chauffeur. *Prerequisites:* AMES 146A-B-C or consent of instructor.

248A-B. Methods for Time Series Analysis (4-4)

Discrete-time signals and linear systems; discrete, finite and fast Fourier transforms; digital filter design methods; effects of finite register length; harmonic analysis; stationary random processes; special representation; power spectrum estimators and their bias and consistency; cross spectral estimators; coherence and multiple coherence. *Prerequisites:* AMES 162A-B-C or consent of instructor.

251. Thermodynamics (4)

Principles of thermodynamics of single and multicomponent systems. Phase equilibria. Estimation, calculation, and correlation of properties of liquids and gases. *Prerequisite:* consent of instructor.

252. Chemical Reaction Engineering (4)

Analysis of chemical rate processes; complex kinetic systems. Chemical reactor properties in steady state and transient operations; optimal design policies. The interaction of chemical and physical transport processes in affecting reactor design and operating characteristics. Uniqueness/multiplicity and stability in reactor systems. Applications of heterogeneous reactor systems. *Prerequisite:* consent of instructor.

253. Heterogeneous Catalysis (4)

Physics and chemistry of heterogeneous catalysis; adsorption/desorption kinetics, chemical bonding, isotherms, kinetic models, selection of catalysts, poisoning, experimental techniques. *Prerequisite:* consent of instructor.

254. Biochemical Engineering Fundamentals (4)

Introduction to microbiology as relevant to the main topic, biological reactor analysis. Fermentation and enzyme technology. *Prerequisite:* consent of instructor.

256. Rheology of Fluids (4)

Continuum mechanics of fluids; definition of material functions for viscous and viscoelastic liquids; principles of rheological measurement; relationship to molecular structure. *Prerequisite:* consent of instructor.

257A. Polymer Processing (4)

Analysis of flow fields encountered in major methods of polymer 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.

262A-B-C. Stochastic Processes in Dynamic Systems (4-4-4)

Second order stochastic processes, stochastic integrals and stochastic differential equations, diffusion equations, linear and nonlinear estimation and detection, random fields, optimization of stochastic dynamic systems, applications of stochastic optimization to problems. *Prerequisites:* AMES 162A-B-C or consent of instructor.

264A-B-C. Estimation and System Identification (4-4-4)

Parameter estimation, least-squares, bias consistency, efficiency, mean-square and maximum likelihood estimators, numerical solutions for estimates; estimators for linear dynamic systems. Wiener filter and Wiener-Hopf equation, Kalman filter, Riccati equation, filter stability, smoothing, extended Kalman filter, divergence and divergence control, system identification methods, ARMA and transfer function identification, input signal synthesis, Akaike's criterion. *Prerequisites:* AMES 162A-B-C or 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:* Biology 151 and 153 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:* Biology 151 and 153 or equivalent, or consent of instructor.

272. Biomechanics (4)

An introduction to biomechanics and transport phenomena in biological systems at the graduate level. Biorheology, bio-viscoelastic 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. Laboratory Projects in Bioengineering (4)

Theory of statistical inference, analysis, and design of experiments, data handling by digital computers, video tape recording, etc. Theory and application of optical and electronic instrumentation. The course will consist of lectures, conferences, and demonstrations, as well as the student's own selected laboratory project for study in depth. *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 ultra-structural 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.)

290. Numerical Methods in Engineering Science (4)

Numerical methods with computer exercises from various branches of engineering science. Interpolation. Integration. Solution of systems of linear and nonlinear equations. Fast Fourier transform. Solution of ordinary differential equations. Introduction to numerical partial differential equations. Convergence, stability, error estimation. *Prerequisite:* AMES 154 or equivalent course or consent of instructor.

291. Design and Mechanics in Computer Technology (4)

Design and mechanics problems inherent in computer peripherals such as disk files, tape drives, and printers. Formulation and solution of problems involving mechanics, fluid mechanics, and materials; Reynolds equation, slider bearings; friction and wear; surface roughness; vibrations of rotating disks; introduction to actuator design, dimensional stability of substrate; instrumentation; experimental methods; impact printing; fluid jets; silicon micromechanics. *Prerequisite:* consent of instructor.

292. Computer-Aided Design and Analysis (4)

Introduction to 2-D and 3-D computer aided design. Design problems may include: ball bearing kinematics, Weibull 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 non-linear), 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.)

S. Heather Woll, Ph.D.

Adjunct Professor

Sidney Karin, 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 student must satisfy general-education course requirements determined by the student's college, as well as major requirements determined by the department. The five colleges at UCSD require widely different numbers of general-education courses. Each student should choose his or her college carefully, considering the special nature of the college and breadth of education, realizing that some colleges require considerably more courses than others.

A grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. Admission to CSE majors is based on performance in required lower-division courses.

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.

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-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 honors sequence (Phys. 3A-B-C-D) for Phys. 2A-2B-2C-2D.
3. Phys. 2AL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 3 sequences.
4. CSE 65 or 62B, 64, and 70.
5. ECE 50A-B-C and ECE 52AL-BL-CL.
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 (to be taken in sophomore year), 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 131A-B-C
ECE 132

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., *Chairman*
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.

Associate Professors

Francine D. Berman, Ph.D.
Patrick Dymond, Ph.D.
Victor Vianu, Ph.D.

Assistant Professors

Richard K. Belew, Ph.D.
Laurette Bradley, Ph.D.
Chung-Kuan Cheng, Ph.D.
Garrison Cottrell, 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.
Augustus K. Uht, Ph.D., P.E.

ECE 136A-B
 ECE 140A-B-C
 ECE 141A-B-C
 ECE 146A-B-C
 ECE 152A-B-C
 ECE 154A-B-C
 ECE 159A-B-C
 CSE 162
 CSE 166
 CSE 170C
 CSE 172A-B
 CSE 174
 CSE 176
 CSE 177
 CSE 178A-B
 CSE 180
 CSE 181
 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

honors sequence (Phys. 3A-B-C-D) for Phys. 2A-B-C-D.

3. Phys. 2AL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 3 sequences.
4. CSE 65 or 62B, 64, and 70.
5. ECE 50A-B-C and ECE 52AL-BL-CL.
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-B
- (c) CSE 160A-B
- (d) CSE 170A-B
- (e) CSE 175B-C
- (f) ECE 132
- (g) Technical elective (four units)

Senior Year

- (a) ECE 146B
- (b) ECE 147A
- (c) CSE 161A-B
- (d) CSE 163A
- (e) CSE 171A-B
- (f) CSE 180
- (g) 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 honors sequence (Phys. 3A-B-C) for Phys. 2A-B-C.
3. CSE 65 or 62B, CSE 70

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 166
 CSE 170B/C
 CSE 171B
 CSE 172A/B
 CSE 173
 CSE 174
 CSE 175C
 CSE 176
 CSE 177
 CSE 178A/B
 CSE 180
 CSE 181
 CSE 197, 198 or 199
 ECE 132
 ECE 146A/B/C
 ECE 159A/B/C
 Econ. 172A/B/C
 Math. 160A/B/C
 Math. 170A/B/C
 Math. 172
 Math. 173

MINOR CURRICULA

CSE offers three 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.

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 structure and use of automatic digital computers is provided in CSE 62A and 62B (Introduction to Programming I and II).

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 stamp.

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 codes for telephone registration or department 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 our major curricula must

show evidence that they have completed equivalent prerequisite courses.

Due to large student interest in CSE, admission into the department is limited to only the most qualified students.

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. Master of science and doctor of philosophy degrees in computer science with a computer engineering specialization are under consideration. 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.

The Departments of Computer Science and Engineering and Electrical and Computer Engineering are jointly developing a graduate specialization at the master's and Ph.D. levels. Students interested in this specialization should inquire with their departments as to the proposed curriculum and requirements.

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.

PREPARATION

Applications will be considered from students who have taken undergraduate majors in applied mathematics or computer science. The application deadline is January 15. Fall admission only.

MASTER'S DEGREE PROGRAM

The general requirements for the degree of master of science are stated in the "Graduate Studies" section of the catalog. The department offers the master of science in computer science degree (Plan II Comprehensive Examination only). Students interested in the computer engineering specialization (which is under consideration) should check with the department.

In order to receive the M.S. degree in computer science, 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.

COURSE REQUIREMENTS

1. CSE 264A-B and either 264C or 264D
2. CSE 269 (4 units)

3. Two of the following four sequences
 - a. CSE 270A-B
 - b. CSE 268A-B and either 268C or 268D
 - c. CSE 265A-B-C
 - d. CSE 278A-B

All the above courses must be completed with a grade-point average of 3.0.

Additional graduate courses to complete a total of forty-eight units may be taken in CSE, mathematics, psychology, linguistics, and economics.

THE DOCTORAL PROGRAM

The general requirements of the Ph.D. program are stated in the "Graduate Studies" section of the catalog. In harmony with these requirements, the department has established a set of requirements to be fulfilled in the first two years of the Ph.D. program as described below. Students interested in the computer engineering specialization (which is under consideration) should check with the department.

1. Course Requirements

Ph.D. students are expected to complete the following 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 waiver of the core courses or for the substitution by alternative courses.

Core curriculum for the Ph.D. degree consists of six to nine quarter-courses covering the areas: operating systems, programming languages, architecture, and theory of computation and algorithms. A list of the currently approved core courses can be obtained from the department graduate office.

2. Comprehensive Examination

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. It is offered every year at the start of the fall term. If seven or more students sign up for the written comprehensive examination, the department would offer it again at the start of the spring term. 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.

The second part of the comprehensive examination for Ph.D. students is an oral 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.

DISSERTATION

In order to be admitted to the university qualifying examination, a student must have satisfied the departmental graduate requirements and have been accepted by a faculty member as a Ph.D. thesis candidate. A candidate for the Ph.D. will write a dissertation and defend it in a final oral examination conducted by the doctoral committee.

FINANCIAL AID

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Anticipated stipends for half-time research assistantships are \$944 per month, with the possibility of full-time employment during the summer months. For a half-time teaching assistantship, the anticipated stipend will be \$1,217 per month. Requests for application forms for admission and financial support should be directed to the Department of Computer Science and Engineering. The department generally offers support to graduate students in the Ph.D. program only.

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

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 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. (F) Staff

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. (F,W) Mr. Savitch

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.* (W,S) Mr. Savitch

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.* (S) Mr. Hu

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).* (F,W,S) Mr. Savitch

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. Mr. Savitch

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.* (F,W,S) Mr. Howden

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. Credit not offered for both Math. 71 and CSE 75. *Prerequisites:* CSE 62B/65 or Math. 77; Math. 2C.

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. (F) Mr. Hu

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. (W) Mr. Hu

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. (F) Mr. Burkhard

161B. Data Structures II (4)

Static and dynamic structures, files, secondary storage models, searching. *Prerequisites:* CSE 160A and 161A or equivalent. (W) Mr. Burkhard

162. Programming Languages for Artificial Intelligence (4)

Experience using LISP, PROLOG, and an object-based language to solve typical problems from artificial intelligence (AI). Relative advantages and disadvantages of these languages, and considerations for selecting a language for a particular problem will be discussed. *Prerequisite:* CSE 161A. (F) Mr. Savitch

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. *Prerequisite:* CSE 161A. (W,S) Ms. Bradley

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.) (F,W) Mr. Savitch

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. (W) Mr. Polyzos

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. (F) Mr. Uht

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. (S) Mr. Uht

170C. Digital System Concepts and Design (4)

Structured machine design, algorithmic state machines, microcoding, 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). (S) Mr. Uht

171A-B. Principles of Computer Operating Systems (4-4)

Batch systems, multiprogramming, procedure implementation, processes, parallelism, critical sections, deadlocks, communication, multiprocessing, multilevel memory management, binding, name management, file systems, protection, resource allocation, scheduling. Three hours' lecture. *Prerequisites:* CSE 161A and 170A. (W,S) Mr. Howden

171C. Systems Programming Laboratory (4)

Laboratory focusing on systems programming. Experience with concurrent programming, synchronization mechanisms (e.g., semaphores and monitors), and interprocess communication using message-passing vs. shared memory. Experience with operating systems implementation: process scheduling; I/O buffering; paging and swapping techniques; device drivers and interrupt handlers. *Prerequisite:* CSE 171A. (S) Mr. Pasquale

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. (F,W) Mr. Orailoglu

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. (F; may be offered in W,S, please check with department.) Staff

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. *Prerequisites:* CSE 179, 170B (may be taken concurrently) or consent of instructor. (F,W,S) Ms. Berman

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. (F,W,S) Cheng

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. (F,W,S) Mr. Burkhard

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. (S) Mr. Vianu

177. Computer Graphics (4)

Representation of pictorial data. Two-dimensional and three-dimensional transformations and perspective curves, surfaces, 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. (W) Staff

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. (W) Mr. Belew

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. (S) Mr. Belew

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. (W,S) Mr. Papadimitriou

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, CSE 171A, and CSE 163A. (S) Mr. Howden

181. Informational 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. (S) Mr. Belew

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 chairman.

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)

Topics in computer science and 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

264A. Software Engineering (4)
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.* (F) Mr. Howden

264B. Advanced Operating Systems (4)
Software engineering principles and techniques which are specifically related to the design and implementation of operating systems. Topics include cooperating sequential processes, resource protection, recoverability, and systems programming language. *Prerequisites: CSE 171A-B or consent of instructor.* (W) Mr. Howden

264C. Advanced Compiler Design (4)
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.* (S) Mr. Howden

264D. Database Systems (3)
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.* (S) Mr. Burkhard

265A. Automata, Formal Languages, and Computability (4)
(Formerly CSE 265A-B-C.) Finite automata: non-determinism, regular expressions, regular grammars, 2-way FSAs, minimal stated 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.* (F) Ms. Berman

265B. Computability and Complexity (4)
(Formerly CSE 265A-B-C.) 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. *Prerequisites: CSE 265A and consent of instructor.* (W) Mr. Dymond

265C. Complexity of Intractability (4)
(Formerly CSE 265A-B-C.) Intractability. Relativized complexity. Circuit complexity: size and depth, alternation. Efficient and optimal algorithms: matrix and arithmetic. Axiomatic complexity. Other advanced topics. *Prerequisites: CSE 265B and consent of instructor.* (S) Mr. Dymond

268A. Combinatorial Algorithms (4)
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.* (F) Mr. Hu

268B. Mathematical Programming (4)
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.* (W) Mr. Hu

268C. Topics in Complexity of Algorithms and Data Structures (4)
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. (W) Mr. Saks

268D. Applications of Combinatorial Algorithms (4)
Description of models in VLSI design. Current literature in CAD. Applications of combinatorial algorithms and mathematical programming techniques to circuit layout. Array computation, etc. *Prerequisite: consent of instructor.* (S) Mr. Hu

269. Special Project in Computer Science (1-8)
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: admission to the M.S. program in computer science.* (S/U grades only.) Staff

270A. Principles in Computer Architecture I (4)
Architectural description tools, performance evaluation, uni-processor 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.* (F) Mr. Uht

270B. Principles in Computer Architecture, II (4)
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 270A or consent of instructor.* (W) Mr. Uht

278A. Advanced Artificial Intelligence I (4)
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.* (F) Mr. Belew

278B. Advanced Artificial Intelligence II (4)
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 278A.* (W) Mr. Belew

279. Algorithm Design and Analysis (4)
The basic techniques for the design and analysis of algorithms. Divide-and-conquer, dynamic programming, data structures, graph search, algebraic problems, randomized algorithms, lower bounds, probabilistic analysis, parallel algorithms. (W) Mr. Papadimitriou

280A. Special Studies in Computer Science (1-4)
(Formerly CSE 280.) Topics of special interest in computer science to be presented by staff members and graduate students under faculty direction. Subject matter to be announced before each quarter. (S/U grades only.) *Prerequisite: consent of instructor.* Staff
(Offered as faculty resources permit.)

280Z. Advanced Topics in Database Theory (2)
(Formerly CSE 280.) The seminar will cover current research topics in database theory. Specific topics covered will depend on participants' interests. (S/U grades only.) *Prerequisite: consent of instructor.* Mr. Vianu
(Offered as faculty resources permit.)

281A. Special Topics in Computer Science (1-8)
(Formerly CSE 281.) A course to be given at the discretion of the faculty at which topics of current interest in computer science will be presented by visiting or resident faculty members. (S/U grades permitted.) *Prerequisite: consent of instructor.* Staff
(Offered as faculty resources permit.)

281L. Advanced Computer Networks (4)
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.) (S) Mr. Polyzos

281M. Computer Vision (4)
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. (S/U grades permitted.) Mr. Kube
(Offered as faculty resources permit.)

281N. Distributed Computation (4)
(Formerly CSE 281.) Distributed computation and communication; resource management: naming, synchronization, concurrency control, fault tolerance, security; performance measures; applications: files, databases, operating systems. (S/U grades permitted.) *Prerequisite: consent of instructor.* Staff
(Offered as faculty resources permit.)

281P. Connectionists Models and Cognitive Processes (4)
(Formerly CSE 281.) 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 278B or equivalent experience.* Mr. Cottrell
(Offered as faculty resources permit.)

281Q. Topics in Distributed Artificial Intelligence (4)
(Formerly CSE 281.) 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 278B recommended.* Mr. Pasquale
(Offered as faculty resources permit.)

281R. Computer Systems Performance Evaluation (4)
(Formerly CSE 281.) Topics in the evaluation of computer systems performance, including: definition of performance indices; measurement techniques; analytic and simulation techniques; workload characterization; tuning therapies and self-tuning mechanisms; performance of computer networks and distributed systems; parallel program performance. (S/U grades permitted.) *Prerequisites: CSE 264B and consent of instructors.* Mr. Paris and Mr. Pasquale
(Offered as faculty resources permit.)

281S. Knowledge Bases (4)

(Formerly CSE 281.) 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.* Mr. Vianu (Offered as faculty resources permit.)

281T. Machine Learning (4)

(Formerly CSE 281.) 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: 278B.* Mr. Belew (Offered as faculty resources permit.)

281U. Design Systems for VLSI Circuits I (4)

(Formerly CSE 281.) 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.* Mr. Cheng (Offered as faculty resources permit.)

281V. Design Systems for VLSI Circuits II (4)

(Formerly CSE 281.) 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.* Mr. Orailoglu (Offered as faculty resources permit.)

281W. Natural Language Processing (4)

(Formerly CSE 281.) A survey of the traditional approaches to natural language processing including basic parsing, knowledge representation, and discourse analysis. Material covered in the survey will be chosen from such topics as augmented transition networks, case grammars, semantic networks, and unification grammar. (S/U grades permitted.) *Prerequisite: graduate standing and either 178B or consent of instructor.* Mr. Savitch (Offered as faculty resources permit.)

281X. Parallel Algorithms (4)

(Formerly CSE 281.) An introductory course in parallel algorithms. Introduction to the models of parallel computation: parallel random access machines, circuits and networks; desirable and feasible models; routing in networks; unbounded Fanin parallelism; parallel comparison problems; parallel graph algorithms; probabilistic algorithms; other current topics. (S/U grades permitted.) *Prerequisites: CSE 179 and CSE 265B or consent of instructor.* Mr. Paturi (Offered as faculty resources permit.)

281Y. Topics in Parallel Computation (4)

(Formerly CSE 281.) This course focuses on the interrelationship of parallel architectures, algorithms, programming environments, Flynn's taxonomy, shared vs. non-shared memory, dataflow, VLSI models, PRAM, type architectures, paracomputer. Programming environments: program decomposition, mapping, debugging, language issues. (S/U grades permitted.) *Prerequisite: graduate standing.* Ms. Berman (Offered as faculty resources permit.)

281Z. Topics in Parallel Complexity Theory (4)

(Formerly CSE 281.) Advanced seminar in theoretical aspects of parallelism including variants of parallel computation thesis, circuits and PRAM models, speedup of sequential computa-

tions, universal parallel machines, inherently sequential problems, complexity classes AC, NC, SC. (S/U grades permitted.) *Prerequisite: CSE 265B and consent of instructor.* Mr. Dymond (Offered as faculty resources permit.)

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 chairman.*

ELECTRICAL AND COMPUTER ENGINEERING (ECE)

OFFICE: 2904 Engineering Building, Unit I, Warren College

Professors

- Hannes Alfvén, Ph.D., *Professor Emeritus*
- Victor C. Anderson, Ph.D., *Professor Emeritus*
- Peter M. Asbeck, Ph.D.
- Neal H. 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.
- 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., *Chairman*
- M. Lea Rudee, Ph.D., *Dean, Division of Engineering*
- Andrew J. Viterbi, Ph.D.
- Harry H. Wieder, Ph.D.
- Jack K. Wolf, Ph.D.

Associate Professors

- George J. Lewak, Ph.D.
- Larry G. Meiners, Ph.D.
- Kevin B. Quest, Ph.D.
- Charles W. Tu, Ph.D.
- Paul Yu, Ph.D.

Assistant Professors

- Shankar Chatterjee, Ph.D.
- Paul M. Chau, Ph.D.
- Rene L. Cruz, Ph.D.
- Sadik Esener, Ph.D.
- Ronald D. Fellman, Ph.D.
- Clark Guest, Ph.D.
- Karen L. Kavanagh, Ph.D.
- Ting-Ting Lin, Ph.D.
- Ramesh R. Rao, Ph.D.

Adjunct Professors

- James U. Lemke, Ph.D., *Center for Magnetic Recording Research*
- John C. Mallinson, *Adjunct Professor, Center for Magnetic Recording Research*

Associated Faculty

- Gustaf O.S. Arrhenius, Ph.D., *Professor, Scripps Institution of Oceanography*
- William B. Hodgkiss, Ph.D., *Associate Professor, Scripps Institution of Oceanography*
- Bhaskar D. Rao, Ph.D., *Assistant Professor, AMES*
- Anthony V. Sebald, Ph.D., *Associate Professor, AMES*
- Harold W. Sorenson, Ph.D., *Professor, AMES*
- David D. Sworder, Ph.D., *Professor, AMES*

THE MAJOR PROGRAMS FOR UNDERGRADUATES

The department offers four-year programs in electrical engineering, engineering physics, and computer engineering. These programs, which lead to the B.S. degree, prepare students for employment in the electrical, electronics, computer, or communications industries, and for graduate work in those fields. In addition, the department offers programs leading to the B.A. degree in applied physics and information science. These are intended for students desiring more time for undergraduate studies outside their major subject. They prepare students for graduate study in their respective fields, as well as for certain types of employment.

To graduate in four years with a B.S. in computer engineering, electrical engineering or engineering physics, 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).

The electrical engineering curriculum features five specializations: communication systems, electronic systems, electronic devices and materials, photonics, and systems and control. The computer engineering program treats hardware design; data storage, computer architecture, as-

sembly languages, and the design of computers for engineering, information retrieval, and scientific research. The engineering physics program provides a strong background in physics and mathematics and permits specialization in acoustics, optics, continuum mechanics, or materials science. This program is conducted in cooperation with the Departments of Physics and Applied Mechanics and Engineering Sciences.

Applied physics treats electromagnetism, electronics, optical information processing, and acoustical signal processing. Information science concentrates on communication systems and the processing of information. The B.A. curricula allow individual programs that may involve a combination of the fields in which the department offers instruction.

CSE 65 or 62B is recommended for all ECE majors. All students intending to do experimental work after graduation, whether in industry or in graduate school, are advised to take ECE 50A-B-C, ECE 132, ECE 146A-B-C, and ECE 138 or CSE 175B. A grade-point average of 2.0 will be required in upper-division courses in the major, including technical electives. Admission to ECE majors will continue to be based on GPA in required lower-division courses.

A total of at most four units of ECE 197 (or AIP 197 with approval of ECE faculty member), 198, and 199 may be applied in fulfilling the requirements for a major program in the Department of Electrical and Computer Engineering. These must be taken on a Pass/Not 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. This is accomplished by applying for admission to the graduate program 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.

ENGINEERING

The department offers B.S. programs in computer engineering, electrical engineering, and engineering physics. For graduation, each student must satisfy general-education course requirements determined by the student's college, as well as major requirements determined by the department. The five colleges at UCSD require widely different numbers of general-education

courses. Each student should choose his or her college carefully, considering the special nature of the college and breadth of education, realizing that some colleges require considerably more courses. In such colleges, students may be unable to complete the electrical engineering or computer engineering program in four years. Students wishing to transfer to another college should see their college adviser. Students are urged to discuss their curriculum with the appropriate departmental adviser no later than the spring quarter of their freshman year.

Graduates of junior colleges may enter these programs in the junior year. Transfer students should be mindful of the sophomore-year course requirements when planning their programs.

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.

The required lower-division courses are:

- (i) Math. 2A-2B-2C, 2D or 2DA, 2E or 2EA, 2F.
- (ii) 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 honors sequence Phys. 3A-3B-3C-3D for Phys. 2A-2B-2C-2D.
- (iii) Phys. 2AL and Phys. 2CL or 2DL (limited enrollment). These should be taken concurrently with the Phys. 2 or Phys. 3 sequences.
- (iv) CSE 62B or CSE 65, CSE 64 and ECE 80 or CSE 70.
- (v) ECE 50A-50B-50C and ECE 52AL-52BL-52CL.

- (vi) 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 132
- (c) CSE 175B-C
- (d) ECE 152A-B
- (e) CSE 160A-B
- (f) CSE 170A-B
- (g) Technical elective (four units)

Senior Year

- (a) ECE 146B
- (b) ECE 147A
- (c) CSE 161A-B
- (d) CSE 163A
- (e) CSE 171A-B
- (f) CSE 180
- (g) Technical electives (eight units)

Electives

Any upper-division or graduate course from either the ECE or CSE department, except ECE 138, may be used as a technical elective.

ELECTRICAL ENGINEERING

The electrical engineering curriculum comprises studies in communication systems, electronic systems, electronic devices and materials, photonics (or opto-electronic engineering) and systems and control; an option in any one of these fields may be selected by the student.

The curriculum in electrical engineering has been accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.

The required lower-division courses for all options are:

- (i) Math. 2A-2B-2C-2DA-2EA-2F.
- (ii) 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 honors sequence Phys. 3A-3B-3C-3D for Phys. 2A-2B-2C-2D.
- (iii) Phys. 2AL and Phys. 2CL or 2DL (Limited enrollment). These should be taken concurrently with or after the Phys. 2 or Phys. 3 sequences.
- (iv) CSE 65 or 62B, 64, and ECE 80 or CSE 70.

(v) ECE 50A-B-C and ECE 52AL-BL-CL. These sequences are normally taken in the sophomore year.

(vi) Chem. 6A or 7A

The upper-division course requirements depend on the option selected by the student. The following are the requirements for the various options.

1. Communication Systems Option

Junior Year

ECE 105A-B-C, ECE 152A-B-C
ECE 132
ECE 138 or CSE 175B
technical elective (twelve units)

Senior Year

ECE 154A-B-C, ECE 146A-B
ECE 146C or ECE 150A
ECE 159A and ECE 159D
technical elective (eight units)

2. Electronic Systems Option

Junior Year

ECE 105A-B-C, ECE 152A-B-C
ECE 132, ECE 135A-B
ECE 138 or CSE 175B
technical elective (eight units)

Senior Year

ECE 131A-B-C
ECE 146A-B, ECE 146C or ECE 150A
technical elective (twelve units)

3. Electronic Devices and Materials Option

Junior Year

ECE 105A-B-C, ECE 152A-B
ECE 132, ECE 135A-B
ECE 138 or CSE 175B
technical elective (twelve units)

Senior Year

ECE 131A-B-C
ECE 136B, ECE 149
Any two out of ECE 146A, 146B, and 146C
technical elective (eight units)

4. Photonics Option

Junior Year

ECE 105A-B-C, ECE 135A-B
ECE 132 and any two of ECE 140D-E-F
ECE 152A-B
technical elective (eight units)

Senior Year

ECE 131A-B, ECE 146A-B, ECE 138, ECE 141A-B-C
technical elective (four units)

5. Systems and Control Option

Junior Year

ECE 105A-B-C, ECE 132, ECE 152A-B-C

CSE 170A-B, CSE 175B
technical elective (eight units)

Senior Year

AMES 141A-B-C, ECE 159A-B-[C or D]
technical elective (twelve units)
(AMES 146A-B-C recommended)

Electives for all options.

Any ECE upper-division courses; other upper-division courses with the approval of the adviser.

ENGINEERING PHYSICS

The engineering physics program comprises studies in acoustics, optics, continuum mechanics, materials science, and solid state electronics. An option in any one of these fields may be selected by the student.

The required lower-division courses for all options are:

- (i) Math. 2A-2B-2C-2DA-2EA-2F
- (ii) Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D
- (iii) Phys. 2AL, 2CL, 2DL or ECE 52AL-BL, Phys. 2DL
- (iv) CSE 65 or 62B, CSE 64 or ECE 80 or CSE 70
- (v) ECE 50A-50B-50C
- (vi) Chem. 6A or 7A

1. Acoustics Option

Junior Year

ECE 105A-B-C
ECE 131A-B-C or Phys. 100A-B-C
ECE 152A-B-C
Phys. 110A-B, ECE 132

Senior Year

ECE 142AL-BL-CL
Phys. 130A-B, Phys. 152
ECE 146A-B, AMES 110
AMES 101A-B-C

2. Optics Option

Junior Year

ECE 105A-B-C
ECE 131A-B-C or Phys. 100A-B-C
ECE 140D-E-F or
ECE 152A-B-C or
ECE 135A-B, CSE 175B or ECE 138
Phys. 110A-B, ECE 132

Senior Year

ECE 141A-B-C
Phys. 130A-B, Phys. 152 or ECE 136B
ECE 146A-B, AMES 110
ECE 152A-B-C or ECE 154A-B-C or
ECE 135A-B, CSE 175B or ECE 138

3. Continuum Mechanics Option

Junior Year

AMES 130A-B-C

ECE 105A-B-C
ECE 131A-B-C or Phys. 100A-B-C
Phys. 110A-B or AMES 121A-B(*)
ECE 132

Senior Year

AMES 101A-B-C
Phys. 130A-B, Phys. 152
Phys. 140A-B
ECE 146A-B or AMES 170, 171A
AMES 110

4. Materials Science Option

Junior Year

ECE 105A-B-C
AMES 102, Chem. 126 or 131, ECE 132
Phys. 110A-B or AMES 121A-B(*)
ECE 131A-B-C or Phys. 100A-B-C

Senior Year

ECE 133, ECE 137
Phys. 130A-B
ECE 135A-B, ECE 136B or
(ECE 146A-B, ECE 146C or ECE 149)
Phys. 140A-B, Phys. 152

(*)Warren College students may take the sequence marked (*) in the sophomore year in order to have time in the junior year for the upper-division sequence in their noncontiguous minor. Alternatively they may petition to take this upper-division noncontiguous sequence in the sophomore year.

5. Solid State Electronics Option

Junior Year

ECE 105A-B-C
ECE 131A-B-C or Phys. 100A-B-C
ECE 135A-B, CSE 175B or ECE 138
ECE 152A-B, ECE 132

Senior Year

Phys. 110A, ECE 133, ECE 136B
ECE 146A-B, ECE 146C or ECE 149
Phys. 140A-B
Phys. 130A-B

THE B.A. CURRICULA

APPLIED PHYSICS

The required lower-division courses are:

- (i) Math. 2A-2B-2C-2DA-2EA
- (ii) Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D
- (iii) Phys. 2AL and Phys. 2CL or 2DL
- (iv) Chem. 6A or 7A
- (v) CSE 65 or 62B, 64
- (vi) ECE 50A-50B-50C and 52AL-BL-CL
Math. 2F is recommended.

A total of fifteen upper-division courses, approved as a coherent program by the adviser, must be passed with a minimum 2.0 grade-point average 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 131A-B-C
ECE 135A-B, ECE 136A or 136B or 137 or 149
ECE 140D-E-F
ECE 132 and any two out of ECE 146A, 146B, and 146C or ECE 150A.
- (c) At least eight units of undergraduate laboratory courses selected from the following:
ECE 133, 136B, 137,
CSE 175B or ECE 138
ECE 141A-B-C
ECE 142AL-BL-CL
Phys. 121

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.

Acoustics

ECE 105A-B-C, 131A-B-C,
142AL-BL-CL,
152A-B-C

Electronics

ECE 105A-B-C, 131A-B-C, 132,
135A-B, CSE 175B or ECE 138, 136A-B,
and any two of ECE 146A, 146B, and 146C
or ECE 150A

Optics

ECE 105A-B-C, 131A-B-C,
140D-E-F, 141A-B-C,
152A-B-C; or Phys. 130A-B
and ECE 135A; or ECE 135A-B, 136A

Solid State

ECE 105A-B-C, 131A-B-C,
132, 137 or 149
ECE 135A-B
ECE 136A or 136B, Phys. 130A-B
and any two of ECE 146A, 146B, and 146C

INFORMATION SCIENCE

This program is less intensive than the programs in electrical engineering listed above. The required lower-division courses are:

- (a) Math. 2A-B-C-DA-EA-F
- (b) Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D
- (c) ECE 50A-B-C
- (d) CSE 65 or 62B

A total of fifteen upper-division courses must be passed with a minimum grade-point average of 2.0 in order to complete the major program. As early as possible, preferably before the beginning of the junior year, the student must discuss the curriculum with the information science faculty adviser. Options in communication systems, electronics, 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 areas of applied physics and information science. 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 an ECE 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.

Acoustics

ECE 131A-B-C, ECE 142AL-BL-CL

Communication Systems

ECE 152A-B-C, ECE 154A-B-C

Digital Hardware

ECE 50A, CSE 65, 70, 170A, CSE 175B or
ECE 138, and ECE 147

Electromagnetic Waves

ECE 140D-E-F, ECE 131A-B-C

Electronic Circuits

ECE 50B-C, ECE 132,
ECE 146A-B-C

Electronic Devices

Phys. 2C-2D, ECE 135A, ECE 135B,
ECE 136A or 136B, ECE 132

Applied Optics

ECE 140D-E-F, ECE 141A-B-C

Queueing Systems

CSE 65 or 62B, CSE 70, CSE 161A,
ECE 159A-B-C

Signal Analysis

ECE 50A-B-C, ECE 152A-B-C

ADMISSION TO UPPER-DIVISION COURSES

The Department of Electrical and Computer Engineering will attempt to provide sufficient sections of all lower-division ECE 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:

- (a) Students admitted by the department to a major or minor curriculum, and
- (b) Students fulfilling a requirement for another major.

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 ECE courses will require the departmental stamp on the registration form, and it will be given only by the undergraduate affairs staff.

Students who wish to enroll in an ECE major should apply in accordance with the Division of Engineering admissions policy (above). Transfer students who wish to enter a major curriculum directly must show evidence that they have completed equivalent prerequisite 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 to present the department a copy of their records for evaluation of eligibility prior to enrolling in ECE courses.

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 PROGRAMS

There are four main divisions of study:

1. COMPUTER ENGINEERING

The Department of Electrical and Computer Engineering and the Department of Computer Science and Engineering are jointly developing a graduate specialization at the master's and Ph.D. levels. Students interested in this specialization should inquire at their departments as to the proposed curriculum and requirements.

2. ELECTRICAL ENGINEERING (APPLIED PHYSICS)

This division includes the following areas of study:

(a) Radio Astronomy and Space Physics.

The theoretical and experimental investigation of physical processes relating to the structure of the sun and planetary bodies. Current studies are related to planetary atmospheres, ionospheres, magnetospheres, the nature of the solar wind and solar corona, comets, asteroids, interplanetary dust, and condensation of matter in space.

The department has available the facilities of several radio astronomical observatories. In addition a large local radio observatory has been established to observe the structure of the solar wind by means of radiostar scintillations.

(b) Materials Science and Solid State Electronics. The field of materials science 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 construction, evaluation, and modeling of prototype electronic devices and integrated circuits based on silicon and III-V compound semiconductors and of processing methods and techniques employed in present-day or projected large-scale integrated circuit applications. Current research interests include the metallurgical aspects of interfaces, the study of superconductors and tunneling phenomena, magnetic materials, 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 backscattering facility, molecular beam epitaxial deposition system, liquid phase epitaxial apparatus, cryogenic temperature facilities and auxiliary apparatus for x-ray, optical, electro-optic, electrical and galvanomagnetic characterization of materials, devices, and components.

(c) Applied Optics and Photonics. This field involves the application of systems combining

optics and electronics to image processing, parallel computing, and fiber optics communication. Current system studies include hybrid optical/electronic processing, optical processing with feedback and nonlinearity, optical associative memory, optical neural nets, robotic vision (optical pattern recognition), and digital optical computing systems. Algorithmic and architectural studies on these parallel optical processing systems are complemented by studies on optoelectronic devices involving optical spatial light modulators as logic and memory devices, nonlinear optical crystals for image amplification, logic and 3-D memory, and computer aided designed diffractive optics and micro-optics for optical interconnects used in optical processors and VLSI circuits. Integrated optical circuits, fiber optics, guided wave modulators, integrated optical and electronic devices on III-V semiconductors, semiconductor injection lasers and detectors are studied for optical communication. The applied optics program has available extensive facilities for optical system and device research. A number of lasers (e.g., argon, krypton, dye, carbon dioxide, helium neon, color center, Nd/YAG and gallium arsenide lasers), detectors, infra-red vidicons, spectrometers, interferometers, a considerable amount of high-quality optics and more than fifteen vibration-isolation tables are available. In addition to research into new types of spatial light modulators, several liquid crystal light valves, microchannel/spatial light modulators, and a Pockels readout optical modulator are available. Facilities available for microfabrication of optoelectronic circuits and devices including an r.f. and magnetron sputtering system, plasma etching, reactive ion beam etching, plasma enhanced chemical vapor deposition, low-pressure chemical vapor deposition pyrogenic oxidation, a liquid-phase epitaxy system, molecular beam epitaxy system CAD workstations, an electron beam, and a photo lithography facility, and diffusion furnaces.

(d) Magnetic Recording. Magnetic recording is an interdisciplinary field involving physics, material science, communications, and mechanical engineering. The physics of magnetic recording involves studying magnetic heads, recording media, and the process of transferring information between the heads and the medium. General areas of investigation include: nonlinear behavior of magnetic heads, very high-frequency loss mechanisms in head materials, characterization of recording media by micromagnetic and many body interaction analysis, response of the medium to the application of spatially varying vectorial head fields, fundamental analysis of medium nonuniformities leading to media noise, and experimental studies of the channel transfer

function emphasizing non-linearities, interferences, and noise.

Current projects involve utilization of the Cray X-MP 48 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.

3. ELECTRICAL ENGINEERING (COMMUNICATION THEORY AND SYSTEMS)

Communication Theory and Systems in ECE involves the detection of signals and the transmission and processing of information in the acoustic, radio, and optical domains, the prediction and filtering of random processes, design and analysis of communication systems, and the propagation of acoustic and electromagnetic waves. Additional research is being performed in the areas of protocols for communication networks and the use of error correction techniques for spread spectrum and other digital communication systems, and for recording data in magnetic storage media. Applications are made to such fields as communications, radar, sonar, oceanography, holography, image processing, and visibility in air and water. Information processing is carried out by electronic, acoustic, and optical filtering, photographically and by digital computers. Both theoretical and practical aspects of information processing are studied. Both the master of science and the doctor of philosophy degrees are offered.

4. INTERDEPARTMENTAL CURRICULUM IN APPLIED OCEAN SCIENCE

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 man's purposeful and useful 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.

Preparation

Applications will be considered from students who have taken undergraduate majors in one of the following disciplines: applied mathematics, applied physics, computer science, electrical engineering, engineering physics, engineering science, mathematics, and physics. Applications will also be considered from students who wish to take interdisciplinary programs.

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 department offers master's degree programs in electrical engineering (applied physics), and electrical engineering (communication theory and systems). In electrical engineering both Plan I and Plan II are offered with the same course requirements. Either plan calls for forty-eight units, which is more than the thirty-six units minimum university requirement. However, Plan I requires six units of research with an adviser under ECE 298 or 299. Normally no financial support is offered to students enrolled in the M.S. program.

1. COMPUTER ENGINEERING

Students interested in this specialization at the master's level should inquire at their departments as to the proposed curriculum and requirements.

2. ELECTRICAL ENGINEERING

A. Applied Physics

The M.S. program in electrical engineering (applied physics) includes the fields of radio astronomy and space physics, materials science, applied optics, and electronic devices and materials. 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 232A-B-C
- ECE 220A-B-C
- ECE 241A-B-C
- ECE 242A-B-C

- ECE 251A-B-C
- Phys. 203A-B
- Phys. 211, Phys. 212B-C

In addition, elective courses to complete a total of forty-eight units must be taken. The specific core and elective courses to be selected must be approved by the graduate adviser. The intention of the core courses is to ensure adequate breadth.

B. 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. To complete the program, a student must satisfy the course requirements and either pass a comprehensive examination (for M.S. Plan II) or write a master's thesis (for M.S. Plan I). Students with a good undergraduate background can complete the program in one year of full-time study.

Course Requirements

1. Core Courses:
ECE 250A-ECE 256A, ECE 254A, ECE 260A
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 254B-C
ECE 250B
ECE 256B
Electives

In addition, Plan I students must take three technical electives and Plan II students must take four. These electives must be chosen among graduate ECE, CSE, AMES, mathematics, and physics courses. ECE 159A is also admissible.

2. Comprehensive Examination:
A comprehensive examination on upper-division undergraduate material in applied mathematics, communication theory, signal analysis, probability, and random processes is given in the fall and spring quarters. It must be taken during the first year of graduate study. Students who are unable to attain a satisfactory score in their first attempt must retake the examination the next time it is offered and pass it with a satisfactory score.

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 applications 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 M.S. comprehensive examination will be taken into account.

THE DOCTORAL PROGRAMS

The department has established a set of requirements applying to the first two years of the Ph.D. program as described below. Ph.D. students are expected to maintain, on an annual basis, a 3.4 grade-point average for the core courses. They must pass a comprehensive examination.

In the second year graduate students are expected to devote at least half their time to research and must present the results of their research before a committee of three faculty members in a research examination.

Ph.D. students entering with a master's degree may petition for waiver of the core courses or for substitution of alternative courses. Students who have satisfied these departmental graduate requirements may register for any ECE course on a satisfactory/unsatisfactory basis.

A. APPLIED OCEAN SCIENCES

1. 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.

2. 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.

B. COMPUTER ENGINEERING

Students interested in this specialization at the Ph.D. level should inquire at their departments as to the proposed curriculum and requirements.

C. ELECTRICAL ENGINEERING (APPLIED PHYSICS)

1. Core Courses:
Math. 210A-B-C or AMES 294A-B-C, and two

sequences (twenty-four units) selected normally from the following:

ECE 232A-B-C
ECE 220A-B-C
ECE 241A-B-C
ECE 242A-B-C
ECE 251A-B-C
Phys. 203A-B
Phys. 211, 212A-B

The specific courses to be selected must be approved by the graduate adviser. The intention of the core courses is to ensure adequate breadth.

2. Comprehensive Examination:

Students majoring in electrical engineering (applied physics) are required to take a written comprehensive examination in the first year of graduate study at UCSD. It is offered twice a year, in the fall and spring quarters. The examination may be repeated once.

D. ELECTRICAL ENGINEERING (COMMUNICATION THEORY AND SYSTEMS)

Students who have been admitted to study for the Ph.D. degree in communication theory and systems, 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. They must pass at least five graduate courses during their first year of full-time study.

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 nevertheless complete the M.S. core course requirements. In addition, the M.S. comprehensive examination must be taken during the first year. They must pass at least eight graduate courses during their first year of full-time study.

All students admitted to study for the Ph.D. must attain a cumulative grade-point average of 3.4 in the core courses.

Upon enrollment in the Ph.D. program a student must secure a faculty adviser, 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 the research project and is questioned to determine his or her understanding of the field of research.

DISSERTATION

In order to be admitted to the university qualifying examination, a student must have satisfied the departmental graduate requirements and have been accepted by a faculty member as a Ph.D. thesis candidate. A candidate for the Ph.D. will write a dissertation and defend it in a final oral examination conducted by the doctoral committee.

FINANCIAL AIDS

Financial support is available to qualified graduate students in the form of fellowships, loans, and assistantships. Stipends for half-time research assistantships are \$988 per month, with the possibility of employment during the summer months. For a half-time teaching assistantship the stipend is \$1,274 per month. Requests for application forms for admission and financial support should be directed to the Department of Electrical and Computer Engineering.

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).

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 courses. For the names of the instructors who will teach the courses, please refer to the quarterly *Schedule of Classes*. CSE 65 and CSE 62B are interchangeable as prerequisites for other courses.

LOWER DIVISION

5A. Our Natural and Artificial Environment: Atmosphere (4)

Descriptive introduction to the basic nature of the earth's atmosphere. Its interaction with the ocean and biosphere. Chemical and thermal pollution (effects of CO₂, aerosols, dust, etc.) and their climatic impact. Conventional and nonconventional energy resources and their environmental impacts. Three hours' lectures. *Prerequisite: none.* (F) Mr. 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 application and system design of analog and digital electronic systems; the evolution of computers and how they function. Three hours' lecture. *Prerequisite: none.* (S) Mr. 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' lecture. *Prerequisite: none.* (S) Mr. Lau, Ms. Kavanagh, or Mr. Yu

50A. Linear System and Circuit Analysis (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. Three hours' lecture, one hour's recitation. *Prerequisites: Math. 2B and Phys. 2B or 3B (may be taken concurrently).* (F) Mr. Lugannani

50B. Linear System and Circuit Analysis (4)

The Laplace transform; inverse transform; partial fraction expansions; 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. Three hours' lecture, one hour's recitation. *Prerequisites: ECE 50A and Math. 2DA (may be taken concurrently).* (W) Mr. Lugannani

50C. Linear System and Circuit Analysis (4)

Two-port networks; sinusoidal steady-state analysis; frequency response plots; Bode plots; stability and the Nyquist criterion; optimum power transfer; periodic functions and Fourier series; evaluation of Fourier coefficients; steady-state network response to periodic inputs; the Fourier transform and inverse Fourier transform; application to network analysis. Three hours' lecture, one hour's recitation. *Prerequisite: ECE 50B.* (S) Mr. Lugannani

52AL. Elementary Measurements Laboratory I (2)

The use of the oscilloscope, function generator, digital multimeter. Components and their ratings. Frequency characteristics of measuring instruments. Measurements of capacity and inductance. The concepts of time and frequency domains. The RC filter. Emphasis is placed on report writing. *Prerequisite: Phys. 2B or equivalent.* (F) Mr. Rotenberg

52BL. Elementary Measurements Laboratory II (2)

The LC filter. The idea of universal frequency characteristics. The Q factor. Band-pass RC filters, RLC filters and notch filters. Filter design. *Prerequisite: ECE 52AL.* (W) Mr. Rotenberg

52CL. Elementary Measurements Laboratory III (2)

Operational amplifiers. Diode and zener-diode characteristics. Wave shaping non-linear circuits. Rectification. Power supply specifications and characteristics. Power supply design. Regulation. *Prerequisite: ECE 52AL and 52BL.* (S) Mr. 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' lecture. *Prerequisite: none.* (FS) Ms. Lin and Mr. Fellman

ELECTRICAL AND COMPUTER ENGINEERING

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

105A. Introduction to Mathematical Physics I (4)

Functions of a complex variable with applications to Laplace transforms, conformal mapping, two-dimensional electrostatic and flow problems. Review of ordinary differential equations, series solutions. *Prerequisites: Math. 2DA, 2EA, 2F and ECE 50C, Phys. 2A-B-C or equivalent.* (F) Mr. Lewak

105B. Introduction to Mathematical Physics II (4)

Special functions, eigenfunction problems. Fourier series, review of vectors, grad, div, curl, multidimensional integrals, Green's and Stokes's theorems, curvilinear coordinates, maxima, minima, calculus of variations, partial differential equations. *Prerequisite: ECE 105A.* (W) Mr. Lewak

105C. Introduction to Mathematical Physics III (4)

Applications of material from ECE 105A and B, such as solutions of the wave, heat flow, and Poisson equations, Green's function methods. *Prerequisite: ECE 105B.* (S) Mr. Lewak

106. Numerical Methods in Electrical Engineering (4)

Introduction to applied numerical methods for solution of electrical engineering problems. Iterative solution of nonlinear circuit equations; matrix methods and the solution of multiloop linear circuit equations; filtering, smoothing, spline fits and interpolation of laboratory data; numerical differentiation and integration. Three hours' lecture, one hour recitation, three hours' lab. *Prerequisites: CSE 62A or equivalent. ECE 50A or equivalent and knowledge of Fortran 77 recommended.* (F) Mr. Quest

131A. Electromagnetism (4)

Review of Maxwell's equations in free space: integral and differential forms. Quasistatic approximations: electrostatics and magnetostatics. Electromagnetics of circuits. Transmission lines: reflection and transmission at discontinuities, matching problems, non-ideal lines, dispersion, group velocity. Three hours' lecture, one hour recitation, one hour lab. *Prerequisites: Math. 2F, Phys. 2C or 3C. ECE 105A-B recommended.* (F) Mr. Coles

131B. Electromagnetism (4)

Plane wave propagation and reflection at interfaces. Power flow in electromagnetic fields, Poynting's theorem. Boundary value problems. Guided waves: TEM, TE and TM modes, systems with cylindrical boundaries. Resonant cavities. Radiating systems: electric dipoles, magnetic dipoles, Huygen's principle, reciprocity. Arrays of elements. Antenna gain and effective area. Transmitting-receiving systems. Three hours' lecture, one hour recitation, one hour lab. *Prerequisite: ECE 131A.* (W) Mr. Coles

131C. Electromagnetism (4)

Antenna field calculations, self and mutual impedances. Induced EMF and moment calculations, numerical methods. Electromagnetic properties of materials: linear isotropic materials, nonlinear isotropic materials, anisotropic materials. The Lorentz transformation, fields in moving materials. Three hours' lecture, one hour recitation, one hour lab. *Prerequisite: ECE 131B.* (S) Mr. Coles

132. Analog Electronic Circuits (4)

Feedback systems, applications to operational amplifiers, sensitivity, gain bandwidth, limits, stability, compensation; design of simple active filters. Circuit models for bipolar junction and field effect transistors. Analysis and design of small-and large-signal transistor stages appropriate for integrated circuits. Three hours' lecture, three hours' laboratory. *Prerequisites: ECE*

50A-B-C, and 52AL-BL-CL. ECE 105A and 152A recommended. (F,W,S) Mr. Meiners

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' 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)

This course is designed to provide a general background of electronic materials science. Emphasis will be placed 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 conduction of materials. The goal is to understand the materials sciences aspect of I.C. and why they work. Three hours' lecture. *Prerequisite: Phys. 2C and 2D.* (S) Mr. Chang

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' lecture. *Prerequisites: Phys. 2D or 3D and ECE 105A concurrently.* (F) Mr. 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' lecture. *Prerequisite: ECE 135A.* (W) Staff

136A. Fundamentals of Semiconductor Device Fabrication (4)

Crystal growth, controlled diffusion, determination of junction-depth and impurity profile, epitaxy, oxidation, and photolithography techniques, monolithic process. Three hours' lecture. *Prerequisites: ECE 135A-B or equivalent.* (F) Mr. Chang or Mr. 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, 136A recommended.* (F,W,S) Mr. Chang or Mr. Lau

137. Materials Laboratory (4)

A laboratory course covering experimental concepts and approaches in the study of materials, including preparation, processing, alloying, crystal growing, physical metallurgy, and various techniques in the evaluation and characterization of materials. Four to six hours' laboratory. *Prerequisite: some background in solid-state physics or consent of instructor.* (S) Mr. Luo

138. Digital Circuits Design (4)

Introduction to designing digital electronic systems. Topics covered include logic gates, combinational and sequential logic circuits, memory, programmable array logic, and data processing system organization. Students will practice design of digital circuits in lab. Three hours' lecture, six hours' lab. *Prerequisites: ECE 50A-B-C and 52AL-BL-CL. ECE 132 recommended.* (Students who have taken CSE 175B may not take ECE 138 for credit.) (S) Mr. Guest

140D. Introduction to Quantum Electronics (4)

Introduction to quantum electronics, based on elementary quantum mechanics. Application to laser medium, periodic me-

dium, and photodetection. Incoherent light sources, laser systems, radiometry. Three hours' lecture. *Prerequisites: Math. 2DA, Phys. 2C and 2D.* (F) Mr. Yu and Mr. Chang

140E. 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' lecture. *Prerequisites: ECE 140D. Concurrent registration in ECE 105 recommended.* (W) Mr. Lee

140F. 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' lecture. *Prerequisites: ECE 140D and ECE 140E. Concurrent registration in ECE 105 recommended.* (S) Mr. Guest

141A. Lasers and Holography (4)

Lensless holograms, multiple beam holograms, bleached holograms, computer-generated binary holograms, color holograms. Laser principles. Solid-state laser, liquid (or dye) lasers, gas lasers. Laser resonator designs. Laser parameter measurements. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 140D-E-F.* (F) Mr. Yu or Mr. Guest

141B. Optical Signal Processing (4)

Optical transformation with various lens systems. Design of a Fourier spectrum analyzer. Imaging and information processing with coherent and incoherent illuminations. Partial coherence, impulse response, and transfer function concepts. Optical spatial filtering and spatial filter synthesis. Production of optical components such as a lens or a spherical mirror. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 140D-E-F.* (W) Mr. Lee or Mr. Guest

141C. Optical Electronics and Communications (4)

Principles and performance characteristics of important devices and components in optical electronics and communication systems, which include light sources (laser diodes and light emitting diodes), modulators (electro-optic and acousto-optic), waveguides or transmission media for light (fibers and integrated optical guides), and optical detectors. Engineering design considerations for optical electronic circuits and optical communication systems. Two hours' lecture, six hours' laboratory. *Prerequisites: ECE 140D-E-F.* (S) Mr. Guest or Mr. Yu

142AL-BL-CL. Acoustics Laboratory (4-4-4)

Automated laboratory based on H-P GPIB controlled instruments. Software control data collection and analysis. Vibrations and waves in strings and bars of electromechanical systems and transducers. Transmission, reflection, and scatterings of sound waves in air and water. Aural and visual detection. Four hours' laboratory, two hours' lecture. *Prerequisite: concurrent registration in ECE 131A-B-C or consent of instructor.* (F,W,S) Mr. Anderson

143. Fundamentals of Magnetic Recording (4)

Basic theoretical concepts in magnetic recording, including magnetic measurement techniques, magnetic materials for heads, structure and function of heads, reproduction process, noise, audio and instrumentation readers, video recorders, and digital recording. Three hours' lecture. *Prerequisites: ECE 50C and ECE 131A.* (S) Mr. Mallinson

144. Magnetic Recording Laboratory (4)

Measurements and analysis of frequency dependence of recording head permeability, inductance and efficiency. Field plotting and Fourier transforms of head fields. Recording spectra and pulse measurements and media characterization using current recording systems. One hour's lecture, seven hours' laboratory. *Prerequisite: ECE 143 and undergraduate laboratory course such as ECE 146A-B or Physics 120A.* (S) Mr. Bertram

146A. Analog Systems and Circuits (4)

Design of analog integrated circuits: operational amplifiers, voltage regulators, and phase-locked loops. Use of feedback at circuit and system levels. Effect of circuit design on noise performance. Circuit designs will be tested in the laboratory and simulated by computer. Three hours' lecture, three hours' laboratory. *Prerequisites:* ECE 105A, 152A, 132. ECE 135A-B and 152B-C recommended. (F) Mr. Coles

146B. Digital Electronic Circuits and Systems (4)

Application of MOS field effect transistors and bipolar transistor to digital circuits. Design of digital system building blocks including standard logic families, flip-flops, programmable logic arrays, shift registers, static and dynamic random access memories, digital-analog and analog-digital converters and computer and microprocessor circuits. *Prerequisite:* ECE 132. CSE 175B recommended. (W) Mr. Coles

146C. 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 tested in the laboratory and simulated by computer. Three hours' lecture, three hours' laboratory. *Prerequisites:* ECE 105A-B-C, ECE 131A and ECE 132. ECE 131B-C, 146A and 135A-B recommended. (S) Mr. Rickett

147. Data Acquisition and Process Control (4)

Concepts and techniques necessary for using mini- and micro-computer systems to gather data and control equipment are taught. Peripheral equipment bus standards are included. Information concerning equipment commonly interfaced to computers such as video systems and servo mechanisms is provided. Laboratory will give students hands-on experience with lecture topics. Three hours' lecture, four hours' lab. *Prerequisites:* ECE 138 and CSE 170A. ECE 132 is recommended. (F) Mr. Guest

149. Semiconductor Device Modeling and Design (4)

An investigation of semiconductor device modeling based on first-principles physical models. Limitation of IC design based on physical constraints and processing technology. Study of integration possibilities using state of the art processing technology. Three hours' lecture. *Prerequisites:* ECE 132 and ECE 135A-B. (S) Mr. Meiners

150A. Electronic Signal Processing (4)

Design of linear filters for time series and sequences. Analog active filters for both continuous and discrete time. Digital filter algorithms and implementation in hardware. Introduction to adaptive filters. Filter designs will be tested in the laboratory and simulated by computer. Three hours' lecture, three hours' laboratory. *Prerequisites:* ECE 132, ECE 138 or CSE 175B, and ECE 152A. ECE 146B and 152B-C recommended. (W,S) Mr. Coles

150B. Electronic Signal Processing II (4)

Selected electronic signal processing topics. Adaptive signal processing. Analysis of fast transform algorithms. Design of electronic Digital Signal Processing (DSP) systems. Evaluate DSP architectures and implementations. Algorithms and architectures simulated on computer-aided design work stations. Three hours' lecture, three hours' laboratory. *Prerequisites:* ECE 150A and ECE 152A. (S) Mr. Chau

152A. Signal Analysis (4)

Fourier series and transform, sampling representation of linear systems and filters, feedback control, digital filters, and z-transforms. *Prerequisites:* ECE 50C, Math. 2DA-2EA-2F, and ECE 105A concurrently. (F) Mr. Helstrom

152B-C. Signal Analysis (4-4)

Random variables, probability distributions, expected values, transformation of random variables. Stochastic processes, correlation functions, spectral densities, the Gaussian process,

random noise in linear systems. *Prerequisite:* ECE 152A or ECE 105A or consent of instructor. (W,S) Mr. Helstrom

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-C. (F) Mr. 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. (W) Mr. 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. (S) Mr. Milstein

154AL. Communications Systems Laboratory (2)

This course will be concerned with modulation and coding techniques for digital recording channels. Two hours' seminar. *Prerequisite:* concurrent registration in ECE 154A. (F) Mr. Wolf

154BL. CL. Communications Systems Laboratory (4)

This course will be concerned with modulation and coding techniques for digital recording channels. In the winter and spring quarters students will perform experiments and/or compiler simulations. One hour lecture, four hours' laboratory. *Prerequisite:* concurrent registration in ECE 154B and C required. (W,S) Mr. Wolf

159A. Queuing Systems (4)

Analysis of single- and multi-server queuing systems; queue size and waiting times. Modeling of telephone systems, interactive computer systems and the machine repair problems. Three hours' lecture. *Prerequisite:* ECE 152B or Math. 180A. (F) Mr. Masry

159B. Queuing Systems (4)

Queues in tandem. Priority scheduling, computer systems application; time-sharing scheduling, modeling and performance of interactive multi-programmed computer systems. Three hours' lecture. *Prerequisite:* ECE 159A. (W) Mr. 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' lecture. *Prerequisite:* ECE 159B. (S) Mr. Masry

159D. Data Networks (4)

An introductory-level course in performance analysis and design of multi-user, packet-switched communication systems. Topics include: layered network architectures and standards, data link control protocols and multiple access communication, queueing delay models for data networks, routing, flow control, packet radio networks, interconnection networks. Three hours' lecture. *Prerequisites:* ECE 152B-C and ECE 159A. (S) Mr. Cruz and Mr. Rao

161A. Linear Control System Theory (4)

Classical analysis and design of continuous linear feedback control systems, emphasizing Laplace transform and frequency-domain methods. Stability by root locus, Bode, Nyquist, and Nichols plots. Transient and steady-state behavior. Error constants. Lead, lags, and proportional-plus-integral-plus

derivative compensators. Four hours' lecture. *Prerequisite:* grade of C or better in AMES 163B. (F) Mr. Schneider

161B. Linear Control System Theory (4)

Extension of ECE 161A. Time-domain, state-variable formulation of the control problem. Feeding back the state variables to gain control of close-loop poles. The state-transition matrix. The z-transform, its application to analysis of systems using digital computers as real-time controllers. Design of digital control algorithms. Four hours' lecture. *Prerequisite:* grade of C or better in ECE 161A. (W) Mr. Schneider

161C. Problems in System Design (4)

Translation of task requirements into practical system models. Consideration of such problems as stability of continuous and digitally controlled systems, word-length and sampling-rate of digital controllers, accuracy, disturbance rejection, and complexity of implementation. Application of these concepts to a project of current interest in engineering practice. Four hours' lecture. *Prerequisite:* grade of C or better in ECE 161B. (S) Mr. Schneider

162A-B-C. Introduction to Optimization and Applications (4-4-4)

Unconstrained optimization. Constrained and discrete optimization. Linear or nonlinear programming. Kuhn-Tucker conditions. 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. Four hours' lecture. *Prerequisites:* admission to the major and grade of C or better in Math. 2EA and 130A. Enrollment in ECE 162B or C requires grades of C or better in ECE 162A or B. (F,W,S) Mr. Sworder

163A. Microprocessor 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 of two 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 given to systems science majors. One hour lecture. *Prerequisites:* grade of C or better in AMES 170, ECE 161A, and concurrent registration in ECE 161B or consent of the instructor.

163B. Microprocessor Control Laboratory (4)

Design development course. Students who have completed ECE 163A redesign their projects to make them meet tighter specifications. Students work closely with systems faculty to identify flaws in their design and eliminate them. Extensive computer design evaluations are required. More complex control systems typically evolve to increase the accuracy, speed, and robustness of the designs. Three hours' laboratory. *Prerequisite:* grade of C or better in ECE 163A. (S) Mr. D.V.B. Rao

180. Concurrency and Real-Time Systems (4)

The course conveys the fundamental notions of timing, synchronization, and concurrency in both the hardware and software domains of digital systems design. These notions are developed through the study and implementation of real-time systems. Topics include real-time interrupt driven systems; concurrency and statement-level parallelism in digital systems; synchronous, asynchronous and self-timed systems; hardware and software synchronization mechanisms; and concurrent programming languages and concepts. Two hours' lecture, four hours' laboratory. *Prerequisite:* CSE 170B or equivalent. (F) Ms. Lin and Mr. Fellman

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' lecture. *Prerequisite:* consent of the department chairman.

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

210A. Physics of Magnetic Recording (4)

This course covers physical behavior of magnetic materials utilized as recording media and heads. Basic magnetic phenomena such as fields, ferromagnetism, demagnetization and domains will be examined, as well as phenomena particular to recording applications, e.g., coercivity and relation mechanisms. *Prerequisites: ECE-131A-B-C, 152A-B-C, or consent of instructor.* (F) Mr. Bertram

210B. Analysis of the Magnetic Recording Process (4)

In depth discussion of the magnetic recording process. Fields from recording heads will be reviewed and the linear reproduce process will be analyzed. The nonlinear record process and media noise mechanism will be discussed and signal-to-noise ratios calculated. *Prerequisites: ECE 131A-B-C, 152A-B-C, or consent of instructor.* (W) Mr. Bertram

210C. Magnetic Recording Laboratory (4)

Purpose is for students to gain experience in most of the basic measurements in magnetic recording. Fundamental properties of heads and media will be measured and analyzed. Recording process will be examined by pulse and spectral measurements on recording systems. *Prerequisites: ECE 132 or 146A, or consent of instructor.* (S) Mr. Bertram

220A. Solid State Electronics (4)

This course is designed to provide a general background in solid state electronic materials and devices. Course content emphasizes the fundamental and current issues of semiconductor physics related to the ECE solid state electronics sequences. *Prerequisites: fundamentals of quantum mechanics, ECE 135A-B or equivalent.* (F) Mr. Lau

220B. 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. *Prerequisite: ECE 220A.* (W) Mr. Meiners

220C. Solid State Electronics (4)

This course is designed to provide a treatise of semiconductor devices based on solid state phenomena. Band structures, carrier scattering, and recombination processes and their influence on transport properties will be emphasized. *Prerequisite: ECE 220A or equivalent.* (S) Mr. Yu

Note: Course numbers ECE 220D, E, F, G, H, and I cannot be used as a substitute for ECE 220C as a core course.

220D. Characterization of Electronic Devices (4)

Characterization of the electrical and galvanomagnetic properties of semiconductors relevant to the technology of transistors and integrated circuits. *Prerequisite: consent of instructor.* (S) Mr. Wieder

220E. 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. *Prerequisite: consent of instructor.* Mr. Luo

220G. Introduction to Magnetism (4)

Fundamental concepts and experimental methods in magnetism, intrinsic magnetic properties and magnetization processes such as exchange mechanism, magnetic anisotropy domain wall structures, etc., magnetic materials and thin applications. *Prerequisite: consent of instructor.* (S) Mr. Luo

220H. Dielectric Materials (4)

Polarization, dipole interaction, Lorentz field, Clausius-Mossotti relation, dielectric response dispersion and relaxation, Kramers-Kronig relations, fundamentals and applications of ferroelectric and related materials. *Prerequisite: consent of instructor.* Mr. Luo

221. 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. (W) Mr. Lau and Mr. Luo

222. The Field Effect and Field Effect Transistors (4)

Physics of the field effect of elemental and III-V compound semiconductors related to the technology and characteristics of Schottky barrier gate, insulated gate and junction gate field effect transistors. *Prerequisite: consent of instructor.* (S) Mr. Wieder

224. Introduction to VLSI Microfabrication Technology (4)

(Very Large-Scale Integration). Analysis and experimental results of VLSI microfabrication processes such as lithography, dry etching processes, shallow junction formation by implantation and annealing, and yield modeling will be presented in the lectures, plus discussions of the lecture materials and current literature in recitation sessions. Written report and verbal presentation of term projects on specialized topics will be made by each student. *Prerequisite: ECE 135B, ECE 136A or 136B or microfabrication experience.* (S) Mr. Chang

226A. III-V Compound Semiconductor Material (4)

This course covers the basic bulk and heterojunction properties of III-V compound semiconductors, for the subsequent courses on electronic and photonic device applications. Epitaxial growth techniques, quantum wells and superlattices, and some material characterization techniques will also be covered. *Prerequisite: consent of instructor.* (F) Mr. Tu

226B. 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. *Prerequisite: ECE 220A, C or equivalent.* (W) Mr. Yu

226C. Heterojunction 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, charges transport normal and parallel to such interfaces two-dimensional electron gas structures, modulation doping, heterojunction and insulated gate field effect transistors. *Prerequisite: consent of instructor.* (S) Mr. Wieder

230A. VLSI Digital System Design: Fundamentals I CAD Tools (4)

Custom and semicustom VLSI design from the system designer perspective; fundamentals of VLSI system architectures; design methodologies and computer-aided design (CAD) tools will be emphasized. Knowledge of basic semiconductor elec-

tronics and digital design is assumed. Device and circuit fundamentals of MOS-transistors as related to VLSI logic for IC chip design project of ECE 230A-B-C sequence. *Prerequisite: ECE 146B, consent of instructor.* (F) Mr. Chau

230B. 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-three students per team. Layout done on CAD workstations for project IC chip fabrication. Design projects will be reviewed in class presentation. *Prerequisite: ECE 230A.* (W) Mr. Chau

230C. 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. Mr. Chau

232A-B-C. Applied Electromagnetic Theory (4-4-4)

Electrostatics and dielectric materials. Uniqueness, reciprocity, and Poynting theorems. Solutions to Maxwell's equations in rectangular, cylindrical, and spherical coordinates. Waves in isotropic and anisotropic media, transmission lines, waveguides, optical fibers, and resonant structures. Radiation, propagation and scattering problems. Scattering matrices, microwave circuits and antennas. Mr. Rickett

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) Mr. Arrhenius

241A. Lasers and Optics (4)

Fresnel and Fraunhofer Diffraction Theory. Optical resonators, interferometry. Gaussian beam propagation and transformation. Laser oscillation and amplification, Q-switching and mode locking of lasers, some specific laser systems. *Prerequisites: ECE 131A-B or equivalent; introductory quantum mechanics.* (F) Mr. Chang or Mr. Lee

241B. Optical Information Processing (4)

Space bandwidth product, superresolution, space-variant optical system, partial coherence, image processing with coherent and incoherent light, processing with feedback, real-time light modulators for hybrid processing, nonlinear processing. Optical computing and other applications. *Prerequisites: ECE 131A-B or equivalent.* (W) Mr. Guest or Mr. Lee

241C. Optical Modulation and Detection (4)

Propagation of waves and rays in anisotropic media. Electro-optical switching and modulation. Acousto-optical deflection and modulation. Detection theory. Heterodyne detection, incoherent and coherent detection. *Prerequisites: ECE 131A-B or equivalent.* (S) Mr. Lee or Mr. Yu

241E. Optical Fiber Communication (4)

Optical fibers, waveguides, laser communication system. Modulation and demodulation; detection processes and communication receivers. *Prerequisites: ECE 131A-B or equivalent; introduction to communication.* (S) Mr. Chang or Mr. Yu

241F. Nonlinear Optics (4)

Second harmonic generation (color conversion), parametric amplification and oscillation, photorefractive effects and four-wave mixing, optical bistability; applications. *Prerequisites: ECE 241A, ECE 241C, or consent of instructor.* (F) Mr. Lee or Mr. Guest

241G. 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 techniques. (F) Mr. Esener

242A. 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 142AL recommended.* Mr. Anderson

242B. Advanced Acoustics II (4)

Theory of radiation, transmission and scattering of sound with special application to ocean acoustics. *Prerequisites: concurrent registration in 142BL recommended. ECE 242A or consent of instructor.* Mr. Anderson

242C. Advanced Acoustics III (4)

Signal processing in underwater acoustics. Theory and hardware embodiments. *Prerequisites: concurrent registration in 142CL recommended. ECE 242B or consent of instructor.* Mr. Anderson

243A-B. Optical Systems (4-4)

Fundamentals of optical systems which provide visual information, including photographic and electronic imagery. Geometrical, physical, and physiological optics; radiometry, photometry, colorimetry, atmospheric optics, visibility; coherence, spatial frequency, analysis, transfer functions, resolution, image evaluation, image reconstruction. Ultimate capabilities of optical systems. *Prerequisite: consent of instructor.* (W,S) Mr. Lee

246A-B. Wave Propagation through Random Media (4-4)

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. *Prerequisite: consent of instructor.* Mr. Rickett

249. 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. *Prerequisite: ECE 131A-B-C or consent of instructor.* (W) Mr. Mendis

250A. Random Processes (4)

Random variables, probability distributions and densities, characteristic functions. Convergence in probability and in quadratic mean. Stochastic processes, stationarity, second order processes, wide sense 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. *Prerequisites: ECE 152C or equivalent or consent of instructor.* (F) Mr. Lugannani

250B. Random Processes (4)

Convergence of sequences of distribution functions and characteristic functions, compact and weak convergence. Central limit theorem, Liapounov and Lindeberg-Levy 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) Mr. Lugannani

251A. 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: ECE 152A-B-C or equivalent.* (F) Mr. Hodgkiss

251B. Digital Signal Processing II (4)

Power spectrum estimation; homomorphic signal processing; applications to: speech, radar/sonar, picture, biomedical, and

geophysical data processing. *Prerequisites: ECE 251A or consent of instructor.* (W) Mr. Hodgkiss

251C. Digital Signal Processing III (4)

Signal and multi-channel data processing in a time-varying environment; adaptive filters; high-resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisite: ECE 251B or consent of instructor.* (S) Mr. Hodgkiss

253A. Digital Image Processing I (4)

Image representations, models, quantization and sampling, 2-D randomfields, image transforms, compression and coding, model-based restoration and filtering, edge detection, feature extraction, scene segmentation, reconstruction from projections. *Prerequisites: ECE 152A-B-C, recommended: ECE 251A.*

253B. Digital Image Processing II (4)

Fundamentals of computer vision; texture analysis and scene segmentation; extraction of shape from monocular and stereo illumination profiles; analysis of time-varying images, methods based on features and optical flows; understanding range images and structured light images. *Prerequisites: ECE 152A-B-C, ECE 253A.* (S) Mr. Chatterjee

254A-B-C. Detection Theory (4-4-4)

Hypothesis testing; detection of signals in white and colored Gaussian noise; Karhunen-Loeve 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) Mr. Helstrom

256A-B. Time Series Analysis and Applications (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) Mr. Masry

257A. Multi-User 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 152B, C or equivalent, ECE 159A.* Note: ECE 159A is an integral part of this course and should be taken in the fall quarter. (W) Mr. Rao

257B. Multi-User 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) Mr. 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. *Prerequisite: ECE 154A-B-C and ECE 254A or consent of instructor.* (W,S) Mr. Milstein

259A. Information Theory (4)

Introduction to basic concepts, source coding theorems, capacity, noisy-channel coding theorem. *Prerequisite: ECE 154A-B-C or consent of instructor.* (F) Mr. 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) Mr. 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. *Prerequisite: ECE 154A-B-C or consent of instructor.* (S) Mr. Viterbi

260A. Linear Systems (4)

Linear spaces and operators, matrix algebra system of linear algebraic equations, contractions mapping, solution of linear systems, condition numbers, QR factorization (Cholesky decomposition), singular value decomposition (SVD), description of systems using state variables, state transition matrices, introduction to controllability, observability, realizability issues. *Prerequisite: Math 2EA or consent of instructor.* Mr. Chatterjee

260B. Linear Systems (4)

Controllability and observability of linear equations, partial realization (realizations using reduced forms), state feedback and estimation, stability of linear systems using state variable approach, pole placement problems, large systems issues. *Prerequisite: ECE 260A or consent of instructor.* (W) Mr. Chatterjee

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 system designs. *Prerequisite: consent of instructor.* (F) Ms. 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. *Prerequisites: ECE 263A-B or consent of instructor.* (W) Ms. 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) Ms. Lin

266. 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. *Prerequisite: consent of instructor.* (W) Ms. Kavanagh, Mr. Vecchio, and Mr. Rudee (Multiple listing with AMES 245.)

270A-B-C. Neurocomputing (4)

Neurocomputing is the study of non-algorithmic 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) Mr. Hecht-Neilsen

271A-B-C. Linear and Nonlinear Systems (4-4-4)

Linear spaces, equilibrium equations, linearization, contraction maps, state transition matrix, stability theory, controllability, observability and realizability, pole placement, observers, sensitivity analysis, singularly perturbed systems, nonlinear differential equations. Liapunov and Popov stability, describing functions, Krylov-Bogoliubov asymptotic method. *Prerequisites: ECE 161A-B-C.* (F,W,S) Mr. Rao

272A-B-C. Stochastic Processes in Dynamic Systems (4-4-4)

Second-order stochastic processes, stochastic integrals and stochastic differential equations, diffusion equations, linear and nonlinear estimation and detection, random fields, optimization of stochastic dynamic systems, applications of stochastic optimization to problems. *Prerequisites: ECE 161A-B-C. (F,W,S) Mr. Rao*

273A-B-C. Optimal Control Theory (4-4-4)

Linear vector spaces, Hilbert spaces, minimum norm problems, dual spaces, optimization of functionals, global and local theories; linear optimal control, controllability, sets of attainability, time-optimal control, integral cost criteria; Pontryagin maximum principle, singular control; game theory, matrix difference, differential games, pursuit-evasion, homicidal chauffeur. *Prerequisites: ECE 162A-B-C. (F,W,S) Mr. Rao*

274A-B-C. Estimation and System Identification (4-4-4)

Parameter estimation, least-squares, bias consistency, efficiency, mean-square and maximum likelihood estimators, numerical solutions for estimates; estimators for linear dynamic systems. Wiener filter and Wiener-Hopf equation, Kalman filter, Riccati equation, filter stability, smoothing, extended Kalman filter, divergence and divergence control, system identification methods, ARMA and transfer function identification, input signal synthesis. Akaike's criterion. *Prerequisites: ECE 162A-B-C. (F,W,S) Mr. Rao*

287A-B-C. Special Studies in Information Science (1-4)

Topics of special interest in information science to be presented by staff members and graduate students under faculty direction. Subject matter to be announced before each quarter. One to three hours' lecture. *Prerequisite: consent of instructor.*

288. Special Topics in Applied Physics (1-6)

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.*

289. Special Topics in Information Science (1-8)

A course to be given at the discretion of the faculty at which topics of current interest in information theory or signal processing will be presented by visiting or resident faculty members. (S/U grades optional.) *Prerequisite: consent of instructor.*

290. Observatory Field Course (1-12)

Methods of measurement, observation and data processing used at radio, radar, and optical observatories in astronomy and solar system physics; establishment and use of equipment for a current research investigation at an observatory; analysis and interpretation of result with a report. *Prerequisite: consent of instructor.*

291. Graduate Seminar in Applied Physics (2-2-2)

Weekly discussion of current research literature. Staff

292. Graduate Seminar in Solar System and Space Physics (2-2-2)

Research topics in radio astronomy and solar system physics. (S/U grades only.) Mr. Rickett

293. Graduate Seminar in Information and Computer Science (2)

Research topics in information and computer science. Staff

294. Graduate Seminar in Applied Solid State Physics (2)

Research topics in applied solid state physics and quantum electronics. Mr. Luo

296. Graduate Seminar in Optical Signal Processing (2)

Research topics of current interest in holography. Mr. 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 (1-6)

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 chairman.*

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)

FIFTH SEMINAR

OFFICE: Fifth College Writing Program, Building 412, Matthews Administrative and Academic Complex

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)

ENGLISH AND AMERICAN LITERATURE

See Literature.

FIFTH COLLEGE

OFFICE: Provost, Fifth College, Building 412, Matthews Administrative and Academic Complex

THE MAKING OF THE MODERN WORLD/WRITING PROGRAM

OFFICE: Fifth College Writing Program, Building 412, Matthews Administrative and Academic Complex

See "The Making of the Modern World" program for Fifth Writing.

FIFTH COLLEGE FRESHMAN HONORS PROGRAM

OFFICE: Provost, Fifth College, Building 412, Matthews Administrative and Academic Complex

The Fifth College Freshman 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 scholars students an opportunity for direct, informal interactions with faculty.

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 1, 2, and 4, 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)

128. Frontiers of Biophysics (4)

An introduction to frontier problems in biophysics and current approaches to their solution. Emphasis will be placed on the fundamental physical principles which govern the variety of complex living processes ranging from the molecular and cellular phenomena to the animal and human systems. *Prerequisite: Revelle lower-division science requirement or equivalent.* (Not offered in 1990-91.)

143. Size, Scale, and Structure (4)

An exploration of morphology—from regular polygons to minimal surface to fractals—and a study of growth processes that produce patterns and structures. Applications to biology, physics, chemistry, art computer science, engineering, architecture, etc. Many ideas from mathematics and the physical sciences are introduced, but the treatment is kept elementary (e.g., calculus is not used). Much of the course is motivated by D'Arcy Thompson's classic treatise *On Growth and Form* and its progeny. *Prerequisite: background in algebra and trigonometry.* (Not offered in 1990-91.)

GREEK LITERATURE

See Literature.

HEALTH CARE—SOCIAL ISSUES

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Warren Campus

Health care—social issues is an interdisciplinary minor designed to enhance students' competence in analyzing complex social and ethical implications and ramifications of health care issues, policies, and delivery systems. Students gain an understanding of how the economy, culture, technology, sociological, and psychological processes influence modern health care. Although it is administered by Warren College, it is available to all UCSD students with a general interest in health care as well as to students considering health care careers. This minor offers UCSD students the opportunity to examine health care-related issues from the perspectives of a wide range of disciplines including: anthropology, economics, philosophy, psychology, sociology, urban studies, and science and technology. By bringing together course work from these academic departments, this interdisciplinary curriculum offers a breadth of intellectual experience that enhances students' undergraduate education and their preparation for professional and 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 Campus.

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-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

Sociology 40, Sociology of Health Care Issues, and
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

10—Introduction to Physical Anthropology
22—Introduction to Cultural Anthropology
128—Anthropology of Medicine
155—Models of Madness
191—Seminar in Medical Anthropology

Economics

1A, 1B—Elements of Economics
138—Economics of Health

Philosophy

124—Contemporary Moral Issues

HISTORY

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- 127—Professional Ethics
- 185—Special Topics (prior approval of topic required)

Psychology

- 1—Psychology
- 2—General Psychology: Biological Foundations
- 60—Introduction to Statistics
- 104—Introduction to Social Psychology
- 139—Brain Damage and the Mind
- 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

- 105C—Technology and Society
- 181—Elements of International Medicine

Sociology

- 1A, 1B—The Study of Society
- 135—Sociology of Health and Illness
- 136A—Sociology of Mental Illness: Historical
- 136B—Sociology of Mental Illness: Contemporary
- 137—Alcohol and Society
- 143—Suicide

Urban Studies and Planning

- 143—Orientation to Health Care Organizations
- 144—Preventive Health Care
- 145—Aging: Social and Health Policy Issues
- 146—Case Studies in Health Care Programs: Children and Families
- 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 Campus. 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

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See Literature.

HISTORY

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OFFICE: Room 5024, Humanities and Social Sciences Bldg., Muir College

Professors

- Stanley Chodorow, Ph.D., *Dean of Arts and Humanities*
- John Dower, Ph.D., *Endowed Chair, Japanese 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.
- Allan Mitchell, Ph.D.
- Alden Mosshammer, Ph.D., *Chairman*
- Michael E. Parrish, Ph.D.
- Paul G. Pickowicz, Ph.D.
- Edward Reynolds, Ph.D.
- David R. Ringrose, Ph.D.
- Robert C. Ritchie, Ph.D.
- Martin J. S. Rudwick, Ph.D.
- Ramón E. Ruiz, Ph.D.
- Eric Van Young, Ph.D.
- Robert S. Westman, Ph.D.

Associate Professors

- Michael A. Bernstein, Ph.D.
- Robert S. Edelman, Ph.D.
- Robert Marc Friedman, Ph.D.
- Rachel Klein, Ph.D.
- David S. Luft, Ph.D.
- John A. Marino, Ph.D.
- Michael P. Monteón, Ph.D.

Assistant Professors

- William F. Deverell, Ph.D.
- David G. Gutierrez, Ph.D.
- Stephanie McCurry, Ph.D.
- Michael Meranze, Ph.D.
- William H. Propp, Ph.D.
- Pamela B. Radcliff, Ph.D.
- Julie Saville, Ph.D.
- Cynthia Truant, Ph.D.

Lecturer with Security of Employment

Ping Hu

Adjunct Professors

- Paul Drake, Ph.D.
- Peter Smith, Ph.D.
- Leften Stavrianos, Ph.D.

Emeriti Professors

- Guillermo Cespedes, Ph.D.
- John S. Galbraith, Ph.D.
- H. Stuart Hughes, Ph.D.
- Gabriel Jackson, Ph.D.
- Earl Pomeroy, 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, Professor Michael Bernstein, phone 534-1070.

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.

Lower-division sequences may be selected from the following:

- HILD 1 A-B-C Latin America
- HILD 2 A-B-C United States History
- HILD 3 A-B-C European Society and Social Thought
- HILD 4 A-B-C History of Developing Nations (cross-listed with Third World Studies 24-25-26)
- HILD 6 A-B-C Introduction to the History of Science
- HILD 7 A-B-C Race and Ethnicity in the U.S.A. (cross-listed with Third World Studies 7A-B-C)

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 April 15.

The honors program consists, in addition to regular course work in the department, of a colloquium in historiography offered in the fall quarter of the senior year and a program of independent study leading to the completion of an honors essay on a topic of the student's choice. During the fall quarter of the senior year candidates select a topic and begin preliminary work on the honors essay in consultation with a major field adviser (HITO 194). During the winter quarter the student pursues a course of independent study devoted to the completion of the honors

essay (HITO 195). The award of history honors is based on satisfactory completion of the colloquium in history and the honors essay. Students are expected to maintain an average of 3.5 or better in all work taken within the department. Honors candidates must include at least three colloquia in their regular course work.

Candidates for history honors should organize their work as follows:

1. Six quarter-courses in one of the major fields offered by the department, of which two or three should be colloquia;
2. Three quarter-courses in a field other than the primary one, of which one course should be a colloquium unless the requirement of three colloquia has been satisfied in the major field;
3. HITO 196. Colloquium in History;
4. HITO 194 and 195. History Honors—Honors Essay.

MINORS IN HISTORY

The minor consists of at least six courses, of which no more than three may be lower-division. Although there is no specific distribution requirement, the courses should be selected to constitute a coherent curriculum. Prospective minors in history should consult with a departmental adviser for approval of their program.

EDUCATION AT HOME PROGRAM (EHP)

In the winter quarter 1991, 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 modern European history (1500 to the present), 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 medieval Europe, Africa, China, history of science, and Judaic studies. (See details below.) Applicants must submit their academic records, three letters of recommendation, Graduate Record Examination scores (aptitude only), and one or two papers written for history courses. Ordinarily, those admitted have at least a 3.0 grade-point average, with a higher average in history and related subjects. Students wishing information regarding the possibility of part-time M.A. study should consult the department's graduate coordinator. 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 and seminars. 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, Latin American history, and certain special areas must demonstrate reading knowledge of at least one foreign language relevant to their course work.

AREA OF CONCENTRATION: EUROPE

Candidates for the M.A. degree in European history pursue a program concentrating on the impact of industrialization on European society. In addition to general training in the history of modern Europe, the program provides background in earlier European history in order to place industrialization 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. HIGR 208A-B-C. Central Problems of European History: 1500-1945. All entering graduate students in European history take these courses.
2. Two courses in pre-industrial Europe.
3. Two courses in industrial Europe.
4. A Graduate Research Seminar.
5. One course in a discipline other than history, if relevant to the student's program.

**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 history. 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 247A-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, 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 250A-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—economic, social (including urban) history, history of the South, legal and constitutional history, or cultural history.
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 250 series to meet this requirement.

SPECIAL M.A. PROGRAM

Students who wish to work in specific areas, such as medieval Europe, Africa, China, history of science, Judaic studies, or other areas, can develop an M.A. program in conjunction with an

appropriate faculty member and petition the department for approval.

Students interested in pursuing graduate work leading to the M.A. degree in history with specialization in China may, with the approval of the department, include in their programs courses offered in the Departments of Anthropology, Literature, Linguistics, Political Science, and Sociology, as well as History.

PH.D. PROGRAM

ADMISSION

The Department of History offers the doctor of philosophy degree in the fields of European history, Latin American history, United States history, and history of science. In addition, a new program in ancient history will be offered, effective September 1990 (see "Ancient History").

Applicants for admission to these programs must submit their academic record, three letters of recommendation, Graduate Record Examination scores (aptitude only), TOEFL scores for foreign applicants, and one or two papers, preferably written for history courses. 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. EUROPEAN HISTORY

- A. Major Fields
 1. Modern Europe with a specialty in Britain, Spain, France, Germany, Italy, social history, economic history, diplomatic history, or intellectual history.

2. Early modern Europe with a specialty in expansion of Europe, one country, or socioeconomic history.
3. Medieval Europe with a specialty in political theory, canon law, or the political history of the eleventh-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. Britain
 6. Russia
- C. Second Minor
 1. A geographic area outside of Western Europe
 2. Expansion of Europe
 3. A related discipline

II. 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 Mexico, Cuba and Central America, the Andean region, 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 Mexico, Cuba, the Andean Republics or 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. Another geographic area, or
 2. An area of discipline related to the student's dissertation or preparation for university teaching.

III. UNITED STATES HISTORY

- A. Major Fields
 1. Colonial and National America, to 1877
 2. Modern America, 1877–present
- B. First Minor
 1. Either of the above fields not chosen as the major field, or
 2. One of the following topical fields: social and cultural history, economic history, legal and constitutional history, political history, history of the South, history of the borderlands and Southwest, Afro-American history, Chicano history; 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

IV. HISTORY 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.
- B. First Minor
 1. Any of the other fields offered by the department, provided that it offers general historical understanding of the same period as the major field.
 2. A field of history of science not chosen as the major field.
- C. Second Minor
 1. Sociology of science and philosophy of science.
 2. A field of history of science not chosen as the major field.
 3. A second field of history, provided that it concentrates on a period or region other than that chosen as the first minor.
 4. A related discipline, offered through another department.

V. ANCIENT HISTORY (Effective September, 1990)

- A. Major Fields

Students in ancient history will be expected to demonstrate a broad mastery of the entire field, with special concentration in one of the following areas:

 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.
 4. 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. An ancillary discipline outside the field of history.
 - 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 the 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, are available through the department and 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.

VI. 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 and Chinese history. When appropriate, students may select minor fields in these areas.

PH.D. AND M.A. LANGUAGE REQUIREMENTS

1. Ph.D. candidates in European and ancient history must demonstrate competence in two foreign languages. Ph.D. candidates in United States, Latin American history, or history of science and M.A. candidates in European or Latin American history must demonstrate competence 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 European, ancient, Latin American, United States history, or history of science will be set by the Graduate Committee, in consultation with the student's major-field adviser.
2. Students may satisfy the foreign language requirement in any 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 administered by the Educational Testing Service;
 - B. 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;
 - C. By completing with a grade of B — or better in each term a one-year, upper-division sequence in the language approved by the Graduate Committee;
 - D. For languages not covered by the GSFLT program, the requirement may be satisfied either by options B or C or by passing a special examination in the language which shall be administered by the Graduate Committee.
 - E. With reference to options B and C, such sequence must have been completed within two years of the time that request is made to the Graduate Committee for certification of competence. Courses may have been taken either at UCSD or, with the approval of the Graduate Committee, at another institution.
 - F. By passing a proficiency examination administered by the Department of Linguistics, with a minimum score to be established by the Graduate Committee.

Where required, students must pass at least one foreign language examination by the end of the first year of study. Failure to meet this requirement is grounds for dismissal from the program. Students may not take the first minor field examination before completing one language requirement. 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. A maximum of four units may be in apprentice teaching. Students are expected to complete the following minimum of formal courses prior to their examinations: two two-quarter research seminars, (three, in the case of Latin American history), and eight quarters of colloquia or directed reading. 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 inquire of the department about opportunities for part-time study.

Part-time students must satisfy the same admission requirements as full-time students and are eligible, at the discretion of the department, for 25 percent time teaching or research assistantships. Students who are approved by the dean of Graduate Studies and Research for enrollment in a program of half-time study or less (maximum of six units) may be eligible for a reduction in fees. All other students pay the same fees as full-time students.

APPRENTICE TEACHING AND RESEARCH

As preparation for an academic career, Ph.D. candidates in history are encouraged to serve as teaching assistants. In certain cases, a student may instead participate in some special research program.

EXAMINATIONS

Ph.D. candidates must take at least one examination in the spring of their second year and complete all examinations by May of their third year. Minor field examinations are written; the major field examination is oral. In each minor field, one professor, in consultation with colleagues, will compose and grade the written examination. An oral examination may be required if the student's performance is in doubt. The examiner should be identified at least three months before the examination.

Students who wish to delay completion of their examinations beyond the fall quarter of the third year must petition the Graduate Committee for an exception. Students who fail either their major or minor field examinations may petition the Graduate Committee for permission to repeat it at the next scheduled examination period. A second failure results in automatic dismissal.

An M.A. degree may be awarded to continuing Ph.D. students on one of the following bases:

1. Successful completion of the qualifying examinations for the Ph.D.
2. Completion of the course work equivalent to that required for the M.A. (including a graduate seminar) and an oral examination.

Note: Students who wish to receive an M.A. must apply for candidacy during the first two weeks of the quarter in which they expect to receive their degree.

DISSERTATION

Upon completion of the examinations and advancement to candidacy, the student writes a dissertation under supervision of a professor. The dissertation must be completed no later than six years from the beginning of the program. Normally, the dissertation should not exceed 250 pages, notes included. The student will defend the thesis before a doctoral committee composed of five or six professors, of which three are members of the history faculty.

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 the course work. Nevertheless, all candidates are expected to meet language requirements; to pass field examinations; to complete a dissertation; and to defend the thesis.

FINANCIAL SUPPORT

There are four types of financial aid available to graduate students in the Department of History: fellowships, research assistantships, teach-

ing assistantships, and readerships. Graduate students are eligible for one or a combination of the four forms of financial support for up to six years while in the program. Fellowships and research assistantships are granted by the Office of Graduate Studies and Research on the recommendation of the Graduate Committee. Readers are appointed by the department upon recommendation of the professor for whose course the student wishes to read. Students should, therefore, apply directly to the professor concerned. Appointments are not renewed automatically, but are approved by the department on a yearly basis. The Office of Graduate Studies and Research grants partial remission of fees for nine quarters after advancement to candidacy ("normative time") if the student is advanced to candidacy by the end of the third year. (If the student delays advancement, the amount of normative time is reduced accordingly.) Upon expiration of normative time the student must complete the dissertation or resume full payment of fees.

DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

Courses

LOWER DIVISION

HILD 1A-B-C. Latin America

Lecture-discussion survey from the establishment of Spanish and Portuguese empires to the present. Themes include social stratification, racial composition, capitalism, nationalism, and struggles for independence.

HILD 1A. Latin America: Iberian Empires and Colonial Frustrations (4)

Lecture-discussion survey describing the origins of highly stratified societies with a tendency to authoritarian rule. It traces such basic problems as mass poverty, racial prejudice, and undemocratic politics to the legacies of three centuries of Spanish and Portuguese rule. Van Young

HILD 1B. Latin America in the Shadow of the British Empire (4)

Lecture-discussion survey describing the evolution of highly stratified societies with a tendency to authoritarian rule. Traces the impact of Britain as world power in the region from the 1780s to Britain's decline in the 1930s. Discusses the impact of capitalism and nationalism on preindustrial societies in explaining the persistence of social injustice in a period of "progress." Monteon

HILD 1C. Latin America: U.S. and Struggle for Independence (4)

Lecture-discussion survey dealing with attempts to end the persistence of highly stratified societies and patterns of social injustice. Traces the impact of the U.S. on twentieth-century

Latin America, focusing on revolutionary attempts to break with old evils and the dominance of the northern colossus. Ruiz

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 3A-B-C. European Society and Social Thought

An examination by lectures and discussions of European social development and social theory from the later medieval period to the twentieth century. Important writings will be considered both as responses to and as provocations for social change in Europe. (Satisfies Muir College humanities requirements and the Revelle College additional humanities requirement.)

HILD 4A-B-C. History of Developing Nations

A survey of non-European peoples in Africa, Asia, and Latin America in their efforts to cope with imperialism and the problems of independence. Special attention is paid to indigenous political movements, economic development, and nationalism.

HILD 4A. Origins and Consequences of Underdevelopment (4)

(Cross-listed as Third World Studies 24.) 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 interrelationship 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. Reynolds (Formerly Hist. 24.)

HILD 4AW. Origins and Consequences of Underdevelopment (6)

(Cross-listed as Third World Studies 24W.) A writing-intensive version of HILD 4A that teaches writing and analytical skills in conjunction with the study of the history of the Third World peoples of Asia, Africa, and Latin America, surveyed from the fifteenth century to 1900. (Satisfies the Third College writing and societal analysis requirements.) Reynolds (Formerly Hist. 24W.)

HILD 4B. China and the West in Modern Times (4)

(Cross-listed as Third World Studies 25.) 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. Pickowicz (Formerly Hist. 25.)

HILD 4BW. China and the West in Modern Times (6)

(Cross-listed as Third World Studies 25W.) A writing-intensive version of HILD 4B that teaches writing and analytical skills in conjunction with a survey of eighteenth, nineteenth, and early twentieth-century history of China. (Satisfies the Third College writing and societal analysis requirements.) Pickowicz (Formerly Hist. 25W.)

HILD 4C. Third World: Nationalist Rebellions and Economic Development (4)

(Cross-listed as Third World Studies 26.) The course surveys the attempts of nationalist movements to seize power in Africa, Asia, and Latin America, and then to design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. The means by which such movements gain 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, Iran, and Chile are among the cases that will be examined in detail. Monteon (Formerly Hist. 26.)

HILD 4CW. Third World: Nationalist Rebellions and Economic Development (6)

(Cross-listed as Third World Studies 26W.) A writing-intensive version of HILD 4C that teaches writing and analytical skills. The course surveys the attempts of nationalist movements to seize power in Africa, Asia, and Latin America, and to then design economic programs capable of simultaneously fomenting growth and a more equitable distribution of income. (Satisfies the Third College writing and societal analysis requirements.) Monteon (Formerly Hist. 26W.)

HILD 6A-B-C. Introduction to the History of Science

Lecture courses outlining the development of science as an increasingly powerful component of Western culture and society since the end of the Middle Ages.

HILD 6A. 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; competing theologies of nature; the problem of souls and occult spirits; the science of politics and the politics of science; the origins of experimental practice; struggles over the classification of knowledge; reflections on the notion of scientific revolution; how Sir Isaac Newton restored law 'n order to the West. Westman

HILD 6B. Science between Newton and Einstein (4)

The development of the sciences and their institutions, chiefly in Europe, during the eighteenth and nineteenth centuries. The professionalization of science; the classification of the sciences and the definition of "science"; the legacy of Newtonian cosmology; geological time and evolutionary theories; theories of matter and theories of life; the place of humankind in Nature; science and religion; science in the industrial revolution. Rudwick

HILD 6C. Science and Technology in the Twentieth Century (4)

The origins and development of the modern scientific-technological enterprise, with particular reference to the growth of "big science" and the changing role of science in industry, government, and war. Cultural, social, and economic implications of major scientific advances. The interpretation of science and technology, and the growth of major science-based industries. The changing social role of the scientist. Robert M. Friedman

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)

(Cross-listed as Third World Studies 7A.) 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. (Satisfies Third College general-education requirement.) Saville

HILD 7AW. Race and Ethnicity in the United States (6)

(Cross-listed as Third World Studies 7AW.) A writing-intensive version of HILD 7A that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. (Satisfies Third College writing requirement.) Saville

HILD 7B. Race and Ethnicity in the United States (4)

(Cross-listed as Third World Studies 7B.) 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.

(Satisfies Third College general-education requirement.) McCurry

HILD 7BW. Race and Ethnicity in the United States (6)

(Cross-listed as Third World Studies 7BW.) A writing-intensive version of HILD 7B that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. The focus will be on Asian and European immigration to the United States. (Satisfies Third College writing requirement.) McCurry

HILD 7C. Race and Ethnicity in the United States (4)

(Cross-listed as Third World Studies 7C and Chicano Studies 7C.) 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. (Satisfies Third College general-education requirement.) Gutierrez

HILD 7CW. Race and Ethnicity in the United States (6)

(Cross-listed as Third World Studies 7CW.) A writing-intensive version of HILD 7C that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. Of central concern will be the Mexican-American, race, oppression, mass migration, ethnicity, city life in industrial America and power and protest in modern America. (Satisfies Third College writing requirement.) Gutierrez

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, the role of Islam in African history, the medieval status of West Africa, East Africa in medieval times, the Forest Kingdoms of West Africa, state formation in East and Central Africa, 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, 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)

Topics include African society on the eve of the slave trade, 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

HISTORY

post-independence economic development. Reynolds + (Formerly Hist. 178.)

Colloquia

HIAF 160. 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. 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 80. Japan to 1600 (4)

This introductory survey covers Japanese history and culture from earliest times through the period of "high feudalism" and the first encounters with Europeans in the 1500s. The approach is multidisciplinary, drawing together institutional developments, economic growth, art, religion, and literature. Dower (Formerly Hist. 80A.)

HIEA 81. Japan Since 1600 (4)

This survey begins with Japan's centuries of feudal isolation under the Tokugawa shoguns (1600-1868), and traces the country's emergence as a modern nation and imperialist power, culminating in World War II. Dower (Formerly Hist. 80B.)

HIEA 110. Ancient Japan and the Courty Society (4)

From earliest times through the twelfth century. Subjects covered include the origins of the Japanese; ancient myth cycles and religious beliefs; the introduction of Buddhism and Chinese thought; and the brilliant "world of the shining prince." *Prerequisite: upper-division standing or consent of instructor.* Dower + (Formerly Hist. 180A.)

HIEA 111. Japan in the Age of the Samurai (4)

Covers from the twelfth to mid-nineteenth centuries. Topics include the rise and fall of the warrior class; the nature of feudal institutions; and value systems ranging from popular religion to Zen and the "way of the warrior." Open to all students. Dower + (Formerly Hist. 180B.)

HIEA 112. Japan's Emergence as a Modern State (4)

Covers Japan's tumultuous "modern century," from the opening to the West and overthrow of the feudal regime in the mid-1800s, through rapid Westernization and industrialization, culminating in aggression abroad and defeat in World War II. Dower (Formerly Hist. 180C.)

HIEA 113. Pearl Harbor and Hiroshima: World War II in Asia (4)

Addresses the conflict in Asia from 1931 to 1945 with particular attention to the global order; the war in Japanese eyes; ideological and racial aspects of the conflict, and the legacies of the war to postwar Japan and Asia. Dower (Formerly Hist. 180D.)

HIEA 114. Occupied Japan and the Cold War in Asia (4)

Focuses on the dramatic allied (largely U.S.) occupation of Japan from 1945 to 1952, with attention to both "reform and reconstruction" within Japan and the emergence of Japan as America's leading cold-war ally in Asia. Dower (Formerly Hist. 180E.)

HIEA 120. The History of Chinese Thought and Society: The Ancient Imperial Period (4)

This course deals with the genesis of Chinese thought and institutions in Shang and Chou times as well as Han political structure and thought. + (Formerly Hist. 181A.)

HIEA 121. History of Chinese Thought and Society: The Middle Imperial Period (4)

This course deals with the decline of the Han empire, the rise of Buddhism, the transformation of Chinese society in T'ang and Sung times, and the beginnings of Neo-Confucianism. *Prerequisite: HIEA 120 or consent of instructor.* + (Formerly Hist. 181B.)

HIEA 122. History of Chinese Thought and Society: The Late Imperial Period (4)

This course deals with the economic, political, and intellectual development of China during the five hundred years before the impact of the West. *Prerequisite: HIEA 120 or HIEA 121, or consent of instructor.* + (Formerly Hist. 181C.)

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.)

Colloquia

HIEA 160. 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. *Prerequisite: department stamp or consent of instructor.* Dower (Formerly Hist. 180Q.)

HIEA 163. 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.* Department stamp required. Pickowicz (Formerly Hist. 183Q.)

HIEA 165. 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. Department stamp required.* Pickowicz (Formerly Hist. 185Q.)

HIEA 166. Self and Society in Modern Chinese Thought (4)

This course examines the confluence of traditional and modern ways of thought in China, dealing with revolutionary, liberal, and conservative trends in the twentieth century and with their relationships to traditional orientations. *Prerequisite: department stamp required or consent of instructor.* (Formerly Hist. 186Q.)

HIEA 168. Chinese Thought from Chou through Sung (4)

This course will deal with both literary and intellectual tendencies and will be designed around student interests in subjects such as Chou Confucianism, Maoism, Taoism, legalism, and eclecticism; the rise of imperial Confucianism; Buddhist thought; Neo-Confucian thought; and Sung humanism. *Prerequisite: department stamp required.* (Formerly Hist. 188Q.)

HIEA 169. 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. Department stamp required.* 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 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: Age of Michelangelo (1494–1564) (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 Council of Trent. The life of artists like Michelangelo and Benvenuto Cellini reflect the deeply felt political and spiritual crisis confronting the Italian states in an age of new monarchies. John Marino + (Formerly Hist. 105B.)

HIEU 122. Politics Italian Renaissance Style (4)

The purpose of this course is to examine the relationship between rhetoric and history. Two great contemporary Renaissance figures grappled with the problems of the citizen and the state, ideal and reality during the French invasions of Italy. What was the Renaissance state? What was the relationship between *virtu* and *fortuna*? What were Machiavellian politics? How were they modified by Guicciardini? Why is their political science the origin of modern political thought? Lecture-discussion of major historical texts of the Renaissance with special attention to war and diplomacy in the formation of modern European politics. *Prerequisite: upper division standing or consent of instructor.* Marino + (Formerly Hist. 106B.)

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. The Expansion of Europe (1450–1600) (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 1450–1600. Ritchie, Marino + (Formerly Hist. 130A.)

HIEU 127. The Expansion of Europe (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.* Ritchie, 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.* Ritchie +

HIEU 130. Europe in the Eighteenth Century (4)

(Cross-listed as Humanities 107.) 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 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 140. The Industrialization of Europe: 1750–Present (4)

The beginning of industrialization in England and its spread through nineteenth-century Europe. World War I and the redefinition of economy: private enterprise vs. social justice, big business vs. state planning, and environmental limitations on "progress." *Prerequisite: upper-division standing or consent of instructor.* Ringrose (Formerly Hist. 112B.)

HIEU 141. European Diplomatic History, 1870–1945 (4)

The creation of the alliance system and the practice of European diplomacy at its zenith. The limitations of the diplomacy and the outbreak of the First World War. Efforts at peace and peacemaking, 1917–19. The unresolved German question and the breakdown of the postwar settlement. The advent of Hitler and the disarray of the Western democracies. The Second World War: reversals of alliances and emergence of the superpowers. *Prerequisite: upper-division standing or consent of instructor.* J. M. Hughes. (Formerly Hist. 113.)

HIEU 142. European Intellectual History, 1780–1870 (4)

(Cross-listed as Humanities 114.) 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)

(Cross-listed as Humanities 119.) 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 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.)

HISTORY

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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 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 153. Modern French History (4)

A lecture-discussion course on the political and social history of France during the nineteenth and twentieth centuries. *Prerequisite: upper-division standing or consent of instructor.* Mitchell (Formerly Hist. 120.)

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

HIEU 160. Alexander the Great and the Hellenistic World (4)

A study of the conquests of Alexander with special attention to the interpretation of the legends surrounding his career and to the transformation of culture in the world ruled by his successors. *Prerequisite: department stamp or consent of instructor.* Mosshammer + (Formerly Hist. 101Q.)

HIEU 161. The Decline of Rome (4)

This course offers an in-depth study of the later Roman Empire from the death of Marcus Aurelius (180) to the disintegration of the empire in the West. Attention is focused on the Germanic invasions, cultural differentiation between East and West, and the Christian transformation of the Roman world. *Prerequisite: department stamp or consent of instructor.* Mosshammer + (Formerly Hist. 102Q.)

HIEU 162. St. Paul and the Apostolic Church (4)

This course offers a detailed study of the formative period of Christianity during the first generation after the death of Jesus (ca. 35-80 A.D.) through careful analysis of the writing transmitted in the New Testament under the name of the Apostle Paul. Attention will be focused on the development of the New Testament Christology and on the question of whether or not Paul was the purveyor of a "New Gospel." *Prerequisite: department stamp or consent of instructor.* Mosshammer + (Formerly Hist. 132Q.)

HIEU 163. Special Topics in Medieval History (4)

Intensive study of special problems or periods in the history of medieval Europe. Topics vary from year to year, and students may therefore repeat the course for credit. *Prerequisites: upper-division standing. Department stamp required. Background in European history.* Chodorow + (Formerly Hist. 104Q.)

HIEU 164. Special Topics in Early Modern Europe (4)

(Cross-listed as Humanities 105Q.) 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.) *Prerequisites: upper-division standing or graduate standing. Department stamp or consent of instructor.* Marino + (Formerly Hist. 105Q.)

HIEU 165. 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. *Prerequisites: department stamp required. Background in European history.* Ringrose + (Formerly Hist. 134Q.)

HIEU 166. 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. *Prerequisites: upper-division standing. Department stamp or consent of instructor.* Edelman + (Formerly Hist. 115Q.)

HIEU 167. Special Topics in the Social History of Early Modern Europe (4)

Topic varies from year to year. May be repeated for credit. *Prerequisites: upper-division or graduate standing. Department stamp or consent of instructor.* Truant + (Formerly Hist. 116Q.)

HIEU 168. 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. *Prerequisites: upper-division or graduate standing. Department stamp or consent of instructor.* Ringrose + (Formerly Hist. 112Q.)

HIEU 170. Special Topics in Nineteenth-Century Europe (4)

This course alternates with HIEU 171. Topics will vary from year to year. *Prerequisites: department stamp required. Background in European history.* Mitchell (Formerly Hist. 120Q.)

HIEU 171. Special Topics in Twentieth-Century Europe (4)

This course alternates with HIEU 170. Topics will vary from year to year. *Prerequisites: department stamp required. Background in European history.* Mitchell (Formerly Hist. 121Q.)

HIEU 172. 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. *Prerequisites: upper-division standing. Department stamp or consent of instructor required.* J. M. Hughes (Formerly Hist. 113Q.)

HIEU 173. Ideology and the Imagination in Modern Britain (4)

Culture and society as reflected in novels and essays. *Prerequisites: department stamp required. Background in European history.* J. M. Hughes (Formerly Hist. 122Q.)

HIEU 175. 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. *Prerequisites: upper-division standing. Department stamp or consent of instructor required.* Ringrose (Formerly Hist. 130Q.)

HIEU 176. German Thought in the Romantic Era: 1780-1830 (4)

(Cross-listed as Humanities 118Q.) Works of Kant, Schiller, Schelling, Schlegel, and Hegel will be read. (Satisfies the Humanities Program minor.) *Prerequisite: department stamp required.* Luft (Formerly Hist. 118Q.)

HIEU 177. Special Topics in Modern German Thought (4)

(Cross-listed as Humanities 119Q.) Topics will vary from year to year. (Satisfies the Humanities Program minor.) *Prerequisites: department stamp required. Background in European history.* Luft (Formerly Hist. 119Q.)

HIEU 178. Special Topics in Modern Russian History (4)

Topics will vary from year to year. May be repeated for credit. *Prerequisites: upper-division standing. Department stamp or consent of instructor.* Edelman (Formerly Hist. 110Q.)

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)

A lecture and discussion course dealing with the emergence of an awareness of the vast scale of the past history of the natural world, and the consequent dwarfing of human history, from the scholarly histories and chronologies of the seventeenth century (e.g., Ussher's well-known 4004 B.C.), to the planetary histories and radiometric dating of the twentieth. Scientific discoveries bearing on this problem will be discussed in the context of contemporary cultural issues; no advanced scientific knowledge will be required. *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 sci-

entific patronage; the revolution in printing; artisan and craft traditions; early modern scientific thinkers in medieval perspective: Copernicus, Paracelsus, Giordano Bruno, Kepler, Galileo and Descartes; critical comparisons: medieval and early modern, early modern and modern scientific cultures. *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

Colloquia

HISC 160. 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. Special topics, topics will vary from year to year. *Prerequisite: department stamp or consent of instructor.* Rudwick (Formerly Hist. 131Q.)

HISC 162. Problems in the History of Science and Religion (4)

Intensive study of specific problems in the relation between science and religion. The problems may range in period from the Renaissance to the twentieth century. Topics vary from year to year, and students may therefore repeat the course for credit. *Prerequisite: department stamp or consent of instructor.* R. M. Friedman (Formerly Hist. 182Q.)

HISC 163. 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. *Prerequisite: department stamp or consent of instructor.* Rudwick (Formerly Hist. 192Q.)

HISC 164. 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. *Prerequisite: Department stamp.* R. M. Friedman

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. Colonial Latin America: Era of Conquest (4)

The history of Latin America from 1400–1600. Lectures, reading, and discussion with emphasis on the history of Spain and Portugal, the great pre-Columbian civilizations of the New World (Inca, Aztec, Maya), and the age of exploration and conquest. Van Young + (Formerly Hist. 140A.)

HILA 101. Colonial Latin America: The Mature Colonies (4)

The history of Latin America (including Brazil) from 1600 to 1825. Lectures, reading, and discussion, with topics including slavery, social life, the evolution of political institutions, imperial rivalries, and the nature of the independence movements at the beginning of the nineteenth century. *Prerequisite: upper-division standing or consent of instructor.* Van Young + (Formerly Hist. 140B.)

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 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)

This course will introduce the students to the most relevant economic and social problems confronting the Andean region since the emergence of the Colonial System until the impact of the Crisis of 1929. This being the premise of the course, the second part will then contrast the existing theoretical literature about the processes of change. At the end of the course, we will examine the pertinence of this literature in light of the Andean experience. *Prerequisite: upper-division standing.* 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 efforts 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 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.* Ruiz (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, and the Gilded Age and aftermath, the ambivalent Revolution of Zapata and his enemies. *Prerequisite: upper-division standing or consent of instructor.* Ruiz (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.* Ruiz (Formerly Hist. 146B.)

Colloquia

HILA 160. 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. Background in Latin American history.* Staff + (Formerly Hist. 140Q.)

HILA 161. History of Women in Latin America (4)

This seminar, designed for the nonspecialist, provides a broad historical overview of Hispanic-American women's history. The course will focus on issues of gender, sexuality, and the family as they relate to women as well as the main historiographical and methodological issues in Latin American women's history. While the main emphasis of the course is Latin America, some attention will be given to Mexican-American and Chicana women in the United States. Topics may vary from quarter to quarter. *Prerequisite: department stamp or consent of instructor.* Gutierrez (Formerly Hist. 143G.)

HILA 162. 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.* Staff (Formerly Hist. 143Q.)

HISTORY

HILA 164. 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. *Prerequisite: department stamp required.* Monteon (Formerly Hist. 144Q.)

HILA 166. 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. *Prerequisites: upper-division standing. Department stamp or consent of instructor.* Ruiz (Formerly Hist. 147Q.)

HILA 170. Topics in Latin American History, 1820–1910 (4)

Topic will vary from year to year. May be repeated for credit. *Prerequisite: upper-division or graduate standing. Department stamp or consent of instructor.* Ruiz (Formerly Hist. 146Q.)

HILA 172. 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. *Prerequisite: upper-division standing. Department stamp required or consent of instructor.* 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 +

Colloquia

HINE 160. 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 or consent of instructor.* Freedman + (Formerly Hist. 136.)

HINE 170. Special Topics in Jewish History (4)

This course studies a period or theme in Jewish history. *Prerequisite: department stamp or consent of instructor.* Staff (Formerly Hist. 174.)

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.* Ritchie + (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.* Ritchie + (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 relations 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 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 from 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. History of American Foreign Relations to 1865 (4)

The first of a two-course sequence on American foreign relations from the colonial era through the Civil War. This course deals with the forces—intellectual, economic, political, and social—that shaped American policy and attitudes toward other countries. Topics in this course include the diplomacy of the American revolution, the origins of American neutrality, the Monroe Doctrine, continental expansionism, and the Civil War. *Prerequisite: upper-division standing or consent of instructor.* Staff (Formerly Hist. 169A.)

HIUS 123. History of American Foreign Relations, 1865–Present (4)

The second of a two-course sequence on American foreign relations with a focus upon the period from the Civil War to the present. This course examines the forces—intellectual, economic, political, and social—that shaped American policy and attitudes toward other countries. Topics in this course include: American imperialism, the causes and consequences of two World Wars, American-Soviet relations following 1945, and the rise and fall of the Pax Americana since Vietnam. HIUS 122 is not a prerequisite for HIUS 123. *Prerequisite: upper-division standing.* Staff (Formerly Hist. 169B.)

HIUS 126. Power in American Society (4)

(Cross-listed as Political Science 110J and Sociology 147.) This course examines the ways in which power has been conceived and contested by elites and nonelites during the course of American history. Through the writings, speeches and biographies of contestants in these struggles, the course explores the changes which have occurred in political rhetoric and struggles as America moved from a relatively isolated agrarian and commercial republic to a military and industrial empire. Topics will include the struggle over the Constitution, antebellum reform, agrarian and labor radicalism after the Civil War, the rise of socialist and communist parties after World War I, and the multifaceted protest movements of the sixties and seventies. The course ends by considering the present in light of its continuities and discontinuities with the above traditions. Hahn, Nathanson, 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, antislavery 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 Slave Trade in Comparative Perspective (4)

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. Topics to be discussed include the advent of the Atlantic slave trade, the emergence of planter classes, maroon societies in plantation America, resistance to slavery, the Haitian revolution, the changing features of slave culture and folk expressions. *Prerequisite: upper-division standing.* Saville (Formerly Hist. 159A.)

HIUS 136. Slavery and Freedom in Nineteenth-Century America: Images and Realities (4)

An examination of social, cultural, and political dimensions of the transition from slave to wage labor in the nineteenth-century United States. Topics to be discussed include nineteenth-century slave communities in plantation and nonplantation regions, the emergence of proslavery ideology and abolitionism, the coming of the Civil War, the destruction of slavery, the transition from slave to citizen, and the origins of wage labor in slaveholding and non-slaveholding states. Saville (Formerly Hist. 159B.)

HIUS 139. The Social History of American Art and Architecture (4)

A course exploring the historical relationship between the evolution of American society and culture and the development of painting, sculpture, and architecture. *Prerequisite: upper-division standing.* Ritchie (Formerly Hist. 165.)

HIUS 140. Economic History of the United States I (4)

(Cross-listed as Economics 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. There is no presumption that students have had previous training in either economics or statistics, although elements of both disciplines will be used in class and in some of the readings. *Prerequisite: upper-division standing.* Bernstein (Formerly Hist. 158A.)

HIUS 141. Economic History of the United States II (4)

(Cross-listed as Economics 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. There is no presumption that students have had previous training in either economics or statistics, although elements of both disciplines will be used in class and in some of the readings. HIUS 140 is not a prerequisite for HIUS 141.

Prerequisite: upper-division standing. Bernstein (Formerly Hist. 158B.)

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 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 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 Chicano Studies 155A.) An introduction to American borderland history with special emphasis on economic and social development of the border states during the eighteenth and nineteenth centuries. The course is designed to present various interpretations of American Southwestern history. *Prerequisite: upper-division standing.* Gutierrez (Formerly Hist. 155A.)

HIUS 159. Social and Economic History of the Southwest II (4)

(Cross-listed as Chicano Studies 155B.) This course will consider the significant trends in Mexican-American history over the past 100 years. Special emphasis will be placed on the primary documents relating to Mexican-Americans in economic and social institutions. *Prerequisite: upper-division standing.* Gutierrez (Formerly Hist. 155B.)

Colloquia**HIUS 160. 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. *Prerequisite: department stamp or consent of instructor.* Staff (Formerly Hist. 154Q.)

HIUS 161. 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. *Prerequisite: department stamp or consent of instructor.* Hahn

HIUS 163. The Transformation of the American City (4)

This seminar will examine the transformation of American cities during the eighteenth and nineteenth centuries. Through discrete examinations of changing urban spatial patterns, the emergence of urban cultural institutions, political behavior, and the changing relationship of work and home we will consider the problem of a truly urban community—of the opportunities for and limits to cultural and social interaction among classes and between men and women. *Prerequisite: department stamp or consent of instructor.* Meranze

HIUS 164. 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 instructor. *Prerequisite: department stamp or consent of instructor.* Saville (Formerly Hist. 164Q.)

HIUS 165. Segregation, Freedom Movements, and the Crisis of the Twentieth Century (4)

A reading and discussion course that views the origins of segregation and the social movements that challenged it between 1890 and 1970 in comparative perspective. *Prerequisite: department stamp or consent of instructor.* Saville

HIUS 166. 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. *Prerequisite: department stamp or consent of instructor.* Hahn (Formerly Hist. 153Q.)

HIUS 167. Topics in Mexican-American History (4)

This course will examine the historical literature concerned with the Mexican-American people in the United States. Specific topics of discussion will include immigration, urbanization, and assimilation of this population from the mid-nineteenth century to the present. Topics will vary from year to year.

HISTORY

Prerequisite: department stamp or consent of instructor. Gutierrez (Formerly Hist. 155Q.)

HIUS 168. Topics in American Legal and Constitutional History (4)

A reading and discussion course with topics that vary from year to year, but some examples are: the Constitution in historical perspective; American federalism; the history of civil liberties in the United States; the history of judicial review; the Warren Court; the common law in America. Topics will vary from year to year. *Prerequisites: at least one upper-division course in legal history or consent of instructor. Department stamp or consent of instructor. Parrish (Formerly Hist. 156Q.)*

HIUS 169. American Legal and Constitutional History (4)

Readings for advanced students in the history of American law. *Prerequisite: department stamp or consent of instructor. Parrish (Formerly Hist. 157Q.)*

HIUS 170. Topics in Colonial History (4)

This colloquium will consider late colonial history, with special attention to neglected or undigested topics including: the Great Awakening as a social movement unrelated to the American Revolution; developing markets, social communication and mobility and their impact on community integration and conflict; corporation-exclusivity, regulation and professionalization in the occupations; the origins of the American nationality; socio-economic character of the early American. Topics will vary from year to year. *Prerequisite: department stamp or consent of instructor. Ritchie + (Formerly Hist. 160Q.)*

HIUS 171. Topics in the American Revolution (4)

A colloquium dealing with special topics on the American Revolution and the formation of the United States. Themes will vary from year to year. Special topics. *Prerequisite: department stamp or consent of instructor. Ritchie + (Formerly Hist. 161Q.)*

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, the 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 Louise 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. McCurry.*

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. *Prerequisite: department stamp or consent of instructor. McCurry (Formerly Hist. 163Q.)*

HIUS 174. 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 to the present. *Prerequisite: department stamp or consent of instructor. Parrish (Formerly Hist. 166Q.)*

HIUS 175. 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. *Prerequisite: department stamp or consent of instructor. Parrish (Formerly Hist. 168Q.)*

HIUS 176. 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. *Prerequisite: department stamp or consent of instructor. Klein (Formerly Hist. 162Q.)*

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. 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. Marxian Economic Theory (4)

A survey and examination of the principal writings of Marx concerning economic theory and analysis. Emphasis on the theory of value, production, technical change, reproduction, and accumulation. Some consideration will also be made of certain neo-Marxist contributions and critiques. *Prerequisite: introductory economics or consent of instructor. Bernstein*

HITO 112. The History of Psychoanalysis (4)

A lecture-discussion course tracing the development of psychoanalysis. The late nineteenth-century intellectual context. Freud's major contributions. Psychoanalysis in practice. Post-Freudian transformations. *Prerequisite: upper-division standing or consent of instructor. J.M. Hughes*

Colloquia

HITO 160. Instant History: The Rhetoric of Contemporary History (4)

(Cross-listed as Humanities 106Q.) This course examines the relationship between rhetoric and history. Four accounts of contemporary events which were witnessed by men intimately involved in the political and military affairs surrounding them offer an unusual insight into the act of historical composition. Each work has a strong narrative thread, but it is their firsthand political acumen which transforms the record of events into

compelling literature of the first rank. Thucydides, Guicciardini, and Trotsky each wrote to convince his audience that his was the "true history," but each also argued his case from partisan ideological perspectives. The role of objectivity, the meaning of propaganda, and the techniques of rhetoric are the object of our study into the power of persuasion. (Satisfies the Humanities Program minor.) *Prerequisites: upper-division standing. Department stamp or consent of instructor. Marino + (Formerly Hist. 106Q.)*

HITO 161. 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. The course is open to graduate students and advanced undergraduates with the consent of the instructor. Hahn (Formerly Hist. 152Q.)

HITO 162. 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; the sources and organization of the managerial and financial control of enterprise; the process of technological change and dispersion in developing economies; changing patterns of land-tenure and agrarian laboring activity; alterations in the relationship between household activity and market transactions; changes in work processes and the skills of the labor force; the performance of national economic systems over time; the uneven development of national economies, or of economic regions within one nation, in the nineteenth and twentieth centuries. *Prerequisite: department stamp or consent of instructor. Bernstein*

HITO 163. 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: the origins of classical political economy; Ricardian and Neo-Ricardian economic theory; Marxian economic analysis; the marginalist revolution; the neoclassical school; the Keynesian revolution; the Cambridge controversies; monetarism; and the "new" macro-economics and supply-side theory. Special topics, topics will vary from year to year. *Prerequisite: department stamp or consent of instructor. Bernstein*

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 201. 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 202. 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 204A-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 205. 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 208A-B-C. Central Problems in European History from 1500-1945 (4-4-4)

A three-quarter sequence of readings and discussions, taught by different members of the staff each quarter. Required for all beginning graduate students, including M.A. candidates in early modern and modern European history, as well as for students preparing a secondary field in either area. 208A covers the period from 1500-1715; 208B covers from 1715-1850; and 208C covers from 1850-1945.

HIGR 209A-B-C. Seminar in Science Studies (4-4-4)

(Cross listed as Sociology 255A-B-C, and Philosophy 209A-B-C.)

A three-quarter sequence of readings and discussion, taught each quarter by a member of one of the departments (history, sociology, philosophy) participating in the graduate science studies program. Required for 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. An IP grade to be awarded the first and second-quarters; final grade will not be given until the end of the third quarter.

HIGR 210. 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 212A-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. Staff

HIGR 215. 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. M.J.S. Rudwick/R.M. Friedman

HIGR 219. Knowledge and Meaning (4)

Readings in European intellectual history since the late nineteenth century. Previous work in intellectual history is required. May be repeated as course content changes. Luft

HIGR 220A-B. Topics in Modern European History (4-4)

Varied topics in modern European 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: 220A is a prerequisite for 220B.*

HIGR 222A. Major German Authors (4)

(Cross-listed as Lit/German 252.) A study in depth of the work of one major German author. May be repeated for credit as topics vary. Luft

HIGR 229A-B. Seminar in British Empire History (4-4)

Topics on the history of the British Empire. May be repeated for credit.

HIGR 230A. Department Colloquium (1-4)

A forum for the presentation of new research by students, faculty, and visiting scholars. The course will be offered quarterly under the direction of regular faculty members.

HIGR 230B. Department Colloquium (1-4)

A forum for the presentation of new research by students, faculty, and visiting scholars. The course will be offered quarterly under the direction of regular faculty members.

HIGR 230C. Department Colloquium (1-4)

A forum for the presentation of new research by students, faculty, and visiting scholars. The course will be offered quarterly under the direction of regular faculty members.

HIGR 234. Spain since 1750 (4)

Readings and critical analysis of selected topics and important works in the history of Spain since 1750. May be repeated as content changes. Proficiency in Spanish required to repeat course, but not for the first time taken.

HIGR 236A-B. Seminar in Spain since 1870 (4-4)

Topics in the history of Spain since 1870. 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 237A-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. Propp

HIGR 240A-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. Van Young

HIGR 241A-B. Readings and Seminar on South 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. Reading knowledge of Spanish and/or Portuguese is helpful but not required. Monteon

HIGR 242A-B. Readings and Seminar on Mexico, Cuba, and Central America (4-4)

A two-quarter course involving readings and research. Students are expected to compose a paper based on original research that is due in the second quarter. Reading knowledge of Spanish required. Ruiz

HIGR 244. Topics in Colonial Latin America (4)

One or two topics in colonial history will be analyzed in depth; reading knowledge of Spanish is expected. Van Young

HIGR 245. 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. Monteon or Ruiz

HIGR 246A-B. History of Mexico (4-4)

A research and study seminar of two quarters with primary emphasis on social change and the Mexican Revolution of 1910. 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. *Prerequisite: 246A is a prerequisite for 246B.* Ruiz

HIGR 247A-B-C. Seminar/Literature of Latin America (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. Monteon, Ruiz, and Van Young.

HIGR 248. History and Social Theory (4)

A reading seminar, meeting weekly, with a substantial writing component. Reading and discussion will focus in three areas: some recent major works in historical sociology and large-scale history; interdisciplinary approaches to historical questions (anthropological, sociological, psychoanalytic, etc.); and historical method. Graduate students from all historical fields welcome, though emphasis will be primarily on the early modern period (1500-1800). *Prerequisite: graduate standing or consent of instructor.* Van Young

HIGR 249. The Culture of Consumption (4)

(Cross listed as Communications 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 will focus primarily, but not exclusively, on the United States. Students will be encouraged to think comparatively. Klein

HIGR 250A-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 251. Readings in American History (4)

Readings and discussion in selected areas of American history for advanced graduate students. An IP grade will be awarded for HIGR 251; students should then sign up for HIGR 253 the following quarter to receive a grade for both quarters. Taught each quarter by a different member of the staff. Letter grade only.

HIGR 252. 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 253. Research Seminar in United States History

A research seminar for advanced graduate students in United States History devoted to the presentation, discussion, and evaluation of work in progress.

HIGR 254A-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. Parrish

HIGR 260A-B. War and Society (4-4)

A research seminar on the impact of war on societies. The first quarter will be devoted to readings and discussions and the second quarter 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.

HIGR 261A-B. United States History, 1789-1877 (4-4)

The United States in the colonial period. Ritchie

HIGR 266A-B. American Society in the Twentieth Century (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

HIGR 268A-B. American Society in the Twentieth Century (4-4)

A two-quarter research seminar. Students will receive training in the archival sources and research techniques relevant to study of selected topics on American society since ca. 1900. Individual research papers. An IP grade will be awarded at the end of the first quarter.

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 271A-B. Seminar on Quantitative Methodology in History (4-4)

A research seminar on quantitative methods in history. The first quarter will be devoted to instruction in elementary statistics and use of the computer and the second quarter to the writing of individual research papers. An IP grade will be awarded at the end of the first quarter and a final grade given only at the end of the second quarter.

HIGR 277A-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. Reynolds

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. *Prerequisite: graduate standing with advancement to candidacy.*

HIGR 298. Directed Reading (1-12)

Guided and supervised reading in the literature of the several fields of history. (S/U grades permitted.)

HIGR 299. Thesis Direction (1-12)

Independent work by graduate students engaged in research and writing of doctoral theses. (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.)

HIGR 501. Apprentice Teaching in Humanities (1-4)

Consideration of pedagogical methods appropriate to the teaching of literary, historical, and philosophical texts at the undergraduate level. Pedagogical aids for the teaching of composition. Supervised teaching in sections of the undergraduate humanities sequence. The student must be a teaching assistant or fellow-teaching assistant in Revelle College. (S/U grades only.)

HIGR 503. Teaching in Third World Studies (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.)

3-4-5, four units each). Humanities 1 and 2 *must* be taken before Humanities 3-4-5.

THE HUMANITIES MINOR PROGRAM

The humanities minor consists of six courses chosen from the following listings. All of these six *may* be selected from the upper-division offerings, but at least three upper-division courses *must* be included. Students are advised to discuss specific plans for completing the minor with the humanities adviser as well as with the advisers in their college.

Normally, students interested in majoring in the humanities must choose a specific major within the humanities, i.e., history, literature, or philosophy. Students from Revelle and Muir Colleges may request to graduate with an approved individual/special project major in the humanities.

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)

Study of the two cultures that together formed the foundation on which Western civilization is built. Study of the Hebrew Bible in the context of the ancient Near Eastern world; examination of texts from literary, historical, and theological perspectives. Study of the Hellenic world; examination of works of poetry, drama, philosophy, and history. This course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of writing and reading laboratory. *Prerequisite: Satisfaction of the Subject A requirement.* (W)

2. Rome, Christianity, and the Medieval World (6)

This course explores the foundations of civilization in Western Europe by examining the three discrete strands of Roman, Christian, and Germanic culture. Humans, gods, and politics are our themes from the late classical world through the Middle Ages. The course offers intensive instruction in writing university-level expository prose. Three hours of lecture, two hours of writing and reading laboratory. *Prerequisite: Satisfaction of the Subject A requirement.* (S)

3. Renaissance, Reformation, and Early Modern Europe (4)

This period recapitulates many of the classical and medieval concerns about the nature of the state and the state of nature. Three critical issues come to the fore at the beginning of the sixteenth century: rational political analysis follows the French invasions of Italy, examination of humanity's place in the world follows the discovery of America, and religious reform and renewal follow from church abuses and biblical scholarship. Humanism offers a new critical method to evaluate the validity of texts and tradition while it encourages committed ethical con-

HUMANITIES

OFFICE: 1512 Galbraith Hall, Revelle College

The Humanities Program courses are offered jointly by the Departments of History, Literature, and Philosophy and are intended to provide an interdisciplinary introduction to major aspects of the Western humanistic tradition. Students learn to interpret important literary, historical, and philosophical documents through lectures and discussions as well as through the writing of themes.

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

duct. Three hours of lecture, one hour of discussion. *Prerequisite: Satisfaction of the Subject A requirement.* (F)

4. Enlightenment, Romanticism, Revolution, Reaction (1660-1848) (4)

Triumphs of empirical science in the seventeenth and eighteenth centuries prepared the way for the Enlightenment's far-reaching revisions of traditional views about ethics, religion, and the prospects for human happiness. Revolutions in England (1688), America (1776), and France (1789) combined with the rise of classical liberalism and romantic ideas of human nature to challenge traditional forms of social and political life. Three hours of lecture, one hour of discussion. *Prerequisite: Satisfaction of the Subject A requirement.* (W)

5. The Crisis of European Culture (1848-present) (4)

This course emphasizes the crisis of European culture and the liberal tradition in the nineteenth and twentieth centuries. Readings stress the challenges from Marx, Nietzsche, and Freud and the political upheavals and conflicts since the First World War, particularly the Russian Revolution and the fascist era. Three hours of lecture, one hour of discussion. *Prerequisite: Satisfaction of the Subject A requirement.* (S)

UPPER DIVISION

102. Literature of Renaissance (4)

(Same as Lit/Gen 102.) A study of literary/humanistic texts from various cultures involved in the European Renaissance. *Prerequisite: upper-division standing or consent of instructor.*

105Q. Special Topics in the History of Early Modern Europe (4)

(Same as History HIEU 164.) Topics will vary from year to year. *Prerequisite: upper-division standing or consent of instructor.*

106Q. Instant History: The Rhetoric of Contemporary History (4)

(Same as History HITO 160.) This course examines the relationship between rhetoric and history. Four accounts of contemporary events which were witnessed by men intimately involved in the political and military affairs surrounding them offer an unusual insight into the act of historical composition. Each work has a strong narrative thread, but it is their firsthand political acumen which transforms the record of events into compelling literature of the first rank. Thucydides, Guicciardini, and Trotsky wrote to convince his audience that his was "true history," but each also argued his case from partisan ideological perspectives. The role of objectivity, the meaning of propaganda, and the techniques of rhetoric are the object of our study into the power of persuasion. *Prerequisite: upper-division standing or consent of instructor.*

107. Europe in the Eighteenth Century, 1688-1789 (4)

(Same as History HIEU 130.) 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 are family life, urban and rural production, unrest, the poor, absolutism, and the Enlightenment from Voltaire to Rousseau. *Prerequisite: upper-division standing or consent of instructor.*

114. European Intellectual History, 1780-1870 (4)

(Same as History HIEU 142.) 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.*

118Q. German Thought in the Romantic Era: 1780-1830 (4)

(Same as History HIEU 176.) Works of Kant, Schiller, Schelling, Schlegel, and Hegel will be read.

119. European Intellectual History, 1870-1945 (4)

(Same as History HIEU 143.) 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. *Prerequisite: upper-division standing or consent of instructor.*

119Q. Special Topics in Modern German Thought (4)

(Same as History HIEU 177.) Topics will vary from year to year. *Prerequisite: background in European history.*

124. Studies in European Romanticism (4)

(Same as Lit/Gen 105.) 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. *Prerequisite: upper-division standing or consent of instructor.*

131Q. The Historical Novel (4)

(Same as History 131Q.) Works of Stendhal, Tolstoy, Thomas Mann, and Solzhenitsyn will be studied in their historical context. Among the questions to be treated: their factual accuracy, their choice of the novel as a form, their interpretations of history. Oral and written reports will be expected.

132A-B-C. The Rise of Christianity (4-4-4)

(Same as Lit/Gen 106A-B-C.) A study of the origins and development of Christian thought, history, literature, and institutions during the formative period from the birth of Jesus to the Middle Ages. The first quarter is devoted to the background in post-biblical Judaism and pagan religions during the early Roman empire. The second quarter focuses on New Testament literature, the early Fathers, and the history of the Church in the Ante-Nicene period (A.D. 325). The third concentrates on the impact of Christianity on Western Europe during the Middle Ages and the fusion of Christian and pagan cultures in the Latin, Germanic, and Celtic traditions. *Prerequisite: upper-division standing or consent of instructor.*

145. Nihilism (4)

(Same as Philosophy 145.) 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.

148. The Bible and Western Literature (4)

(Same as Lit/Gen 148 and Lit/He 148.) Biblical and related texts that influenced the great writers of the Middle Ages and Renaissance, including selections from the Jewish and Christian scriptures. *Prerequisite: upper-division standing or consent of instructor.*

150. Aesthetics (4)

(Same as Philosophy 150.) 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.

152. Philosophy and Literature (4)

(Same as Philosophy 152.) Philosophy and Literature: 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.

161. Epic Poetry (4)

(Same as Lit/Gen 161.) A study of major epics, in translation if their original language is not English. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

164. Philosophy of History (4)

(Same as Philosophy 164.) A study of classical and contemporary conceptions of history and historical knowledge.

167. Folk and Fairy Tales (4)

(Same as Lit/Gen 167.) 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 taken for repeated credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

179A. Ancient Religions (4)

(Same as History HITO 100.) 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 or consent of instructor.*

179B. Western Religions (4)

(Same as History HITO 101.) A comprehensive study of the Western religious traditions of the world. The course will cover Judaism, Christianity, and Islam. *Prerequisite: upper-division standing or consent of instructor.*

179C. Asian Religions (4)

(Same as History HITO 102.) A comprehensive study of the Asian religious traditions of the world. The course will cover Hinduism, Taoism, Shinto, and Confucian thought. *Prerequisite: upper-division standing or consent of instructor.*

181. Mythology (4)

(Same as Lit/Gen 181.) A study of various bodies of myth: their content, form, and meaning. May be taken for repeated credit as topics vary. *Prerequisite: upper-division standing or consent of instructor.*

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 department.*

INTERNATIONAL RELATIONS AND PACIFIC STUDIES GRADUATE SCHOOL (IR/PS)

OFFICE: Building 4, Level 1, Robinson Building Complex

Professors

Peter Cowhey, Ph.D.
Peter Evans, Ph.D.
Peter Gourevitch, Ph.D., *Dean*
Chalmers Johnson, Ph.D.
Miles Kahler, Ph.D.
Alex Kane, Ph.D.
Lawrence Krause, Ph.D.
R. John McMillan, Ph.D.
John Gerard Ruggie, Ph.D.

Associate Professors

Mary Ruggie, Ph.D.
Susan Shirk, Ph.D.
Yasu-Hiko Tohsaku, Ph.D.

Assistant Professors

Tun-jen Cheng, Ph.D.
 Yasushi Hamao, Ph.D.
 Takeo Hoshi, Ph.D.
 Barry Naughton, Ph.D.
 Luis Rivera-Batiz, Ph.D.
 Frances Rosenbluth, Ph.D.
 Matthew Shugart, Ph.D.

Senior Lecturer

Herman Gadon, 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.
 Zalmay Khalilzad, Ph.D.
 David Mares, Ph.D.
 Lisa Martin, Ph.D.
 Michael May, Ph.D.
 Peter H. Smith, Ph.D.
 Christena Turner, Ph.D.

**THE MASTER'S DEGREE 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 demonstrated leadership ability, previous professional employment, and a history of meaningful international experiences.

Applicants must submit three letters of recommendation from individuals who can attest to their academic or professional competence and to their interest in pursuing graduate training in international affairs.

Applicants are required to submit the Graduate Record Exam (GRE) scores (verbal, quantitative,

and analytical). (Indicate code #R4836 for UCSD.) 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.

Interviews are not required for admission to the MPIA program, but are available for all applicants who wish further information about the degree programs. Interviews are an effective means for the staff to explain the school's graduate programs as well as how these programs relate to the applicant's long-term goals. Applicants are advised to contact the IR/PS office well in advance of the January 15 application deadline to schedule appointments at (619) 534-5914.

The MPIA program requires two years of full-time study to satisfy the degree requirements. Those students who enter with no previous language training in Chinese, Japanese, or Spanish will need to spend two and one-half to three years in the program. Students must pass a competency language examination before receiving the MPIA degree. A minimum course load is twelve quarter-units per quarter. Due to the integrated nature of the MPIA curriculum, no part-time students will be admitted at this time.

**THE MPIA CURRICULUM*
 (NINETY-SIX UNITS)**

The Core Curriculum is designed to integrate the range of subjects taught.

1. **Economics** (managerial economics, macroeconomy and economic policy, international economics)
2. **Management** (accounting, finance, strategic analysis)
3. **Quantitative Methods** (three-quarter sequence)
4. **International Relations** (international politics, politics of international economic relations, international security)
5. **Comparative Policy Environments** (three-quarter sequence)

Regional Specialization and Foreign Language

1. **Regional Specialization** (eight units). Students are required to obtain some familiarity with one particular country or region in the Pacific. To

fulfill this requirement, students must take two courses in one of three areas: China, Japan, or Latin America. (Additional areas will be incorporated into the curriculum as the school expands.)

2. **Foreign Language** (twelve units). Upon achievement of a minimum level of competency students enroll in two-unit per quarter Language for Professional Proficiency courses. Students' designated foreign language must roughly correspond to the geographical area selected for regional specialization.

*Note: The MPIA curriculum is currently undergoing minor revision. Students are advised to check with IR/PS for curriculum requirements.

**Sample Two-Year Master's Program
 (Eighteen Units per Quarter) for
 Students Concentrating in
 International Management**

First Year

Fall

1. Managerial Economics (4)
2. Comparative Policy Environments (4)
3. Accounting (4)
4. Language for Professional Proficiency (2-4)
5. Quantitative Methods (2)

Winter

1. Macroeconomy and Economics Policy (4)
2. Comparative Policy Environments (4)
3. Finance (4)
4. Language for Professional Proficiency (2-4)
5. Quantitative Methods (2)

Spring

1. International Economics (4)
2. Comparative Policy Environments (4)
3. Strategic Analysis (4)
4. Language for Professional Proficiency (2-4)
5. Quantitative Methods (2)

Second Year

Fall

1. International Politics (4)
2. Regional Specialization (4)
3. Career/Regional Concentration (4)
4. Language for Professional Proficiency (2-4)
5. Policy Workshop (2)

Winter

1. Politics of International Economics Relations (4)
2. Regional Specialization
3. Career/Regional Concentration (4)

4. Language for Professional Proficiency (2-4)
5. Policy Workshop (2)

Spring

1. International Security (4)
2. Career/Regional Concentration (4)
3. Career/Regional Concentration (4)
4. Language for Professional Proficiency (2-4)
5. Policy Workshop (2)

Sample Two-Year Program (Eighteen Units per Quarter) for Students Concentrating in International Relations or Comparative Public Policy

First Year

Fall

1. Managerial Economics (4)
2. Comparative Policy Environments (4)
3. International Politics (4)
4. Language for Professional Proficiency (2-4)
5. Quantitative Methods (2)

Winter

1. Macroeconomy and Economics Policy (4)
2. Comparative Policy Environments (4)
3. Politics of International Economic Relations (4)
4. Language for Professional Proficiency (2-4)
5. Quantitative Methods (2)

Spring

1. International Economics (4)
2. Comparative Policy Environments (4)
3. International Security (4)
4. Language for Professional Proficiency (2-4)
5. Quantitative Methods (2)

Second Year

Fall

1. Accounting (4)
2. Regional Specialization (4)
3. Career/Regional Concentration (4)
4. Language for Professional Proficiency (2-4)
5. Policy Workshop (2)

Winter

1. Finance (4)
2. Regional Specialization (4)
3. Career/Regional Concentration (4)
4. Language for Professional Proficiency (2-4)
5. Policy Workshop (2)

Spring

1. Strategic Analysis (4)
2. Career/Regional Concentration (4)
3. Career/Regional Concentration (4)

4. Language for Professional Proficiency (2-4)
5. Policy Workshop (2)

CONCENTRATIONS AND ELECTIVES

Acknowledging the wide diversity in student backgrounds, interests and needs, the MPIA program offers flexibility with regard to elective course work. Students may declare a career or regional concentration, which will enhance career entry opportunities and improve initial on-the-job performance. Although concentration in a regional or career area is not mandatory, it further enables individuals to work more closely with students and faculty who share similar interests.

CAREER CONCENTRATIONS

To obtain a career concentration, the student is required to take four courses (sixteen units) within one of the three designated areas: international management, international relations, or comparative public policy.

International Management: This concentration includes intermediate and advanced courses in the areas of finance, accounting, and marketing similar to those offered in MBA 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 on the political-military relations among states, as well as political dimensions of their economic 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 market, technology and natural resources, health, and social security. Students may also choose to concentrate in a particular industry such as energy or telecommunications. 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 beyond the two regional specialization courses required as part of the core curriculum. The main areas of concentration currently include China, Japan, and Latin America. (A concentration on Korea is expected to be available by the 1991-92 academic year. In the meantime, a few courses will be offered addressing Korea's rise as a major economic power in the Pacific Rim.) Other re-

gional concentrations such as Southeast Asia, Oceania, Australia, and New Zealand will be offered as the faculty and language training resources of the school expand.

POLICY WORKSHOPS

The policy workshops (a three-quarter sequence) introduce policy and management case studies simulating the real-world issues that students will address in their professional lives. The workshops serve as the capstone sequence for the MPIA program and are 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 cases examined. The material introduced is designed to develop analytical, technical, and communications skills.

FOREIGN LANGUAGE

The faculty of the school consider foreign language competency to be an important and indispensable skill for international affairs professionals. All students are expected to acquire the language skills necessary to work in the Pacific region. The foreign language competency requirement is designed to ensure that students achieve a level of competency sufficient for professional interaction.

Students can fulfill the foreign language requirement in Chinese, Japanese, Korean, or Spanish. The language selected for the requirement must coincide with the student's area of regional specialization. Because languages are not equally difficult to learn, the level of required competency varies among these languages. The minimum competency requirement for the master's degree is 2+ on the Foreign Service Institute Scales (FSI) for Spanish and 2- for 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 through UCSD. Students are encouraged to take beginning and intermediate language courses offered by the Chinese Studies Program, the Japanese Studies Program, and the Department of Linguistics to prepare them for the proficiency examination. The school is currently offering two- to four-unit Language for Professional Proficiency courses for several different levels of students in the three languages. The director of the IR/PS Language Program will help students design their language programs.

Students may prepare for the proficiency examination in a variety of ways, depending on

their language background when they enter the program: (1) those who enter with a rough equivalence to two years of Chinese, Japanese, or Korean or one plus years of Spanish will usually be able to achieve the requisite level in two years through a combination of intensive language study in the summer and the six language maintenance courses in the two-year program. (2) Those who enter with a rough equivalence of three years of Chinese, Japanese, or Korean 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 no previous training in these foreign languages will need to spend two and one-half or three years in the program. Intensive summer sessions for two or three summers and a combination of language maintenance and regular language courses during the academic year should enable students to achieve the required proficiency. Other languages of the Pacific region may also be used to fulfill the foreign language requirement.

Certification of advanced language competence will be available to students who wish to devote extra time and effort to language study. Ordinarily only students who enter with intermediate language skills or who spend three years in the program will be able to achieve this level of proficiency.

Note: The MPIA curriculum is currently undergoing minor revision. Students are advised to check with IR/PS for exit requirements.

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

Career services is an integral part of the program offered by the Graduate School of International Relations and Pacific Studies. The Career Services Office provides students with assistance in career development and job placement. This assistance begins in the students' first quarter and continues through the interviewing process in the final quarter.

Career services available include individual advising appointments, workshops, speaker forums, special events, and a library containing numerous international resources and employment opportunity listings. Specialized workshops are offered each quarter on resume writing, cover

letters, salary and benefits negotiation, job-offer evaluation, interviewing skills (including videotaped mock interviews), career goals, labor market trends, and effective job search strategies.

THE PH.D. IN INTERNATIONAL AFFAIRS

The program leading to the doctor of philosophy in international affairs is designed for students of outstanding ability who wish to do 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 wish 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. Scores from the Graduate Management Admissions Test (GMAT) may be substituted. 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.

PROGRAM OF STUDY

The Ph.D. program prepares students for research careers in international affairs dealing with 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. In contrast to doctoral programs within existing social science departments which follow the intellectual agendas of their disciplines, the Ph.D. program in international affairs takes an interdisciplinary approach to the policy issues of the Pacific region.

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 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 in the school. With this committee, the student works out a plan of study which the committee must approve.

THE MAJOR FIELD AND MINOR FIELDS

- International Economic Policy and Management
- International Relations
- Comparative Policy Analysis

At the time of application into the Ph.D. in international affairs program, students must declare a major in international economic policy and management, international relations, 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 design and 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 may consider 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.

GRADUATE POLICY SEMINAR

All students must participate in the Graduate Policy Seminar for at least two quarters. This seminar will bring together advanced Ph.D. students and faculty to discuss policy issues in the Pacific region. The course will require students to make presentations of literature reviews, research papers, and a dissertation prospectus.

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 in IR/PS. Courses should be taken at the graduate level. Students who have completed master's programs may discuss with the Program

Advisory Committee ways of adapting their previous course work to the Ph.D. program.

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 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 COMPARATIVE POLICY ANALYSIS

The core requirements for a major in comparative policy analysis include courses in managerial economics, public finance, macroeconomy and economic policy, 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 Admissions at (619) 534-5914.

THE INTERNATIONAL MID-CAREER ASSOCIATES PROGRAM

The International Mid-Career Associates Program is designed for working professionals seeking additional exposure to the various areas of international management, international relations, and comparative public policy. Under the auspices of the program, professionals from the Pacific region have an opportunity to further internationalize their knowledge and experience as well as enhance their professional development in such areas as finance, accounting, quantitative methods, econometrics, long-range strategic planning, international affairs, and comparative decision making. Participants in the program spend an academic year at IR/PS beginning in mid-September and ending in mid-June.

IR/PS offers:

1. An individualized one-year program of study 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. Access to UCSD libraries, IR/PS and campus events, and recreational facilities
7. IR/PS-sponsored cultural events
8. Field excursions to local, state, and national organizations and government offices
9. Administrative assistance in visa procurement, housing, etc.
10. Access to computers and language laboratories

The cost of the International Mid-Career Associates Program for 1990-1991 is \$10,000 (USA). Travel, housing, and living expenses must be underwritten by either the associate or the sponsoring agency. Health insurance must be purchased and is available through the University of California, San Diego at reasonable rates. UCSD Extension offers year-round language training for an additional fee through its English Language Program. For further information, contact the International Mid-Career Associates Program office at (619) 534-7420.

Courses

MPIA CORE CURRICULUM

IP/Core 400A-B-C. Comparative Policy Environments (4-4-4)

A three-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 influence the way in which political choices are made.

IP/Core 401. Managerial Economics (4)

Microeconomics from the managerial perspective. Included will be such topics as demand theory, cost and production theory, pricing in nonstrategic markets, pricing in oligopolistic markets, uncertainty and insurance, regulation and market failure.

IP/Core 402. Macroeconomy and Economic Policy (4)

Determinants of aggregate output, employment and the price level. Analysis of long-term and short-term economic fluctuations. Theories and international comparisons of fiscal and monetary policy, and the international monetary system.

IR/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)

An introduction of the study of international politics which focuses on the origins and evolution of the international order conducted after World War II. Postwar diplomatic history is combined with the core concepts and analytical approaches of international relations as a field of study. The emphasis is on critical policy choices and their intended as well as unintended consequences.

IP/Core 411. The Politics of International Economic Relations (4)

The course presents explanations for the political organization of the international economy, in particular, arguments linking the distribution of international power to characteristics of the international political economy. Principal issue areas and their organization are surveyed. Foreign economic policies of major states are examined. Explanations for international inequality such as dependency are considered.

IP/Core 412. International Security (4)

An examination of the origins, character, and consequences of the fundamental security dilemma faced by states, and of the possible means by which states can seek to cope with it. The phenomena explored include the causes of war and the conditions of peace; arms races and arms control; the balance of power; deterrence; alliances and security regimes; and the current strategic debate involving the U.S., the Soviet Union, and their respective allies.

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 422. 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/Core 430. Economic and Social Development of China (4)

This course examines China's development 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 given 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 political situation in Latin America. Historical roots of democracy, authoritarianism, and revolutionary change in countries of Central and South America are examined. 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 455A-B-C. Quantitative Methods Laboratory (2-2-2)

A three-quarter course sequence designed to provide proficiency in the use and appreciation for the limitations of basic quantitative modeling and data analysis. Students will be required to learn and use Lotus 1-2-3 and SYSTAT software programs. The first quarter will focus on basic algebraic manipulations and the ability to use Lotus. The second quarter will treat statistics and the use of SYSTAT. The third quarter will focus on the broader skills required to use data analysis to support de-

cision making. This will include problem definition, modeling, optimization, sensitivity analysis, and the ability to import SYSTAT output into Lotus for further analysis.

IP/Core 456A-B-C. Policy Workshop (2-2-2)

Students work in teams on a sequence of problems in business or governmental strategy designed to simulate a real-world work situation. The workshops give students the opportunity to apply their knowledge and skills in a situation similar to what they will confront in their professional work. Each quarter of the three-quarter workshop introduces the students to materials intended to develop their analytical, technical, and communication skills.

IP/Core 470A-F, 471A-F, 472A-F. Chinese Language for Professional Proficiency (2-4)

A three-quarter course sequence designed to enable students at different levels of proficiency to maintain and improve their Chinese language skills through a combination of classes, language laboratories, exercises, and other language experiences. Emphasis is on oral skills.

IP/Core 473A-E, 474A-E, 475A-E. Japanese Language for Professional Proficiency (2-4)

A three-quarter course sequence designed to enable students at different levels of proficiency to maintain and improve their Japanese language skills through a combination of classes, language laboratories, exercises, and other language experiences. Emphasis is on oral skills.

IP/Core 476A-E, 477A-E, 478A-E. Spanish Language for Professional Proficiency (2-4)

A three-quarter course sequence designed to enable students at different levels of proficiency to maintain and improve their Spanish language skills through a combination of classes, language laboratories, exercises, and other language experiences. Emphasis is on oral skills.

IP/Kor 1A-B-C. First-Year Korean Language (4-4-4)

An introductory course in the Korean language designed to impart the basic level of linguistic skills to students with no previous knowledge of the language. Students will practice listening, speaking, reading, and writing through lectures, class discussions, tutorials for conversation practice, laboratory sessions, and other activities.

GENERAL COURSES

IP/Gen 400. International Relations of the Pacific (4)

A survey of the international relations and the developing international political economy among the nations bordering the Pacific Ocean. Topics include: emergence of the "Pacific Basin" concept; the role of the U.S. and "hegemonic stability" theory in the Pacific; the legacies of the Korean War and the Sino-Soviet dispute; patterns of immigration and their consequences; and Japan's relations with China, the USSR, the U.S., and Mexico.

IP/Gen 402. Political Dimensions of International Finance (4)

An examination of the effects of national policies and international collaboration on international finance. Three areas will receive particular attention: 1) the question of an international lender of last resort; 2) national regulation and influence over international financial actors in the major industrialized economies, and 3) the role of the developing countries in the international financial system, during the debt crisis and beyond the debt crisis. The course will consider both public international financial organizations (International Monetary Fund, World Bank, regional development banks) and private financial institutions. *Prerequisites: IP/Core 411, or permission of instructor.* Conjoined with Political Science 144D and 262.

IP/Gen 403. International Institutions (4)

The role of international institutions in the contemporary world system. Institutions are defined broadly to include regimes, norms, and conventions as well as formal organizations. *Prerequisites: IP/Core 410, 411, and 412, or permission of instructor.*

IP/Gen 404. Nuclear Strategy and Arms Control (4)

A study of some current questions on nuclear weapons policy, nuclear deterrence and arms control, starting with an overview of the basic features of nuclear explosions, their effects, and the relevant military systems. Conjoined with STPA 166.

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, 403, and 422.*

IP/Gen 421. International Marketing (4)

The objectives of this course are to provide an opportunity to work on an international related project, and to allow discussion of topics particularly important in international marketing. Students will develop two reports for a U.S. firm potentially considering entering another country's domestic market. First, a "Go/No-Go" positioning report will be presented. Second, a thorough marketing plan will be expected. A corporate sponsor will be sought for the project. *Prerequisites: IP/Core 455A, B, and C, and IP/Gen 420.*

IP/Gen 422. Investments (4)

Topics covered are: 1) the major characteristics of risk management in capital markets by various players; 2) security prices that result from the pursuit of optimal portfolios by investors; 3) the role of international diversification and the dynamics of exchange rates; and 4) regulatory and policy aspects of investments in capital markets, as illustrated by controversy over takeovers and acquisitions. *Prerequisites: IP/Core 421, and 455A, B, and C.*

IP/Gen 423. Industrial Organization (4)

The topics covered are: 1) the interactions among firms, and between firms and consumers; 2) how firms compete and collide; 3) the efficiency implications of different market institutions; and 4) public policy toward industry. *Prerequisites: IP/Core 401, 402, 403, and 422.*

IP/Gen 424. Corporate Finance (4)

The topics covered are: 1) dividend policy and capital structure; 2) options; 3) debt financing; and 4) short- and long-term financial planning. Course format will consist mostly of lectures, with occasional cases. Some international aspects of corporate finance will also be discussed. *Prerequisite: IP/Core 421.*

IP/Gen 425. The Internal Organization of the Firm (4)

The topics covered are: 1) the employment relationship; 2) separation of ownership and control; 3) principal-agent relationships; 4) hierarchies; 5) team production; 6) incentive effects of alternative forms of organization; 7) the boundaries between the firm and the market. *Prerequisites: IP/Core 401, 402, and 403.*

IP/Gen 426. Firm Strategy in the World Economy (4)

The main objective of this course is to review and discuss the alternatives open to foreign firms that invest in the largest Latin American countries. Mexico will be examined, focusing business strategy and the relationship between the public and private sectors. The relative advantages of operating as a multinational corporation affiliate, a joint venture, or an in-bond (*maquiladora*) plant are discussed in sectoral and case studies.

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 covered are strategic management, organization structures, personnel systems, work attitudes, and compensation plans. Systematic data as well as case studies are presented.

IP/Gen 428. Human Behavior in Organizations (4)

This course focuses on the behavior of people in work organizations and on the factors that influence such behavior. Subjects to be covered will be the psychology of the individual, interpersonal relations, the small work group, relations between groups, conflict resolution, organizational structure, rewards and punishments, leadership, and the structures and culture of the larger global, sociopolitical environment. Teaching methods will include analysis of case studies, review of experiences in simulations, and examination of the organization of the class in this course, as well as lectures.

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, analysis of the current global trend towards financial deregulation, and an historical overview of financial markets in comparative perspective.

IP/Gen 450. Comparative Government-Business Relations (4)

Explores the general issue of the interaction between market forces and government, focusing on mediation between the public and private sectors. Examines several principal mediation mechanisms, including 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)

Comparative patterns of industrialization and agricultural modernization. Emphasis on certain common features of the modernization process and widely varying endowments, policies, and experiences of different countries. *Prerequisites: IP/Core 401, 402, and 403, or permission of instructor.*

IP/Gen 452. Comparative Welfare States (4)

This course first examines the growth of the welfare state in the advanced industrial societies and studies a variety of welfare state models. It then investigates the nature of current tensions in contemporary welfare states and considers their future implication. Finally, it assesses possibilities for developing forms of social provision in newly emerging welfare states. Among the major issues discussed are various roles of the state in social provision, and decentralization and privatization of welfare state functions. Conjoined with Sociology 245.

IP/Gen 453. Comparative Social Policy (4)

A macrosociological and comparative perspective of the field of social policy analysis, with an empirical focus on social security, health, welfare, and labor market policies. The course examines these policies in different national contexts to understand both the variety of policy forms and the factors that support alternative policy choices. It also considers the implications of various policies for changes in the role of the state

and the private sector in social provision. Conjoined with Sociology 265.

IP/Gen 464. History of the Modern Chinese Revolution: 1911-1949 (4)

This course deals with the formative period of the twentieth-century Chinese Revolution. Considerable emphasis 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. Conjoined with HIEA 131.

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 macro-economic problems. Economic analysis of the state-dominated mixed economy emerging from current reforms. *Prerequisites: IP/Core 401, 402, and 403, or permission of instructor. IP/Core 430 recommended.*

IP/Gen 470. Japan's Emergence as a Modern State (4)

This course covers Japan's tumultuous "modern century," from the opening to the West and overthrow of the feudal regime in the mid-1800s through rapid Westernization and industrialization, culminating in aggression abroad and defeat in World War II. Conjoined with HIEA 112.

IP/Gen 471. Japanese Economy (4)

A broad survey of the Japanese economy, together with in-depth examination of some distinctively Japanese phenomena in the areas of savings behavior, financial structure, industrial organization, and labor markets. *Prerequisites: IP/Core 401, 402, and 403.*

IP/Gen 476. Latin America: Society and Politics (4)

A survey of the literature on Latin American social structures and political systems. The emphasis will be historical and comparative, and most readings will deal with the entire area or a group of countries rather than particular cases. Conjoined with Sociology 188D. (Formerly numbered IP/Gen 409.)

IP/Gen 477. Latin American Politics (4)

This is an introductory reading seminar on Latin American politics. Its purpose is to acquaint students with leading schools of thought in the field, to provide critical perspective on premises and methodology, and identify themes for further inquiry. Specific themes will include authoritarianism, revolution, democratization, regional conflict, and the emergence of middle-level powers. Students will take an active part in discussions. The other basic requirement will be an analytical paper, approximately twenty to thirty pages in length.

IP/Gen 478. Mexican Economic Policy (4)

This course concentrates its attention on the development and stabilization policies that the current and the two previous Mexican administrations have implemented since the mid-seventies. Anti-inflation, debt, trade, foreign-direct-investment, and industrial policies are analyzed and discussed in the framework of national development plans and sectoral programs.

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 482. East Asian NICS (4)

This course explains the rise and evolution of dynamic economies in East Asia. Focuses on four natural resource-poor states: South Korea, Taiwan, Hong Kong and Singapore, as well as two natural resource-rich states: Malaysia and Thailand. Starts with theoretical models of economic development, then delves into the making and implementation of development pol-

ITALIAN STUDIES

icies and strategies, and finally discusses sociopolitical causes and consequences of development. *Prerequisites: IP/Core 401, 402, and 403, or 410, 411, and 412, or permission of instructor.*

IP/Gen 483. Comparative Economic Systems (4)

Economic systems of developed and developing countries. Centrally planned, socialist market, developmental capitalist, and developed market economics will be examined. Will include, among others, the Soviet Union, China, Japan, Brazil, and the U.S. *Prerequisites: IP/Core 401, 402, and 403, or permission 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)

This course will be an analytical review of the past performance of the South Korean economy giving special attention to major changes of policy such as the shift from an import-replacement to an export-promotion strategy, the promotion of heavy and chemical industries, etc. The industrial structure of Korea will be examined. The present role of the government and the links between Korea and other countries will be analyzed. Some attention will also be given to the economy of North Korea.

IP/Gen 487. Concepts and Aspects of Revolution (4)

Introduction to the analytical and comparative study of revolutionary movements and related forms of political violence. Topics include: the classical paradigm; types of revolutionary episodes; psychological theories; ideology and belief systems; coups; insurgencies; civil wars; terrorism and revolutionary outcomes. Conjoined with Political Science 140B.

IP/Gen 488. Comparative Cultural Environments (4)

A course on the interpretation of similarities and differences of cultural forms and social forces that prepares students to understand and to 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 an IR/PS faculty member. May be repeated for credit.

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.

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 can change the system itself.

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 student's paper will be presented before the Graduate Policy Seminar.

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 policy making 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 policy making 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)

All doctoral candidates must participate in this three-quarter sequence. This seminar will bring together advanced Ph.D. students and faculty to discuss policy issues in the Pacific region. The course will require students to make presentations of literature reviews, research papers, and a dissertation prospectus.

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.

IP/Gen 299. Independent Research (2-12)

Independent research under the guidance of a faculty member in IR/PS.

ITALIAN STUDIES

OFFICE: 3071 Humanities and Social Sciences Building, Muir College (CAESAR Office)

Associate Professors

John Marino, Ph.D., *History*

Stephanie Jed, Ph.D., *Italian and Comparative Literature*

Jon R. Snyder, Ph.D., *Italian and Comparative Literature*

Assistant Professors

Jack Greenstein, Ph.D., *Visual Arts*

Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*

Italian studies is an interdisciplinary program in the language, literature, history, and art of

Italy. Italian studies coordinates the resources of the Departments of History, Literature and Visual Arts, and offers students the opportunity to design a major, leading to a B.A., around the course offerings of these three departments. Students in Italian studies are encouraged to participate in the University of California Education Abroad Program (EAP), which is affiliated with the Universities of Padua, Venice, and Bologna; this provides the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Italian studies. EAP credits may be transferred back to UCSD to coordinate with on-campus offerings.

THE MAJOR PROGRAM

A major in Italian studies consists of a choice of twelve upper-division courses in literature, history, and visual arts approved for the program and listed below. Each of the three areas (literature, history, and visual arts) must be represented in the student's program of study, with at least two courses from each field. The particular courses making up each student's major will be selected in consultation with the program adviser. Literature 115 (Dante) 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

Lit/It 100. Introduction to Italian Literature

Lit/It 161. Advanced Stylistics and Conversation

Lit/It 122. Studies in Modern Italian Culture

Lit/It 136. Studies in Modern Italian Poetry

Lit/It 137. Studies in Modern Italian Prose

- Lit/It 110. Selected Topics in Italian Literature (may be repeated for credit as topics vary)
- Lit/It 115. Dante: The *Divina Commedia*
- Lit/It 190. Seminar
- Lit/It 198. Directed Group Study
- Lit/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 (Italian 1A-B-C, 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

Yasu-Hiko Tohsaku, *Assistant Professor, International Relations and Pacific Studies*
 Christena Turner, *Assistant Professor, Sociology*
 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, History, Linguistics, Literature, 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, 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

■ ANTHROPOLOGY

- 45. Everyday Religiosity in Japan
- 49. Japanese Culture and Society
- 112. Femininity and Masculinity in Japan
- 122. Japanese Psychology and Psychotherapies
- 146. Everyday Religiosity in Japan
- 167. Japanese Popular and Mass Culture
- 257. Ethnographies of Japan

■ 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**

■ 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

(Permission of the instructor is required for undergraduate students.)

- IP/Gen 400. International Relations of the Pacific

JAPANESE STUDIES

OFFICE: 3071 Humanities and Social Sciences Building, Muir College

Faculty

- John W. Dower, *Joseph Naiman Professor of History and Japanese Studies*
- Takeo Hoshi, *Assistant Professor, International Relations and Pacific Studies*
- Chalmers Johnson, *Rohr Professor of Pacific International Relations*
- Hifumi Ito, *Lecturer, Japanese Language*
- Emiko Kiyochi, *Lecturer, Japanese Language*
- Sige-Yuki Kuroda, *Professor, Linguistics*
- Masao Miyoshi, *Hajime Mori Professor of Japanese, English, and Comparative Literature*
- Masato Nishimura, *Lecturer, Japanese Language*
- Jennifer Robertson, *Assistant Professor, Anthropology*
- Frances Rosenbluth, *Assistant Professor, International Relations and Pacific Studies*
- Yumiko Shiotani, *Lecturer, Japanese Language*

JUDAIC STUDIES

IP/Gen 471. Japanese Economy

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: 6016 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 Spiro, Ph.D., *Anthropology*

Associate Professors

Jonathan Saville, Ph.D., *Theatre*
Gershon Shafir, Ph.D., *Sociology*

Assistant Professor

William H. Propp, Ph.D., *History*

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 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.

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)

Anthropology 189. Zionism as a Social Movement (4)

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

HINE 100. The Ancient Near East and Israel (4)

The history of Israel is studied in the context of ancient Near Eastern civilizations 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. (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. 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. 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 Parthian-Sasanian East. Topics include assimilation and survival; antisemitism and missionizing; patterns of organization and autonomy; cultural and religious developments. Goodblatt

HINE 104. The Bible and the Ancient Near East (4)

This 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 I, HINE 100, Cultural Traditions 1A, or any other courses in Bible.* Freedman (Formerly Hist. 137.)

HINE 108. The Middle East before Islam (4)

The people, 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. Goodblatt

HINE 160. 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. Freedman (Formerly Hist. 136.)

HINE 170. Special Topics in Jewish History (4)

This course studies a period or theme in Jewish history. Staff (Formerly Hist. 174.)

HINE 199. Independent Study in Near Eastern History (4)

Directed readings for undergraduates under the supervision of various faculty members. Consent of the instructor and the academic adviser required. Staff

HITO 100. Ancient 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. Staff (Formerly Hist. 179A.)

HITO 101. Western Religions (4)

A comprehensive study of the Western religious traditions of the world. The course will cover Judaism, Christianity, and Islam. Staff (Formerly Hist. 179B.)

HIGR 237A-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 188F. Modern Jewish Societies and Israeli Society (4)

▼ LANGUAGE

See particular languages under linguistics (beginning and intermediate) or literature (advanced).

▼ LATIN AMERICAN STUDIES

OFFICE: 109 Institute of the Americas Building

Professors

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*

Ramon Ruiz, Ph.D., *History*

Harold Simon, Ph.D., *Community and Family Medicine*

Peter H. Smith, Ph.D., *Political Science, Program Chairman*

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*

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*

Harley Shaiken, Ph.D., *Communication*

Eric Van Young, Ph.D., *History*

Leon Zamosc, Ph.D., *Sociology*

Assistant Professors

Graciela Kaminsky, Ph.D., *Economics*

Aralia Lopez-Gonzalez, Ph.D., *Literature*

Matthew Shugart, Ph.D., *Political Science*

Marcelo Suarez-Orozco, Ph.D., *Anthropology*

Lecturer

Dee Dee Halleck, B.A., *Communication*

MASTER'S DEGREE PROGRAM

The Faculty Graduate 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; at least twenty-four of the units must be graduate-level courses; 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. Either a comprehensive examination or a master's thesis.

Courses

This course is required for 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, Warren Campus

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 in 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 intern-

ship. 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 annual 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, Warren Campus.

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 (Prerequisite: Political Science 40)
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

168—Topics in American Legal and Constitutional History

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

124—Contemporary Moral Issues

127—Professional Ethics

Political Science

102H—Political and Legal Foundations of the American Economy

104F—Constitutional Law Seminar

105A—Comparative Legal Cultures

Psychology

162—Psychology and the Law

Sociology

141—Crime and Society

142—Social Deviance

144—Forms of Social Control

Urban Studies and Planning

124—Land Use Planning

171—Practical Urban Land Use Problems

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, Warren Campus.

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 Campus. 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 Psychology and Linguistics Building, Muir College

Professors

Matthew Y. Chen, Ph.D.

Jeffrey L. Elman, Ph.D.

Edward S. Klima, Ph.D.

S.-Y. Kuroda, Ph.D.

Ronald W. Langacker, Ph.D., *Chairman*

Margaret Langdon, Ph.D.

Leonard Newmark, Ph.D.

David M. Perlmutter, Ph.D.

Sanford A. Schane, Ph.D.

Tracy D. Terrell, Ph.D.

Assistant Professors

Farrell Ackerman, Ph.D.

Suzanne Kemmer, Ph.D.

Barbara J. Levergood, 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.

The Department of Linguistics at UCSD also offers elementary and intermediate 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.

REQUIRED LINGUISTICS COURSES

Before deciding to undertake a linguistics major, a student should take Linguistics 10. Required linguistics courses should then be taken as early as possible for maximum benefit to the student in other upper-division courses.

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: Grammatical Structure

- Ling/Gen 121: Syntax I
- Ling/Gen 130: Semantics

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 147: Classical Languages
- Ling/Gen 150: Historical Linguistics
- Ling/Gen 151: Language History
- Ling/Gen 154: History of English

OTHER LINGUISTICS ELECTIVES

- Ling/Gen 103: Language and Consciousness
- Ling/Gen 105: Law and Language
- Ling/Gen 160: 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
- Ling/Gen 178: Bilingualism and English as a Second Language
- Ling/Gen 182: Linguistics and Poetics
- Ling/Gen 184: Orthography

RESTRICTED COURSES

- Ling/Gen 195: Apprentice Teaching (0-4)
[does not count as a linguistics elective]
- Ling/Gen 198: Directed Group Study in Linguistics (2 or 4)
- Ling/Gen 199: Independent Study in Linguistics (2 or 4)
- Ling/Gen 199H: Honors Independent Study in Linguistics (4)

UNDERGRADUATE LANGUAGE REQUIREMENT

Linguistics majors must demonstrate proficiency in one foreign language and must in addi-

tion 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 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.

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 Linguis-

tics (with Specialization in Theoretical Linguistics)."

Theoretical Linguistics

- 5 required linguistics courses
- Ling/Gen 115: Phonology II
- Ling/Gen 125: Syntax II
- Ling/Gen 160: 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 103: Language and Consciousness
 - 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: 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.

In addition to the major requirements for graduation, the honors program requires two graduate linguistics courses and 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, Third, and Warren: For Fifth, Muir, Third, and Warren 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, Albanian, 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 second-language acquisition. The department has a wide array of research facilities. The phonetics laboratory contains a full complement of modern equipment for research in acoustic and articulatory phonetics as well as speech perception. The phonetics laboratory houses 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 Department of Linguistics directs foreign language instruction for the campus through its lower-division language courses, many opportunities are provided for instruction and research in second language acquisition.

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 three to four courses in the general area of syntax/semantics; three to four courses in the general area of phonology/phonetics; 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: Basic Language Program Office, 2125, Psychology and Linguistics Building, Muir College

Students are placed in foreign language courses based on the results of a placement test administered during orientation and on prior preparation. Students who miss the placement exam should contact the Basic Language Program Office (P&L 2125) for instructions. In general, students with no prior exposure to or knowledge of a language should begin their study with Linguistics 1A and 1Ax. Students who have studied a language for two or three years in high school (or one term at college) within the past four years should enroll in Linguistics 1B and 1Bx. Students who have studied a language for four years in secondary school (or for two terms in college) should enroll in Linguistics 1C and 1Cx or Linguistics 1D and 1Dx.

Conversation sections (Linguistics 1A-1B-1C-1D) consist of a combination of small tutorial meetings with a native speaker, plus reading and assigned laboratory work. Analysis sections (Linguistics 1Ax-1Bx-1Cx-1Dx) consist of weekly group grammar discussion sections led by a linguist, assigned laboratory work, and outside reading. Each course in the 1A-1B-1C-1D series must be taken concurrently with the corresponding course in the 1Ax-1Bx-1Cx-1Dx series.

Courses numbered Linguistics 11 are self-instructional courses intended for students whose interest in learning the language is only to read it for scholarly purposes. They are particularly aimed at graduate students preparing to fulfill French or German reading requirements.

The Language Laboratory at UCSD offers a rich collection of materials that can be used for self-instruction in a variety of languages. To encourage students to take advantage of these ma-

terials, academic credit may be granted to students for introductory-level study of certain languages on a self-instructional basis in the Language Laboratory. Interested students should enroll in Linguistics 19. On the first day of the quarter students enrolled in Linguistics 19 must meet with a Linguistics 19 supervisor, who will establish a program of study and arrange for mid-term and final examinations. Depending on the availability of suitable materials in the Language Laboratory, Linguistics 19 courses may be offered for two, three or four units of credit and may, for some languages, be repeated for credit.

■ CHINESE

See:
Chinese Studies

■ FRENCH

Ling/Fr 1A. French Conversation (2)

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)

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)

Small tutorial meetings with a native speaker of French. Must be taken in conjunction with Ling/French 1Bx. *Prerequisites: two or more years of French in high school, or Ling/French 1A or equivalent.*

Ling/Fr 1Bx. Analysis of French (2)

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. *Prerequisites: two years of high school study of the language, Ling/French 1Ax, or equivalent.*

Ling/Fr 1C. French Conversation (2)

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)

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)

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)

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

Lit/Fr 2A. Readings and Interpretations (4)

Lit/Fr 2B. Readings and Interpretations (4)

Lit/Fr 2C. French Composition (4)

Lit/Fr 50. Readings/Interpretations (4)

■ GERMAN

Ling/Ge 1A. German Conversation (2)

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)

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)

Small tutorial meetings with a native speaker of German. Must be taken in conjunction with Ling/German 1Bx. *Prerequisites: two or more years of German in high school or Ling/German 1A, or equivalent.*

Ling/Ge 1Bx. Analysis of German (2)

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. *Prerequisites: two years of high school study of the language, Ling/German 1Ax, or equivalent.*

Ling/Ge 1C. German Conversation (2)

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)

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)

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)

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

Lit/Ge 2A. Readings and Interpretations (4)

Lit/Ge 2B. Advanced Readings and Interpretations (4)

Lit/Ge 2C. Composition and Conversation (4)

■ GREEK

See: Department of Literature

■ HEBREW

See: Judaic Studies

■ ITALIAN

Ling/It 1A. Italian Conversation (2)

Must be taken in conjunction with Ling/Italian 1Ax. *Prerequisite: no prior study of Italian required.*

Ling/It 1Ax. Analysis of Italian (2)

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)

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)

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)

Must be taken in conjunction with Ling/Italian 1Cx. *Prerequisite: Ling/Italian 1B.*

Ling/It 1Cx. Analysis of Italian (2)

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)

Must be taken in conjunction with Ling/Italian 1Dx. *Prerequisite: Ling/Italian 1C.*

Ling/It 1Dx. Analysis of Italian (2)

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.*

■ JAPANESE

See: Japanese Studies

■ LATIN

See: Department of Literature

■ PORTUGUESE

Ling/Port 1A-1B-1C. Fundamentals of Portuguese (4-4-4)

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.*

■ RUSSIAN

See: Department of Literature

■ SPANISH

Ling/Sp 1A. Spanish Conversation (2)

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)

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)

Small tutorial meetings with a native speaker of Spanish. Must be taken in conjunction with Ling/Spanish 1Bx. *Prerequisites: two or more years of Spanish in high school, or Ling/Spanish 1A, or equivalent.*

Ling/Sp 1Bx. Analysis of Spanish (2)

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. *Prerequisites: two years of high school study of the language, Ling/Spanish 1Ax, or equivalent.*

Ling/Sp 1C. Spanish Conversation (2)

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)

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)

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)

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 41. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials include grammar review, television news broadcasts, newspaper readings, classroom discussion and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

Ling/Sp 42. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political

science, sociology, economics, and general current political and economic affairs. Topics and materials include grammar review, television news broadcasts, newspaper readings, classroom discussion and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

Ling/Sp 43. Intermediate Spanish for the Social Sciences (2)

This series of two-unit courses is to increase the student's language skills in order to interact professionally with native speakers of Spanish in the following areas: history, political science, sociology, economics, and general current political and economic affairs. Topics and materials include grammar review, television news broadcasts, newspaper readings, classroom discussion and essay writing. *Prerequisite: At least three semesters/four quarters of college Spanish or permission of instructor.*

See also: Department of Literature

Lit/Sp 2A. Readings and Interpretations (4)

Lit/Sp 2B. Composition and Conversation (4)

Lit/Sp 2C. Cultural Readings (4)

Lit/Sp 50A. Peninsular Literature (4)

Lit/Sp 50B. Latin American Literature (4)

Lit/Sp 50C. Latin American Topics (4)

■ 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	Igbo
Albanian	Irish Gaelic
American Sign Language	Italian
Arabic (Eastern)	Japanese
Arabic (Egyptian)	Kannada
Arabic (Iraqi)	Korean
Arabic (Moroccan)	Malay
Arabic (Saudi)	Mongolian
Bengali	Navajo
Bulgarian	Norwegian
Burmese	Persian
Chinese (Cantonese)	Polish
Chinese (Mandarin)	Portuguese
Czech	Romanian
Danish	Russian
Dutch	Serbo-Croatian
Esperanto	Spanish
Finnish	Swahili
French	Swedish
German	Tagalog
Greek (Modern)	Thai
Haitian Creole	Tibetan
Hausa	Turkish
Hawaiian	Twi
Hebrew (Modern)	Vietnamese
Hindi-Urdu	Welsh
Hungarian	Yoruba

Courses

LINGUISTICS
LOWER DIVISION**5. Introduction to Language (4)**

An interdisciplinary approach to language. Topics, which vary from year to year, will be drawn from: languages of the world and the origin of language; the role of language in thought, advertising, law, communication, literature, social interaction, and mystical experiences; spoken and visual languages; and the question of whether other species can learn human language. Intended primarily for non-majors.

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.

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.

UPPER DIVISION

103. Language and Consciousness (4)

Language and how it influences our perception of the universe; the Sapir-Whorf hypothesis. Psychological, physical, and linguistic aspects of space/time. The role of language in altered states of consciousness.

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 phonological structure of natural languages. Exercises in phonological description. The empirical justification of phonological analyses.

115. Phonology II (4)

Current theoretical approaches to the sound structure of languages. *Prerequisite: Linguistics 111.*

120. Grammatical Structure (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.

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.

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, Albanian, Chinese, Germanic, Hungarian, Japanese, Luiseño, Old Icelandic, Romance, Slavic, Uto-Aztecan, Yuman, 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.*

147. Classical Languages (4)

An investigation of the phonology, morphology, and syntax of Sanskrit, classical Greek, or Latin. Reading and translation of selected texts. May be repeated for credit when topics vary.

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.

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, Indo-European, Japanese, Uto-Aztecan, Yuman, 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. Formal Linguistics (4)

Mathematical foundations of the formal syntax of natural languages. Introduction to the theory of formal languages, in particular context-free languages, and its relation to automata theory.

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. Orthography (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 of the Department of Linguistics. (P/NP grades only.) *Prerequisite: consent of instructor. May be repeated for credit.*

199H. Honors Independent Study in Linguistics (4)

The student undertakes a program of research and advanced reading in linguistics under the supervision of a faculty member in the Department of Linguistics. (P/NP grades only.) *Prerequisite: admission to Honors Program.*

GRADUATE

NOTE: Unless otherwise specified, the following graduate courses may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

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.

211. Introductory Phonology (4)

Introduction to theoretical concepts, methods of analysis, phonetic transcription, and descriptive apparatus.

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.

219. Recent Approaches to Phonology (4)

Recent theoretical proposals are examined critically and confronted with relevant data. Since the subject matter changes, this course may be repeated for credit.

221. Introductory Syntax (4)

Introduction to theoretical concepts, methods of analysis, and descriptive apparatus, concentrating on syntactic constructions, major hypotheses, and argumentation techniques.

222. Theories of Syntax (4)

Current theoretical approaches: one particular approach is explored in a given quarter. 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. Emphasis is placed on the ways data from other languages contribute to an understanding of the language under intensive study, and the contributions of that language to an understanding of linguistic universals and language differences. Since the language chosen for intensive study will vary from year to year, the course may be repeated for credit.

229. Recent Approaches to Syntax (4)

Recent theoretical proposals are examined critically and confronted with relevant data. Since the subject matter changes, this 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.

238. Lexicography (4)

Principles and methods of lexicography. Topics may include: history of dictionary making, purposes of lexical collections, types of dictionaries, computer implementations.

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, Albanian, Chinese, Germanic, Hungarian, Japanese, Old Icelandic, Romance, Uto-Aztecan, Yuman, 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, Indo-European, Japanese, Uto-Aztecan, Yuman, 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.

260. Formal Linguistics (4)

Theory of formal grammars, with particular emphasis on context-free grammars. Aspects of theories of automata and computation related to grammatical systems. Relationship of the hierarchies of automata and grammars.

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)

Advanced material in special areas of the study of formal grammars to be selected by the instructor. May be repeated for credit. *Prerequisite: Linguistics 260 or consent of instructor.*

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.

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.

286. Philosophy of Language (4)

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.

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. Current Research (4)

Discussion and evaluation of specific proposals bearing on linguistic theory.

294. Topics in Research in Progress (0)

Presentation and discussion of faculty and student research currently in progress. (S/U grades only.)

295. Topics in Research in Progress (0)

Presentation and discussion of research currently in progress at other universities and institutions. (S/U grades only.)

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.

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.*

LITERATURE

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.

Donald T. Wesling, Ph.D., *English and American Literature, Writing*

Sherley Anne Williams, M.A., *American and Afro-American Literature, Writing*

† Andrew Wright, Ph.D., F.R.S.L., *English Literature*

Wai-lim Yip, Ph.D., *Chinese and Comparative Literature*

Associate Professors

Jack Behar, Ph.D., *American Literature*

Robert Cancel, Ph.D., *African and Comparative Literature*

Steven Cassedy, Ph.D., *Slavic and Comparative Literature*

† Alain J.-J. Cohen, Ph.D., *Comparative Literature*

Stephen Cox, Ph.D., *English Literature; Director, Revelle Humanities Writing Program*

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*

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*

William S. Tay, Ph.D., *Chinese 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

Nicole Hoffman, Ph.D., *English and American Literature*

Beth Holmgren, Ph.D., *Russian and Comparative Literature*

• Lisa Lowe, Ph.D., *Comparative Literature*

George Mariscal, Ph.D., *Spanish Literature*

William A. O'Brien, Ph.D., *German and Comparative Literature*

†-Roddey Reid, Ph.D., *French Literature*

† Pasquale Verdicchio, Ph.D., *Italian and Comparative Literature*

Winifred Woodhull, Ph.D., *French Literature*

Adjunct Professor

Patricia Terry, Ph.D., *French and Comparative Literature*

Emeriti Professors

Diego Catalan, Ph.D.

Roy Harvey Pearce, Ph.D.

John L. Stewart, Ph.D.

* On leave 1990-91

† On leave fall quarter

- On leave winter quarter

• On leave spring quarter

All literature courses at UCSD are offered by a single Department of Literature. The department brings together teacher-scholars and students who would elsewhere be separated by the languages in which the national literatures are written. Here, they are united by the nature of the studies they pursue. This lends a comparatist 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 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 in courses where English is the primary language, students in lower-division courses should write a minimum of 2,500 words per course. In upper-

LITERATURE

UNDERGRADUATE PROGRAM: 3110 Literature Building

GRADUATE PROGRAM: 3110 Literature Building

ADMINISTRATIVE OFFICE: 3110 Literature Building

Professors

• Ronald S. Berman, Ph.D., *English Literature*

Carlos Blanco-Aguinaga, Ph.D., *Spanish Literature*

Jaime Concha, Ph.D., *Spanish and Latin American Literature*

Charles Cooper, Ph.D., *Writing; Coordinator, College Writing Programs*

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*

Edwin S. Fussell, Ph.D., *English and American Literature, Writing*

Marcel Henaff, Ph.D., *French and Comparative Literature*

Fanny Howe, *Writing*

Susan Kirkpatrick, Ph.D., *Spanish and Comparative Literature; Chairperson*

Reinhard Lettau, Ph.D., *German 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*

Jerome Rothenberg, M.A., *English and American Literature, Writing*

division courses the minimum requirement is 4,000 words per course.

THE MAJOR IN LITERATURE

There are seven majors available to students within the Department of Literature: English-American, French, general literature, German, Russian, Spanish, and writing. 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 Chinese, Classical Greek, Hebrew, Italian and Latin, as well as the previously mentioned French, German, Russian, Spanish, and for those concentrating in a foreign literature, English-American. 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 upper-division courses 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; in 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 Lit/Sp 50A-50C. For majors other than English-American, two courses from Lit/En 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.

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 sat-

isfy 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 through EAP).

HONORS PROGRAM

The department offers a special program of advanced study for outstanding undergraduates majoring in literature. Admission to this program ordinarily requires an overall GPA of 3.5 and a literature major GPA of 3.7 at the end of the junior year. Students meeting these requirements will be sent, the following fall, an invitation to participate in the program. In unusual cases, admission may also be granted to a senior who, though not meeting the GPA requirements, has submitted to the Literature Honors Committee by the end of the third week of fall quarter a petition for admission supported by three recommendations from members of the literature faculty. During the winter quarter of their senior year, all honors students together take an honors seminar (Lit/Gen 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 (Lit/— 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.

SPECIAL STUDIES

Special Studies (the 199s) may be taken only by students whose departmental GPA is at least 3.0. Students not satisfying this requirement may, with detailed justification by the instructor concerned, petition for an exception to the regulation. At least 4,000 words of writing—or what is in the judgment of the instructor the equivalent—are required in 199s.

INDIVIDUAL PROGRAM REQUIREMENTS

PRIMARY CONCENTRATION IN ENGLISH AND AMERICAN LITERATURE

1. Lit/English 21, 22, 23, and 24. Even if some or all of these courses are used toward meeting a college's humanities or general-education requirements, they still count toward meeting the requirements for the English and American literature major. Note: Students may substitute one course from Lit/English 17, 18, 19 for one course in this lower-division sequence.
2. Nine upper-division courses in English and American literature, including at least one course from each of the following five categories:
 - a. English literature before 1640
 - b. English literature from 1640 to 1800
 - c. English literature from 1800 to the present
 - d. American literature before 1860
 - e. American literature after 1860
3. Three courses, of which at least one must be upper-division (except French, where two upper-division courses are required), in a secondary literature, given substantially in a language other than English. See the heading, "The Major in Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement.
4. 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. Lit/Fr 115-116, Themes in French
 - 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. At least one of these must be an upper-division course. See the heading, "The Major in Literature," above, for detailed information on which lower-division courses may be used toward meeting this requirement.
3. Upper-division electives chosen from Department of Literature offerings to make a total of twelve upper-division courses.

LITERATURE

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German Literature

1. Nine upper-division courses in German literature.
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 on which lower-division courses may be used toward meeting 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. Lit/Ru 101A-B-C
 - b. Lit/Ru 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. Lit/Sp 50A, Peninsular Literature
 - b. Either Lit/Sp 50B or Lit/Sp 50C, Latin American Literature
2. Nine upper-division courses as follows:
 - a. Lit/Sp 130A, Development of Spanish Literature
 - b. Lit/Sp 130B, Development of Latin American Literature
 - c. Lit/Sp 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 on which lower-division courses may be used toward meeting 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 classes (Lit/Sp 2A, 2B, 2C, 50A, 50B, and 50C) for additional review of Spanish grammar, further 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 Third World literature (Africa, Asia, and Latin America). 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, of which at least one must be upper-division (except French, where two upper-division courses are required), in a foreign literature, given in a language other than English. See the heading, "The Major in Literature," above, for detailed information on which lower-division courses may be used toward meeting 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 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.

PRIMARY CONCENTRATION IN WRITING

The writing major is designed to provide directed experience in writing prose fiction and nonfiction, drama 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 both lower- and upper-division requirements for the writing major differ from those for other primary concentrations in the Department of Literature. The major requirements are as follows:

1. Any of the following literature sequences:
 - a. Lit/Gen 4A-B-C-D-E-F—any three courses in the sequence (Fiction and Film in Twentieth-Century Societies)
 - b. Lit/Gen 6A-B-C (Understanding Literature)
 - c. Lit/Gen 19A-B-C (Introduction to the Ancient Greeks and Romans)
 - d. Lit/En 21, 22, and one course chosen from Lit/En 17, 18, 19, 23, or 24.
 - e. Thr Wld 21, 22, 23 (Third World Literatures)
2. Either of these alternatives:
 - a. Any two courses from the sequence Lit/Writing 140-145. Students electing to take two courses from the 140 sequence may not apply them, as well, towards the six upper-division literature electives.
 - b. Two courses from the sequence Writing 8A, 8B, 8C—The Craft of Writing
3. A minimum of twelve upper-division courses:
 - a. Six upper-division courses in Lit/Writing from the writing workshop sequence. 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. Six upper-division electives chosen from Department of Literature offerings; at least four of these courses must be outside the Lit/Writing sequence.

4. Three Department of Literature courses given in a language other than English. At least one of these must be upper-division (except French, where two upper-division courses are required). See the heading, "The Major in Literature," above, for detailed information on which lower-division courses may be used to meet this foreign literature requirement.

Writing students should note that as of 1988-89, requirement 2 has been changed substantially from its previous form. From now on, students must complete either two courses from the 140 series (writing, rhetoric, and pedagogy) or any two of the three craft courses, Lit/Writing 8A, 8B, 8C. The latter sequence is designed to introduce the creative writer to the history and structure of fiction, poetry, and nonfictional prose and must be taken before upper-division workshops in each genre. Although these craft courses will not be workshops themselves, they will involve creative exercises and "hands-on" experience. Students having begun the writing major before fall 1988 may fulfill the appropriate former requirements.

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 are required to complete nine upper-division courses for the writing major as follows:

1. Six upper-division workshops
2. Three upper-division literature courses.

All other requirements of the major must be met. This includes the lower-division sequence requirement, two courses from either of the two alternatives listed in the writing major, and the secondary literature requirement. Upper-division courses used to complete the secondary literature requirement may be applied toward the total of nine upper-division courses. 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/American—Lit/En 17, 18, 19, 21, 22, 23, 24, 50

French—Lit/Fr 2A, 2B, 2C, 50

German—Lit/Ger 2B, 2C, 51, 52, 53

Greek—Lit/Gk 1, 2, 3

Hebrew—Judaic 1, 2, 3 (see Judaic Studies)

Italian—Lit/It 2A, 2B, 50

Latin—Lit/La 1, 2, 3

Russian—Lit/Ru 2A, 2B, 2C

Spanish—Lit/Sp 2A-B-C, 50-A-B-C

General Minor—Any six literature courses.

There must be three upper-division courses. No more than two courses in writing may be applied toward the general minor.

Writing Minor—The writing minor is a flexible program open to students in all academic departments. Students interested in writing fiction may focus their work in the poetry or prose fiction courses. Students interested in informational writing of various types or in research writing may focus their work in a wide range of nonfictional prose offerings.

The requirements of the writing minor are six courses chosen from Lit/Writing 8A, 8B, 8C, 100-144. At least three of the courses must be upper-division. These courses must be in at least two major genres.

THE GRADUATE PROGRAM

DOCTORAL DEGREE PROGRAM

Doctoral programs are offered in English and American literature, French literature, German literature, Spanish literature, and comparative literature. Students in the doctoral program may qualify for the M.A. under Plan 1 (modified thesis plan). (See "Graduate Studies: The Master's Degree.") The C. Phil. degree is conferred upon all students advanced to candidacy for the Ph.D.

PREPARATION

The following are requirements for admission to graduate study in literature:

1. A baccalaureate 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
3. A complementary working knowledge of a second literature and its language.

COURSE OF STUDY

Although most students will choose to concentrate in a national literature, there will necessarily be a distinctly comparatist emphasis in their studies. Each student will undertake a comparatist project—course work and guided independent study in a literature other than, but related to, the one in which he or she is specializing. The program of study makes explicit provision for a significant amount of independent work. Tutorial work and interdisciplinary study are encouraged; in addition, all graduate students work in close association with an adviser who directs their independent study preparatory to the qualifying examination. Few specific courses are required. On the contrary, graduate students take those seminars best suited to their individual needs and interests. Students are required to enroll in a minimum of twelve seminars, or their equivalent, during the first six quarters of graduate study, and receive credit for their participation on a satisfactory/unsatisfactory basis. Students who have received an M.A. or its equivalent elsewhere may request transfer credit for up to six seminars. While completing the twelve-seminar requirement, students are expected to write six term papers at the rate of one per quarter.

SPECIALTY IN COMPOSITION THEORY AND RESEARCH

In keeping with the theoretical interdisciplinary tradition in the department, doctoral students in English and American literature 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 in English and American literature. 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. Independent study and guided research are available with faculty who work directly in this subspecialty. Only students with a strong interest in theory and research should consider the subspecialty in composition studies. They will be joining an active, research-oriented group of faculty and doctoral students. 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 to follow seminar discussions or lectures in a second language, that is, a language other than the one in which the literature of their primary specialization is written. Each student must demonstrate language proficiency through regular enrollment in and completion of a seminar in the literature of the second language, or, in exceptional cases, by completing with the grade of A an upper-division course given entirely in the language.

The Ph.D. program in German literature requires that a student who concentrates research in a period before 1700 know or learn Latin. Each student will be required to take a two-course sequence consisting of a cultural history of the German language and an introduction to Middle High German. Equivalent work done elsewhere

will be counted toward a fulfillment of the requirement.

The Ph.D. program in comparative literature requires 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

As students participate in seminars they are encouraged to move toward the second stage of their preparation for advancement to candidacy. During this stage, students in consultation with their advisers choose three areas of specialization: (1) a literary or critical genre or mode; (2) an historical period; (3) an author of major significance within the national literature of the students' primary focus. A problem of critical theory or interdisciplinary study may be substituted for one of the three. The areas should not overlap.

Students choose one of the three areas of specialization to be the subject of the Long Paper, which forms the main focus of preparation for candidacy. Prepared in consultation with appropriate faculty members, the Long Paper is a piece of scholarly research or theoretical analysis demonstrating intellectual and analytical acumen. In addition to the Long Paper, two research reports representing the other areas of specialization are required. These are expected to demonstrate a command of scholarship as such. The reports and the Long Paper are accompanied by a critical and selective, but comprehensive bibliography of primary and secondary source materials. In either the Long Paper or one of the research reports there must be a comparatist component representing research into the subject beyond the boundaries of the national literature of primary specialization. When these papers are deemed acceptable, a two-hour oral doctoral examination takes place centering on, but not limited to, the subjects of the papers.

Beyond the Long Paper there is an alternative way to proceed. The student may choose to be examined in the other two areas in two three-hour examinations. Afterwards comes the two-hour oral examination, as above. On passing the

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—often incorporating the Long Paper—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 discussion sections and related activities in a variety of freshman and sophomore courses, with the guidance and support of a supervising professor. Academic credit is granted for the training given under the apprentice teaching program.

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 eight years.

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 graduate study with the aim of proceeding to the Ph.D. and who decide to qualify for a master's degree. The M.A. degree is currently available in five fields: English/American, 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. The department does not offer financial support for M.A. candidates.

Students may enter the M.A. program in fall, winter, or spring quarter. Completed applications and supporting materials must be received at least two months before the beginning of the quarter in which the applicant proposes to begin study. 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, in the context of which at least three seminar papers

must be written. For students in the comparative literature section, one of these papers must demonstrate knowledge of a language other than that of their principal concentration.

2. Eight additional units of graduate seminars, upper-division courses, and/or guided independent study, in the context of which at least one further paper must be written. 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 or 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. Students in the comparative literature section 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.

4. Eight units of guided research, culminating in an acceptable master's thesis or master's examination.

RESEARCH RESOURCES

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 (the editor and publisher), 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. Students also have access, facilitated by travel grants, to all other University of California research collections.

Courses

NOTE: A LIST OF SPECIFIC COURSE OFFERINGS (WITH NAMES OF INSTRUCTORS FOR THE 1990-91 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 TWO 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.

Lit/Ch 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.

Lit/Ch 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.*

Lit/Ch 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.

Lit/Ch 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.

Lit/Ch 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.

Lit/Ch 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.*

Lit/Ch 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

Lit/Co 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.

Lit/Co 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.

Lit/Co 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.

Lit/Co 221. Renaissance Studies (4)

One or more major writers, texts, or trends of European Renaissance. May be repeated for credit as topics vary.

Lit/Co 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.

Lit/Co 231. Eighteenth-Century Studies (4)

One or more major writers, texts, or trends of eighteenth-century European literature. May be repeated for credit as topics vary.

Lit/Co 241. Romanticism (4)

A study of the romantic movement in various national literatures. May be repeated for credit as topics vary.

Lit/Co 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.

Lit/Co 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.

Lit/Co 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.

Lit/Co 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.)

Lit/Co 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.

Lit/Co 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.

Lit/Co 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.*

Lit/Co 296. Research Practicum (1-12)

Laboratory research on special topics under the direction of individual faculty members. May be taken by individuals or small groups. Offered for repeated registration. (S/U grades only.)

Lit/Co 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of literature. Offered for repeated registration. (S/U grades only.)

LITERATURE

Lit/Co 298. Special Projects (4)

Treatment of special topics in comparative literature. Offered for repeated registration. (S/U grades only.)

Lit/Co 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. (S/U grades only.)

ENGLISH AND AMERICAN LITERATURE

LOWER DIVISION

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 21-22-23. The English Literary Imagination (4-4-4)

Major figures and works in English literature from the Middle Ages to the present day, including *Beowulf*, Chaucer, Spenser, Shakespeare, Milton, Swift, Pope, the Romantics, Tennyson, Browning, Yeats, T. S. Eliot; together with novels by such authors as Fielding, Jane Austen, Dickens, Thackeray, Hardy, and Joyce.

21. *The Middle Ages and the Renaissance*

22. *Neoclassicism and Romanticism*

23. *The Rise of Modernism*

Lit/En 24. The American Literary Imagination (4)

An introduction to American literature, centered mainly on the close reading and interpretation of major writers—with due attention, however, to selected minor writers—so that the student, aided and guided by the lectures, can get a sense of the scope of American literature as a whole and also of its relationship to the course of American social, cultural, and intellectual history.

Lit/En 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.

Lit/En 90. Undergraduate Seminars (1)

Readings and discussions focussed on a writer, period, or literary topic. The aim of the course is to acquaint the student with English and American literatures 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.

Lit/En 105. Old English Literature (4)

A study of Old English poetry and prose. Texts will be read in translation.

Lit/En 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.

Lit/En 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*.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 115A. The Sixteenth Century: Themes and Issues (4)

Selected topics concerned with sixteenth-century English literature as a whole.

Lit/En 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.

Lit/En 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.

Lit/En 116. Elizabethan and Jacobean Drama (4)

The study of representative plays from one of the great moments in the history of dramatic literature. Tragedies and comedies primarily by Shakespeare's contemporaries and successors are read in the context of the historical, social, and intellectual background of the period.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 119. Restoration Literature (4)

The literature of a period which saw the reopening of the theatres and the reestablishment of a flourishing dramatic tradition in England. Readings include examples of Restoration comedy and tragedy; the poetry and criticism of John Dryden and others who helped to found a "neoclassical" aesthetic in English literature.

Lit/En 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.

Lit/En 120B. The Age of Pope (4)

Pope, Swift, Addison, Steele, Gay, and their contemporaries.

Lit/En 120C. Samuel Johnson and His Time (4)

Johnson, Boswell, Burke, Goldsmith, and their contemporaries.

Lit/En 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.

Lit/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 when topics vary.

Lit/En 125A. Romanticism: Themes and Issues (4)

Selected topics concerned with the romantic period as a whole.

Lit/En 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.

Lit/En 125C. Second Generation Romantic Poets (4)

Byron, Keats, Shelley, and their contemporaries.

Lit/En 125D. Romantic Prose (4)

Romantic critical theory and imaginative writing in prose.

Lit/En 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.

Lit/En 125F. Byron and Byronism (4)

Lord Byron's life, works, and cultural impact, including an examination of some later authors, such as Carlyle and the Brontes, who responded to Byron through their own writings.

Lit/En 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.

Lit/En 127A. The Victorian Period: Themes and Issues (4)

Selected topics concerned with Victorian literature as a whole.

Lit/En 127B. Victorian Poetry (4)

Tennyson, Browning, Arnold, Clough, Hopkins, and their contemporaries.

Lit/En 127C. Victorian Nonfictional Prose (4)

Carlyle, Mill, Newman, Arnold, Ruskin, Pater.

Lit/En 127G. The Nineties: Decade of Decadence (4)

The literature and culture of a period when the British Empire was at its height, while writers and artists expressed attitudes ranging from jingoism, through obsessive insecurity, to revolution against the philistine values of society.

Lit/En 130A. Modern British Literature: Themes and Issues (4)

Selected topics concerned with modern British literature as a whole.

Lit/En 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.

Lit/En 132. Modern Irish Literature (4)

The Irish Revival and its aftermath: Yeats, Synge, O'Casey, Joyce, Beckett, and their contemporaries.

Lit/En 143. The English Novel: Eighteenth Century (4)

A study of some of the first major novels in English, including such works as *Robinson Crusoe*, *Clarissa*, *Tom Jones*, and *Tristram Shandy*.

Lit/En 144A. English Novel to Mid-Nineteenth Century (4)

Includes such authors as Jane Austen, Walter Scott, Charlotte Bronte, Emily Bronte, and Thackeray, together with early Dickens. *Prerequisite: upper-division standing or consent of instructor.*

Lit/En 144B. English Novel in the Later Nineteenth Century (4)

Includes such authors as the later Dickens, Anthony Trollope, George Eliot, Thomas Hardy and Henry James. *Prerequisite: upper-division standing or consent of instructor.*

Lit/En 145. The English Novel: Modern Period (4)

A study of the English novel in the age of Thomas Hardy, Joseph Conrad, E.M. Forster, Virginia Woolf, D.H. Lawrence, and James Joyce.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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-

ernists, among them Pound, H.D., and Eliot; Hemingway, Stein, and Faulkner; Stevens, Moore, and Williams.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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, such as 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.

Lit/En 175C. New American Prose—Post-World War II to the Present (4)

Reading and interpretation of American writing in such forms as the personal essay, autobiography, cultural and/or critical journalism, and documentary reportage. Lectures will set the appropriate context in sociocultural and literary history. May be repeated for credit as topics vary.

Lit/En 176. Major American Writers (4)

A study in depth of the works of major American writers. May be repeated for credit as topics vary.

Lit/En 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.

Lit/En 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.

Lit/En 180. Chicano Literature in English (4)

An introduction to the literature written in English by the Chicano population, the men and women of Mexican descent who live and write in the United States. The course will primarily focus on the contemporary period, exploring the dominant

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themes, motifs, and forms of expression in representative works in the various genres.

Lit/En 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.

Lit/En 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.

Lit/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.

Lit/En 187. Black Music/Black Texts: Communication and Cultural Expression (4)

Explores roles of music as a traditional form of personal, communal, and political communication among Africans, Afro-Americans, and West-Indians. Special attention given to poetry of black music, blues, improvisational vocal poetry of Jamaican reggae deejays, and other forms of vocal music expressive of contestatory political attitudes in black nations of the Third World.

Lit/En 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.*

Lit/En 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

Lit/En 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.*

Lit/En 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.) *Prerequisites: permission of department and upper-division standing.*

GRADUATE

Lit/En 211A-B. Old English Literature (4-4)

Lit/En 211A is a study of Old English language, forms and syntax, and a reading of some prose and verse. Lit/En 211B is a study of Old English poetry.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 226. Shakespeare (4)

Shakespeare's plays in relation to the Elizabethan background; selected major texts. May be repeated for credit as topics vary.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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.

Lit/En 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. (S/U grades only.)

Lit/En 295. M.A. Thesis (1-8)

Research for the master's thesis. Opened for repeated registration. (S/U grades only.)

Lit/En 296. Research Practicum (1-12)

Laboratory research on special topics under the direction of individual faculty members. May be taken by individuals or small groups. Offered for repeated registration. (S/U grades only.)

Lit/En 297. Directed Studies (1-12)

Guided, supervised reading in a broad area of English and American literature. Offered for repeated registration. (S/U grades only.)

Lit/En 298. Special Projects (4)

Treatment of a special topic in English and American literature. Offered for repeated registration. (S/U grades only.)

Lit/En 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisite: advancement to candidacy for the Ph.D. degree.* (S/U grades only.)

■ FRENCH LITERATURE

LOWER DIVISION

Language and Literature Courses

Ordinarily, students entering the French literature program elect the following sequence: Lit/Fr 2A, 2B, and 50.

Lit/Fr 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: Lit/Fr 2A-Lit/French 33/53, 1C/1CX or its equivalent; Lit/Fr 2B-Lit/Fr 2A or its equivalent, Lit/Fr 50-Lit/Fr 2B or its equivalent.*

Lit/Fr 2C. French Composition (4)

A course in intensive French composition for students who wish to raise the quality of their written French to the level required in upper-division French literature courses.

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor. All upper-division courses are taught in French. Additional prerequisites may be specified below.

Lit/Fr 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: Lit/Fr 50.*

Lit/Fr 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: Lit/Fr 50.*

Lit/Fr 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.

Lit/Fr 122. Seventeenth Century (4)

Major literary works of the seventeenth century. May be repeated for credit as topics vary.

Lit/Fr 123. Eighteenth Century (4)

Major literary works and problems of the eighteenth century. May be repeated for credit as topics vary.

Lit/Fr 124. Nineteenth Century (4)

Major literary works of the nineteenth century. May be repeated for credit as topics vary.

Lit/Fr 125. Twentieth Century (4)

Major literary works and problems of the twentieth century. May be repeated for credit as topics vary.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.*

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Literature/Gen 191. Oral exam.

Lit/Fr 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.*

Lit/Fr 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

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 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.

Lit/Fr 225. Twentieth-Century French Literature (4)

Selected topics in modern French literature and thought. May be repeated for credit as topics vary.

Lit/Fr 240. Topics in French Literature (4)

An examination of one or more major topics in French literature.

Lit/Fr 260. Poetic Analysis (4)

Through the examination of a group of texts that transcends the boundaries of historical periodization, this course will emphasize the methods and techniques of poetic analysis. The particular attention given to one or several approaches to the text—formal, thematic, textual, etc.—as well as the specific composition of the corpus of texts to be studied will vary with each instructor of the course. In every case, however, the focus will be on the assimilation of a method and the mastery of a specific technique of reading poetic texts rather than on their content or on the historical continuity of their themes or forms.

Lit/Fr 295. M.A. Thesis (1-8)

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

Lit/Fr 296. Research Practicum (1-12)

Laboratory research on special topics under the direction of individual faculty members. Can be taken by individuals or small groups. Offered for repeated registration. (S/U grades only.) *Prerequisite: consent of the instructor.*

Lit/Fr 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of French literature. Offered for repeated registration. (S/U grades only.) *Prerequisite: consent of the instructor.*

Lit/Fr 298. Special Projects (4)

Treatment of a special topic in French literature. Offered for repeated registration. (S/U grades only.) *Prerequisite: consent of the instructor.*

Lit/Fr 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisite: student must be advanced to candidacy for the Ph.D. degree.* (S/U grades only.)

■ 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

Lit/Gen 4A-B-C-D-E-F. Fiction and Film in Twentieth-Century Societies (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/Japanese

Lit/Gen 6A-B-C. Understanding Literature: Fiction, Poetry, and Drama (4-4-4)

An introduction to the reading, interpretation, and appreciation of literature, according to the major genres, and corresponding to the three quarters of the academic year. There is a varying emphasis on themes and techniques in selected works from different periods and cultures.

- 6A. Fiction
- 6B. Poetry
- 6C. Drama/Comedy

Lit/Gen 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.

ThrWld 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

Lit/Gen 100. The Classical Tradition (4)

Greek and Roman literature in translation. May be repeated for credit as topics vary.

LITERATURE

Lit/Gen 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.

Lit/Gen 102. Literature of the Renaissance (4)

A study of literary/humanistic texts from various cultures involved in the European Renaissance.

Lit/Gen 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.

Lit/Gen 105. Studies in 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.

Lit/Gen 106A-B-C. The Rise of Christianity (4-4-4)

A study of the origins and development of Christian thought, history, literature, and institutions during the formative period from the birth of Jesus to the Middle Ages. The first quarter is devoted to the background in post-biblical Judaism and pagan religions during the early Roman Empire. The second quarter focuses on New Testament literature, the early Fathers, and the history of the church in the Ante-Nicene period (A.D. 325). The third concentrates on the impact of Christianity on Western Europe during the Middle Ages and the fusion of Christian and pagan cultures in the Latin, Germanic, and Celtic traditions. Satisfies the minor in the Humanities Program.

Lit/Gen 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. *Prerequisite: upper-division standing or consent of instructor.*

110A—1800–1860

110B—1860–1917

110C—1917–present

Lit/Gen 111. Nineteenth-Century Russian Literature (4)

A study of literary works from the nineteenth century. May be repeated for credit when topics vary.

Lit/Gen 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. *Prerequisite: upper-division standing or consent of instructor.*

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 121. Dante in Translation (4)

Divine Comedy with an emphasis on Dante's relation to the courtly love lyric and to the institutions of learning of his time.

Lit/Gen 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.

Lit/Gen 123. Women in Italy (4)

A study of historical, political, and literary texts regarding women and feminism in Italian society.

Third World Literature in Translation

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 135. Contemporary Caribbean Literature (4)

This course will focus mainly on contemporary literature of the English-speaking Caribbean as a Third World area of experience. The parallels and contrasts of this literature with that of the Spanish- and French-speaking Caribbean will also be explored.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 155. Hebrew Literature: The Modern Period (4)

Selected topics in modern Hebrew literature.

Lit/Gen 156. Topics in the Prophets (4)

Study of a single book, period, or issue in the biblical prophets.

Lit/Gen 157. Topics in Biblical Narrative (4)

Study of a single book, period, or issue in the narrative books of the Bible.

Lit/Gen 158. Topics in Biblical Poetry (4)

Study of a single book, period, or issue in the poetic books of the Bible.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 163. The Drama (4)

Aspects of the drama, not confined to a single national literature. Texts may be read in English. May be repeated for credit as topics vary.

Lit/Gen 164. Lyric Poetry (4)

Studies in lyric poetry. Not confined to a single national literature. Texts may be read in English.

Lit/Gen 165. Comedy (4)

Comedy in fiction and film from ancient times to contemporary, including the Bible, Aristophanes, Shakespeare, and modern writers and film makers.

Lit/Gen 166. The Forms of Folklore (4)

A survey of the range of folkloristic phenomena as exemplified by major and minor forms—narrative, legend, myth, supersti-

tion, speech, custom, games, and music. Examples will be considered both as artistic entities and as social documents.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 173. Contemporary Literature (4)

A study of novels and authors of the present and recent times. May be repeated for credit as topics vary.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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 film.

Lit/Gen 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.

Lit/Gen 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*.

Lit/Gen 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.

Lit/Gen 180. Visual Arts and Literature (4)

An investigation into themes and styles common to literature and visual arts. May be repeated for credit as topics vary.

Lit/Gen 181. Mythology (4)

A study of various bodies of myth: their content, form, and meaning. May be repeated for credit as topics vary.

Lit/Gen 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.

Lit/Gen 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. *Prerequisite: upper-division standing or consent of instructor.*

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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**Lit/Gen 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.*

Lit/Gen 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.)

LITERATURE

Lit/Gen 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.

Lit/Gen 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

Lit/Gen 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.*

Lit/Gen 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.*

Lit/Gen 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. (S/U grades only.)

Lit/Gen 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. (S/U grades only.)

Lit/Gen 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. (S/U grades only.)

Lit/Gen 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. (S/U grades only.)

Lit/Gen 504. Apprentice Teaching in Warren College (4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Warren College courses under the super-

vision 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. (S/U grades only.)

Lit/Gen 505. Seminar on Teaching in the Humanities (4)

A seminar for teaching assistants in the Revelle Humanities/Writing Program. Graduate students appointed to teaching Humanities during the winter and spring quarters must enroll in this seminar during the preceding fall quarter. The course involves the study of major humanistic texts used in the Humanities/Writing Program and the development of interpretive strategies and pedagogical tactics appropriate for teaching beginning undergraduates to read and write about those texts.

Lit/Gen 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. (S/U grades only.)

■ GERMAN LITERATURE

LOWER DIVISION

Language and Literature Courses

Lit/Gen 2A. Readings and Interpretations (4)

This course is taught entirely in German and emphasizes the development of reading ability, listening comprehension, and writing skills. It includes grammar review, lectures, and class discussion. Approximately half of the reading selections are from modern and classical authors, half from nonliterary disciplines—humanities, social sciences, pure and applied sciences. The course is designed to prepare students for Literature 2B and Literature 2C. For information on prerequisites, contact the Undergraduate Office of the Department of Literature. Successful completion of Lit. 2A satisfies the requirement for language proficiency in Revelle College.

Lit/Gen 2B. Advanced Readings and Interpretations (4)

Continuation of German 2A for those students who intend to practice their reading abilities, listening comprehension, and writing skills on a more advanced level. *Prerequisite: Lit/Gen 2A or consent of instructor.*

Lit/Gen 2C. Composition and Conversation (4)

A course designed for students who wish to improve their ability to speak and write German. *Prerequisite: Lit/Gen 2B or equivalent or consent of instructor.*

Lit/Gen 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 Lit/Gen 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 Lit/Gen 51-52-53-54 sequence before being admitted to upper-division courses. Additional prerequisites may be specified below.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 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.

Lit/Gen 125. Nineteenth-Century German Literature (4)

Major literary works, authors, or movements of the nineteenth century. May be repeated for credit as topics vary.

Lit/Gen 126. Twentieth-Century German Literature (4)

Major literary works, authors, or movements of the twentieth century. May be repeated for credit as topics vary.

Lit/Gen 130. German Literary Prose (4)

The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

Lit/Gen 131. German Dramatic Literature (4)

The development of the drama in Germany. May be repeated for credit as topics vary.

Lit/Gen 132. German Poetry (4)

The development of major forms and modes of German verse. May be repeated for credit as topics vary.

Lit/Gen 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.

Lit/Gen 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. *Prerequisite: upper-division standing or consent of instructor.*

Lit/Gen 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.

Lit/Gen 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.

Lit/Ger 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Ger 191. Oral exam.

Lit/Ger 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: special permission of department.*

Lit/Ger 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**Lit/Ger 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.

Lit/Ger 203. Cultural History of the German Language (4)

Philological survey of the German language with particular attention to historical, cultural, and social interrelations.

Lit/Ger 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.

Lit/Ger 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.

Lit/Ger 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.

Lit/Ger 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.

Lit/Ger 241. German Romanticism (4)

Studies in the prose, poetry, and theoretical writings of German romantics. May be repeated for credit as topics vary.

Lit/Ger 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.

Lit/Ger 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.

Lit/Ger 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.

Lit/Ger 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.

Lit/Ger 273. Literature and Art (4)

An investigation into themes and styles common to literature and visual arts. May be repeated for credit as topics vary.

Lit/Ger 295. M.A. Thesis (1)

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

Lit/Ger 296. Research Practicum (1-12)

Laboratory research on special topics under the direction of individual faculty members. Can be taken by individual or small groups. Offered for repeated registration. (S/U grades only.)

Lit/Ger 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of German literature. Offered for repeated registration. (S/U grades only.)

Lit/Ger 298. Special Projects (4)

Treatment of a special topic in German literature. Offered for repeated registration. (S/U grades only.)

Lit/Ger 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisite: student must be advanced to candidacy for the Ph.D. degree.* (S/U grades only.)

■ GREEK LITERATURE**LOWER DIVISION****Lit/Gk 1. Beginning Greek (4)**

Study of ancient Greek, including grammar and reading.

Lit/Gk 2. Intermediate Greek (I) (4)

Continuation of study of ancient Greek, including grammar and reading. *Prerequisite: Lit/Gk 1 or equivalent.*

Lit/Gk 3. Intermediate Greek (II) (4)

Continuation of study of ancient Greek, including grammar and reading of texts. *Prerequisites: Lit/Gk 1 and 2 or equivalent.*

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/Gk 100. Introduction to Greek Literature (4)

Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: Lit/Gk 3 or equivalent.*

Lit/Gk 101. Advanced Grammar and Prose Composition (4)

Advanced Greek grammar and/or prose composition. *Prerequisite: Lit/Gk 100.*

Lit/Gk 110. Archaic Period (4)

Readings, in Greek, of texts from the archaic period. May be repeated for credit as topics vary.

Lit/Gk 112. Homer (4)

Readings from the works of Homer. Repeatable for credit when texts and material vary.

Lit/Gk 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.

Lit/Gk 118. Hellenistic Period (4)

Readings, in Greek, of texts from the Hellenistic period. May be repeated for credit as topics vary.

Lit/Gk 120. New Testament Greek (4)

Readings, in Greek, in the Greek New Testament. May be repeated for credit as topics vary.

Lit/Gk 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.

Lit/Gk 131. Comedy (4)

Readings, in Greek, of one or more of the works of Aristophanes. May be repeated for credit as topics vary.

Lit/Gk 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.

Lit/Gk 133. Prose (4)

Readings, in Greek, in the works of ancient prose writers. May be repeated for credit as topics vary.

Lit/Gk 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.

Lit/Gk 135. Lyric Poetry (4)

Readings, in Greek, of the works of the ancient lyric poets. May be repeated for credit as topics vary.

Lit/Gk 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.

Lit/Gk 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.*

Lit/Gk 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**Lit/Gk 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of Greek literature. Offered for repeated registration. (S/U grades only.)

Lit/Gk 298. Special Projects (4)

Treatment of a special topic in Greek literature. Offered for repeated registration. (S/U grades only.)

■ HEBREW LITERATURE**UPPER DIVISION**

Prerequisite: upper-division standing or consent of instructor.

Lit/Heb 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.

Lit/Heb 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.

Lit/Heb 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.

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Lit/Heb 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.

Lit/Heb 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.

Lit/Heb 155. Hebrew Literature: The Modern Period (4)

Selected topics in modern Hebrew literature.

Lit/Heb 156. Topics in the Prophets (4)

Study of a single book, period, or issue in the biblical prophets.

Lit/Heb 157. Topics in Biblical Narrative (4)

Study of a single book, period, or issue in the narrative books of the Bible.

Lit/Heb 158. Topics in Biblical Poetry (4)

Study of a single book, period, or issue in the poetic books of the Bible.

Lit/Heb 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. *Prerequisite: upper-division standing or consent of instructor.*

Lit/Heb 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.*

Lit/Heb 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:

Lit/Heb 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

Lit/Heb 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Hebrew literature. Offered for repeated registration. (S/U grades only.)

Lit/Heb 298. Special Projects (4)

Treatment of a special topic in Hebrew literature. Offered for repeated registration. (S/U grades only.)

ITALIAN LITERATURE

LOWER DIVISION

See Department of Linguistics for course offerings in first-year Italian.

Lit/It 2A. Advanced Italian (I) (4)

A second-year course in Italian language and literature. Conversation, composition, grammar reviews, and an introduction to literary and nonliterary texts. *Prerequisite: Lit/It 1C or equivalent or consent of instructor.*

Lit/It 2B. Advanced Italian (II) (4)

Emphasis on composition discussion of literary texts in Italian. *Prerequisite: Lit/It 2A or equivalent or consent of instructor.*

Lit/It 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: Lit/It 2A and 2B, or consent of instructor.*

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/It 100. Introduction to Italian Literature (4)

Reading and discussion of selections from representative authors. Review of grammar as needed. *Prerequisite: Lit/It 2B or equivalent or consent of instructor.*

Lit/It 110. Italian Literature (4)

One or more periods of authors in Italian literature. May be repeated for credit as topics vary.

Lit/It 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.

Lit/It 115. Dante in Translation (4)

Divine Comedy with an emphasis on Dante's relation to the courtly love lyric and to the institutions of learning of his time.

Lit/It 122. Studies in Modern Italian Culture (4)

Politics, literature, and cultural issues of twentieth-century Italy.

Lit/It 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.

Lit/It 137. Studies in Modern Italian Prose (4)

A study of the chief modern Italian *prosatori* including D'Annunzio, Calvino, Pavese, Pasolini, etc.

Lit/It 140. Women in Italy (4)

A study of historical, political, and literary texts regarding women and feminism in Italian society.

Lit/It 161. Advanced Stylistics and Conversation (4)

Analysis of Italian essays, journalism, literature. Intensive practice in writing and Italian conversation. *Prerequisite: Lit/It 100 or consent of instructor.*

Lit/It 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.*

Lit/It 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.*

Lit/It 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

Lit/It 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Italian literature. Offered for repeated registration. (S/U grades only.)

Lit/It 298. Special Projects (4)

Treatment of a special topic in Italian literature. Offered for repeated registration. (S/U grades only.)

LATIN LITERATURE

LOWER DIVISION

Lit/La 1. Beginning Latin (4)

Study of Latin, including grammar and reading.

Lit/La 2. Intermediate Latin (I) (4)

Study of Latin, including grammar and reading. *Prerequisite: Lit/La 1 or its equivalent.*

Lit/La 3. Intermediate Latin (II) (4)

Study of Latin, including grammar and reading. *Prerequisite: Lit/La 2 or its equivalent.*

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/La 100. Introduction to Latin Literature (4)

Reading and discussion of selections from representative authors of the Augustan age. Review of grammar as needed. *Prerequisite: Lit/La 3 or equivalent.*

Lit/La 101. Advanced Grammar and Composition (4)

Advanced Latin grammar and/or prose composition. May be repeated for credit when course material varies.

Lit/La 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.

Lit/La 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.

Lit/La 113. Augustan (4)

Readings, in Latin, in the works of Roman writers of the Augustan period. May be repeated for credit as topics vary.

Lit/La 114. Vergil (4)

Readings from the works of Vergil. Repeatable for credit when texts and material vary.

Lit/La 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.

Lit/La 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.

Lit/La 124. Medieval Latin (4)

Readings, in Latin, in the works of the medieval period. May be repeated for credit as topics vary.

Lit/La 126. Renaissance Latin (4)

Readings, in Latin, in the works of the Renaissance period. May be repeated for credit as topics vary.

Lit/La 130. The Novel (4)

Readings, in Latin, in the works of the Latin novelists. May be repeated for credit as topics vary.

Lit/La 131. Prose (4)

Readings, in Latin, of the work of Roman prose writers. May be repeated for credit as topics vary.

Lit/La 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.

Lit/La 133. Epic (4)

Readings, in Latin, in the works of Roman epic poets. May be repeated for credit as topics vary.

Lit/La 134. History (4)

Readings, in Latin, in the works of Roman historians. May be repeated for credit as topics vary.

Lit/La 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.

Lit/La 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.

Lit/La 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**Lit/La 297. Directed Studies (1-12)**

Guided and supervised reading in a broad area of Latin literature. Offered for repeated registration. (S/U grades only.)

Lit/La 298. Special Projects (4)

Treatment of a special topic in Latin literature. Offered for repeated registration. (S/U grades only.)

RUSSIAN LITERATURE**LOWER DIVISION****Lit/Ru 1A-B-C. First-Year Russian (4-4-4)**

First-year Russian, with attention to reading, writing, and speaking.

Lit/Ru 2A-B-C. Second-Year Russian (4-4-4)

Second-year Russian grammar, with attention to reading, writing, and speaking. *Prerequisite:* Ling/Ru 33/53, Lit/Ru 1A-B-C or equivalent.

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/Ru 101A-B-C. Advanced Russian (4-4-4)

Third-year Russian. Advanced grammar and stylistics, introduction to analysis of Russian literary texts.

Lit/Ru 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. *Prerequisite:* upper-division standing or consent of instructor. Lit/Ru 110A is not a prerequisite for Lit/Ru 110B and Lit/Ru 110B is not a prerequisite for Lit/Ru 110C.

110A—1800–1860

110B—1860–1917

110C—1917–present

Lit/Ru 123. Single Author in Russian Literature (4)

Study of the works of a single Russian author. May be repeated for credit two times. *Prerequisite:* Lit/Ru 101C, its equivalent, or permission of instructor.

Lit/Ru 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:* Lit/Ru 101C, its equivalent, or permission of instructor.

Lit/Ru 129. Twentieth-Century Russian or Soviet Literature in Translation (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.

Lit/Ru 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.

Lit/Ru 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:* Lit/Ru 101C, its equivalent, or permission of instructor.

Lit/Ru 132. Russian Poetry (4)

Survey of Russian poetry from the late eighteenth century to the Revolution. *Prerequisite:* Lit/Ru 101C, its equivalent, or permission of instructor.

Lit/Ru 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:* Lit/Ru 101C, its equivalent, or permission of instructor.

Lit/Ru 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.

Lit/Ru 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.

Lit/Ru 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****Lit/Sp 2A. Readings and Composition (4)**

The course is taught entirely in Spanish and emphasizes the development of reading ability, listening, comprehension, and

writing skills. It includes intensive grammar review, weekly compositions, and class discussions. The course is designed to prepare students for Lit/Sp 2B and 2C. *Prerequisite:* basic language proficiency (550 plus oral interview) or completion of Ling 33/53 or 1C/1CX. Successful completion of Lit/Sp 2A satisfies the requirement for language proficiency in Revelle College.

Lit/Sp 2B. Readings and Interpretations (4)

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 Lit/Sp 2A. *Prerequisite:* Lit/Sp 2A or consent of instructor.

Lit/Sp 2C. Cultural Readings and Composition (4)

This course is a continuation of Lit/Sp 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:* Lit/Sp 2B or equivalent. (Numbered 40 prior to fall 1989.)

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

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Lit/Sp 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*.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 119. Cervantes (4)

A close study of the *Quijote*. In alternate years Cervantes' other prose works and his theatre will be studied. (Required of all majors.)

Lit/Sp 120. Major Works in the Modern Period: from Feljoo 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.

Lit/Sp 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.

Lit/Sp 124. The Nineteenth-Century Novel (4)

Study of major novelists of the realist tradition. Selection of works and thematic focus may vary.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 134. Argentine Literature (4)

Study of movements, traditions, key authors, or major trends in Argentine literature, such as gaucho poetry, the realist novel, modern urban narrative, the school of Jorge Louis Borges. May be repeated for credit as topics vary.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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. This course may be offered in English.

Lit/Sp 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.

Lit/Sp 152. Chicano Prose (4)

A study of the different genres of Chicano prose, essay, novel, short story, autobiography. Attention is given to the development of Chicano prose styles and the historical and cultural movement in which these forms develop.

Lit/Sp 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.

Lit/Sp 154. Chicano Theatre (4)

This course provides students a meaningful definition of Chicano theatre through the discussion and interpretation of major dramatic works, both past and present.

Lit/Sp 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.

Lit/Sp 161. Spanish Syntax and Morphology (4)

An analysis of Spanish syntax and morphology to increase the student's ability to speak and write Spanish.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 165. History of the Spanish Language (4)

Historical description of Spanish phonology, morphology, and syntax based on readings of the different periods.

Lit/Sp 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.

Lit/Sp 170. Literary Criticism (4)

The course will discuss major contemporary critical approaches and the question of their applicability to the analysis of contemporary Latin America, Peninsular, and Chicano literature.

Lit/Sp 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.

Lit/Sp 172. Indigenista Themes in Spanish American Literature (4)

Study of the varying literary modes during the nineteenth and twentieth centuries by which 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral Exam.

Lit/Sp 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.*

Lit/Sp 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**Lit/Sp 201. Reading Medieval Texts (4)**

Introduction to the reading of medieval Spanish. It will provide the student the linguistic and culture background necessary to go on to more work in depth in the medieval field. May be repeated for credit as topics vary.

Lit/Sp 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.

Lit/Sp 203. History of the Spanish Language (4)

Readings and discussion in the monographic literature of a selected topic.

Lit/Sp 208. Textual Criticism in Spanish (4)

Tools and methods of scholarly research in literature for establishing texts from both manuscript and printed sources.

Lit/Sp 214. Studies in Medieval Literature (4)

Consideration of one or more major figures, texts, trends, or problems in medieval Spanish literature.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 226. Cervantes (4)

A critical reading of the *Quijote*.

Lit/Sp 231. Eighteenth-Century Spanish Literature (4)

Consideration of one or more major figures, texts, trends, or problems in eighteenth-century Spanish literature. May be repeated for credit as topics vary.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 254. Modern Spanish Poetry (4)

An historical approach to modern Spanish poetry. May be repeated for credit as topics vary.

Lit/Sp 255. The Modern Spanish Novel (4)

An historical approach to the modern Spanish novel. May be repeated for credit as topics vary.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.

Lit/Sp 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.)

Lit/Sp 295. M.A. Thesis (1-8)

Research for the master's thesis. Open for repeated registration up to eight units. (S/U grades only.)

Lit/Sp 296. Research Practicum (1-12)

Laboratory research on specific topics to be developed by a small group of students under the continued direction of individual faculty members. Offered for repeated registration.

Lit/Sp 297. Directed Studies (1-12)

Guided and supervised reading in a broad area of Spanish literature. Offered for repeated registration. (S/U grades only.)

Lit/Sp 298. Special Projects (4)

Treatment of a special topic in Spanish literature. Offered for repeated registration. (S/U grades only.)

Lit/Sp 299. Thesis (1-12)

Research for the dissertation. Offered for repeated registration. *Prerequisites: advancement to candidacy for the Ph.D. degree.* (S/U grades only.)

THEORY/LITERATURE

The Department of Literature has always taught courses in literary theory, but has listed them in the individual sections. Beginning in 1989-90, these courses were given their own listing in the catalog. This was done to feature literary theory as a discipline and to provide a more orderly arrangement of the department's offerings in this field.

UPPER DIVISION

Prerequisite: upper-division standing or consent of instructor.

Lit/Th 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.

Lit/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 when topics vary.

Lit/Th 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.

Lit/Th 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

Lit/Th 200A-B-C. Foundations of Literary and Cultural Criticism (4-4-4)

This sequence is required of and limited to all first-year Ph.D. candidates. Its aim is to acquaint students with the scope and possibilities of advanced literary and cultural studies as understood by the department in particular and the profession in general. Although supervised by a single member of the department, each course will have guest instructors from within and without the department.

200A. From Text to Textuality (4)

Bibliographical method, modern textual methods, modern philology, the history of writing, forms of close-reading, etc.

200B. Problems in Contemporary Literary Theory (4)

Structuralism and post-structuralism, reception theory, semiotics, literature and linguistics, the historicisms, Russian formalism, psychoanalysis, etc.

200C. Cultural Perspectives and Cultural Criticism (4)

Literature in the First, Second, and Third Worlds, ethnicity and literature, gender criticism, canon formation, orality and literacy, etc.

Lit/Th 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.

Lit/Th 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.

Lit/Th 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.

Lit/Th 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.

■ WRITING/LITERATURE

Departmental approval is required for enrollment in all writing/literature courses.

LOWER DIVISION

Lit/Writing 8A-B-C. The Craft of Writing (4-4-4)

A study of major literary genres from the standpoint of craft and formal structure. Students will learn basic techniques of literary composition (prosody, metrics, narration, personification, rhetoric, argument, dialogue) by studying traditional and modern examples of fiction, poetry, and nonfictional prose. An important component will be application of this information through practical exercises, imitations, and parodies. These courses are prerequisite to any upper-division writing workshop in a given genre.

8A *The Craft of Fiction*

8B *The Craft of Poetry*

8C *The Craft of Nonfictional Prose*

UPPER DIVISION

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, Drama, Poetry

Lit/Writing 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 repeated for credit twice. *Prerequisite: Lit/Writing 8A.*

Lit/Writing 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 repeated for credit twice. *Prerequisite: Lit/Writing 8B.*

Lit/Writing 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.

Lit/Writing 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.

Lit/Writing 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 repeated for credit two times.

Lit/Writing 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.

Lit/Writing 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 repeated for credit two times.

Lit/Writing 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 repeated for credit two times.

Lit/Writing 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 3,000 words. May be repeated for credit one time.

Nonfiction Prose

Lit/Writing 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: Lit/Writing 8C.*

Lit/Writing 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: Lit/Writing 8C.*

Lit/Writing 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: Lit/Writing 8C.*

Lit/Writing 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: Lit/Writing 8C.*

Lit/Writing 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: Lit/Writing 8C.*

Lit/Writing 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: Lit/Writing 8C.*

Lit/Writing 127. General Nonfiction Prose Workshop (2)

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: Lit/Writing 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.

Lit/Writing 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.

Lit/Writing 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.

Lit/Writing 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.

Lit/Writing 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.

Lit/Writing 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

Lit/Writing 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.*

Lit/Writing 196. Honors Thesis (4)

Senior thesis research and writing for students who have been accepted for the Literature Honors Program and who have completed Lit/Gen 191. Oral exam.

Lit/Writing 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.

Lit/Writing 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

Lit/Writing 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.

Lit/Writing 272. Research on Composing and Written Discourse (4)

This course will survey current research and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

Lit/Writing 273. Practicum on Research in Composing and Written Discourse (4)

In this course students will design and carry out research studies. Emphasis will be placed on research which can contribute to a theoretical understanding of the writing process.

Lit/Writing 274. Classical and Medieval Rhetoric (4)

This course will trace developments and philosophical perspectives in classical Greek and Roman rhetoric and in rhetoric in medieval Europe. The reading will include works of Plato, Aristotle, Cicero, Quintilian, Longinus, St. Augustine, and Geoffrey of Vinsauf.

Lit/Writing 275. Rhetoric from 1500 to the Present (4)

This course will begin with a brief review of the Greco-Roman background and proceed through the rhetorical theories of Erasmus, Ramus, Wilson, Sydney, and Bacon to the eighteenth century rhetoricians Vico, Blair, Campbell, and Whately. It will continue with Coleridge and DeQuincy in the nineteenth century and conclude with Kenneth Burke in the twentieth century. *Lit/Writing 274, although recommended, is not a prerequisite.*

THE MAKING OF THE MODERN WORLD

OFFICE: Fifth College, Bldg. 412 Matthews Administrative and Academic Complex

The six-course sequence on the Making of the Modern World, required of all Fifth College students, is designed to encourage students to think historically, comparatively, and in an interdisciplinary manner about both Western and non-Western cultures. Disciplinary perspectives include literature, history, philosophy, anthropology, sociology, political science, and fine arts. Students will examine and interpret primary documents and artifacts from diverse eras and cultures, as well as learning 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 abso-

lutist 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, decolonialization, 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)

Assistant Professors

- Atul Chokshi, Ph.D., *AMES*
- John E. Crowell, Ph.D., *Chemistry*
- Frances Hellman, Ph.D., *Physics*
- Karen L. Kavanagh, Ph.D., *ECE*
- John B. Kosmatka, Ph.D., *AMES*
- Joanna McKittrick, Ph.D., *AMES*
- Jan Talbot, Ph.D., *AMES*
- Kenneth S. Vecchio, Ph.D., *AMES*

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 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 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 the 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 five courses:
 - (1) Physics 152 or MS 227; (2) MS 201A;
 - (3) MS 201B; (4) MS 201C; (5) MS 205A.
 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 selected from an approved list of graduate courses with the consent of a faculty adviser.
5. Either complete a thesis (Plan I) or pass a comprehensive examination (Plan II) as described in the "Graduate Studies" section of this catalog.
6. 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.

MATERIALS SCIENCE

OFFICE: Student Affairs Room 4103B, Engineering Bldg., Unit 1, Warren College

Professors

- Siavouche Nemat-Nasser, Ph.D., *AMES, Program Coordinator*
- Gustaf Arrhenius, Ph.D., *SIO*
- Robert J. Asaro, Ph.D., *AMES*
- Ami Berkowitz, Ph.D., *Physics*
- Yuan-Cheng Fung, Ph.D., *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 Andre Meyers, Ph.D., *AMES*
- Stanley Middleman, Ph.D., *AMES*
- David R. Miller, Ph.D., *AMES*
- Johann K. Oesterreicher, Ph.D., *Chemistry*
- Constantin Politis, Ph.D., *Adjunct/ECE*
- M. Lea Rudee, Ph.D., *Dean, Division of Engineering, ECE*
- Ivan K. Schuller, Ph.D., *Physics*
- Massoud Simnad, Ph.D., *Adjunct/AMES*
- Richard Skalak, Ph.D., *AMES*
- Frank E. Talke, Ph.D., *AMES*
- Harry H. Wieder, D.Sc., *ECE*

Associate Professors

- Richard K. Herz, Ph.D., *AMES*
- Hidenori Murakami, Ph.D., *AMES*
- Geert W. Schmid-Schoenbein, Ph.D., *AMES*
- Donald T. Tilley, Ph.D., *Chemistry*
- Charles W. Tu, Ph.D., *ECE*

3. Pass an oral examination to be advanced to candidacy.
4. 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. More typically, the M.S. will probably require four or more quarters. Thus, the normative time is expected to be about five years for the Ph.D. for a normally prepared B.S. student.

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-Grüneisen 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. Solid State Chemistry (4)

Phase diagrams. Crystal structure, X-ray, neutron and electron diffraction. Predictive formalisms for heat of formation. Amorphous materials. Bands vs. bonds. Experimental methods in solid state science. *Prerequisite: consent of instructor.*

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)

Structure/property relationships in ceramic and glass materials. 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 such as SiC, Si₃N₄, ZrO₂ and high temperature superconducting oxide systems. Ceramic-ceramic and ceramic-metal composite technology. Glass formation and structure, phase separation, viscous flow and relaxation. Applications such as glass-ceramic materials, fast-ion conducting glasses, optical waveguides, amorphous semiconductors and thin glassy films and glass-ceramic composites. *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.

MATHEMATICS

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)

■ PHYSICS

Phys. 211. Solid State Physics (5)

Edward A. Bender, Ph.D.

James R. Bunch, Ph.D.

Thomas J. Enright, Ph.D., *Chairman*

John W. Evans, M.D., Ph.D.

Ronald J. Evans, Ph.D.

Jay P. Fillmore, Ph.D., *Vice Chairman*

Carl H. FitzGerald, Ph.D.

Patrick J. Fitzsimmons, Ph.D.

Theodore T. Frankel, Ph.D.

Michael L. Fredman, Ph.D.

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.

Alfred B. Manaster, Ph.D.

Jeffrey B. Remmel, Ph.D.

John A. Rice, 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.

Audrey A. Terras, Ph.D.

Adrian R. Wadsworth, Ph.D.

Nolan R. Wallach, Ph.D.

Stanley G. Williamson, Ph.D.

Daniel E. Wulbert, Ph.D.

Associate Professors

Ian S. Abramson, Ph.D.

Jim Agler, Ph.D.

Norman A. Shenk, Ph.D., *Vice Chairman*

John Wavrik, Ph.D.

Ruth J. Williams, Ph.D.

Senior Lecturers in Mathematics

Patrick J. Ledden, Ph.D., *Provost, Muir College*

Frank B. Thiess, Ph.D.

Assistant Professors

Samuel R. Buss, Ph.D.

Bruce K. Driver, Ph.D.

Jeffrey M. Rabin, Ph.D.

Kevin Walker, Ph.D.

Hans G. Wenzl, 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 designed 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.

The other first-year calculus sequence, Mathematics 2A-2B-2C (or 2AH-2BH-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. Stu-

Professors

Donald W. Anderson, Ph.D., *Dean, Division of Natural Sciences*

Randolph E. Bank, Ph.D.

M. Salah Baouendi, Ph.D.

dents 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.

ACCELERATED CREDIT POLICY

Effective at the end of spring quarter, 1990, the Department of Mathematics will no longer grant accelerated credit for courses that are skipped in the Math. 1 or Math. 2 sequences. Accelerated credit will be granted only if the higher course is taken and passed by July 1, 1990.

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 100-197 may be used as an upper-division elective with the exception of 183 and 195. All courses used to fulfill the major must be taken for a letter grade.

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 (or 2AH), 2B (or 2BH), 2C (or 2CH), 2DA (or 2DH), 2EA (or 2EH), 2F (or 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(or 2DH), 2EA(or 2EH), 2F(or 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 re-

quirements on applied mathematics. See also requirements for all major programs.

All students majoring in applied mathematics are required to complete the following courses:

1. 2A(or 2AH), 2B(or 2BH), 2C(or 2CH), 2DA(or 2DH), 2EA(or 2EH), and 2F(or 2FH) with as many honors classes taken in place of the regular classes as possible.
2. CSE 62AB or CSE 65 or AMES 10.
3. CSE 64 or AMES 154 [students may satisfy (3.) by taking the 170A option in (5.)] Note: UCSD does not give credit for both AMES 10 and CSE 64.
4. 183 or 181A Note: Math. 183 cannot be used toward the 52 required, upper-division units.
5. 102 or 170A
6. One of the following sequences: 180A-B-C (probability), 180A-181A-B (probability and statistics), or any three courses from 170A-B-C, 172, and 173 (numerical analysis).
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.
8. 142A-B (advanced calculus). Students may satisfy this requirement by taking 140A-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. No such units may also be used for a minor or program of concentration.
- b. AMES 154, Econ. 120A-B-C, Math. 183 and 195 cannot be counted toward the fifty-two units.

To be prepared for a strong major curriculum, students should complete Mathematics 2DA(or 2DH), 2EA(or 2EH) before the end of their sophomore year. One of the sequences in (#6) 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 programming 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(or 2AH), 2B(or 2BH), 2C(or 2CH), 2DA(or 2DH), 2EA(or 2EH), and 2F(or 2FH) with as many honors classes taken in place of the regular classes as possible.
2. 89
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 (or 2DH), 2EA (or 2EH), 2F (or 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. (Mathematics 142A-B is not considered an allowed sequence for the purpose of this requirement.) As with the mathematics major, Mathematics 183 and 195 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.

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. 103A-B [0 if Math. 100A-B], Math. 142A-B [0 if Math. 140A-B]
5. Math. 155A [0 if CSE 177], Math. 171A-B [0 if Math. 172A-B]
6. Math. 180A [2 if Econ. 120A or Math. 183 previously/0 if Econ. 120A or Math. 183 concurrently]
7. Math. 181A [2 if Econ. 120A-B/4 if Econ. 120A only]

Credit will be given for only one from each of the following pairs of courses, and either course in a pair may be used to replace a D or F in the other course: Mathematics 2A and 2AH; Mathematics 2B and 2BH; Mathematics 2C and 2CH; 2DA and 2DH; 2EA and 2EH; Mathematics 2F and 2FH.

ADVISERS

Advisers change yearly. Contact the undergraduate office at (619) 534-3590 for the current list.

THE GRADUATE PROGRAM

The department offers graduate programs leading to the M.A., M.S., and Ph.D. degrees.

Admission to the graduate program is in accordance with the general requirements of the graduate division of the University of California. Students with a bachelor's degree and background in mathematics comparable to the requirements for the undergraduate major in mathematics at this university may apply for admission. Applicants must present satisfactory scores on the Graduate Record Examination, including the advanced examination in mathematics.

In each quarter, a student's program must include at least twelve units. At least eight of these units must be in graduate mathematics courses; in addition, these eight units must be taken for a letter grade unless the student has advanced to Ph.D. candidacy. The remaining four units must be in upper-division or graduate courses in mathematics-related subjects or in Mathematics 501. Mathematics 500, Apprentice Teaching, 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 passed both written qualifying examinations (see "Doctoral Degree Program") or who have obtained the approval of the graduate adviser.

MASTER'S DEGREE PROGRAM

Requirements for the master of arts degree are to be met according to Plan II, Comprehensive Examination, as defined by the university. A total of forty-eight units of course credit is required. This must include:

1. At least twenty-four units of graduate mathematics courses.
2. Not more than nine units of upper-division mathematics courses.
3. Not more than twelve units of graduate courses in a related field approved by the department.
4. Not more than four units of Mathematics 500, Apprentice Teaching, or Math. 295. No units of Mathematics 299 may be used in satisfying the requirements for the master's degree. Mathematics 500 may not be used under item 1. Mathematics 501 may be used under item 2.

The comprehensive examination will cover basic facts in two topics, one from each group:

1. Algebra or applied algebra or topology.
2. Real analysis or complex analysis.

The examinations are typically given at the end of June and in mid-September. A detailed list of the depth requirements in each of these areas, with literature references and approved courses, is available in the office of the Department of Mathematics.

A reading knowledge of one foreign language, French, German, or Russian, is required. (In exceptional cases other languages may be substituted.) The foreign language examinations, which consist of the translation of selected passages in mathematics, are administered by the department.

Full-time M.A. students are permitted seven quarters in which to complete all requirements.

MASTER'S DEGREE PROGRAM IN APPLIED MATHEMATICS

The Department of Mathematics also offers an M.A. program in applied mathematics for regular or part-time students. The program requires one to two years for completion. A total of forty-eight units of course credit is required. These must include at least thirty-two units of graduate work, of which at least twenty-four must be graduate courses in mathematics. The remaining required units may be composed of:

1. Approved graduate courses in other departments.
2. No more than eight units of upper-division mathematics courses or Mathematics 501.
3. No more than eight units of approved upper-division courses in other departments.
4. No more than four units of Mathematics 500 (which cannot be used to satisfy graduate course unit requirements).

No units of Mathematics 299 or 295 may be used to satisfy the M.A. requirements. There is no foreign language requirement, and a thesis is not required.

Students must take two sequences and pass two qualifying exams (at the M.A. level) from the following applied mathematics courses: 202A-B-C, 210A-B-C, 261A-B-C, 264A-B-C, 270A-B-C, 271A-B-C, 272A-B-C, 277A-B-C, 282A-B-C. (Not every course is offered each year.) The dates for the qualifying exams for this program vary. Consult with the instructors of the relevant courses.

In addition, students are encouraged to take a one-year graduate sequence in a related area outside the Department of Mathematics (e.g., com-

puter science, engineering, physics, economics). Full-time M.A. students are permitted seven quarters in which to complete all requirements.

MASTER'S DEGREE PROGRAM IN STATISTICS

The program leading to the M.S. in statistics at UCSD was designed on the premise that students need strong mathematical backgrounds, plus exposure to statistical computing and serious applications. Courses in mathematics and applied statistics, and in probability and stochastic processes are offered. The curriculum includes multivariate analysis, nonparametric statistics, time series, sequential analysis, and numerical analysis. Some courses entail computing on a VAX 11/780. Students in the M.S. program are encouraged to broaden their horizons by studying material in other disciplines.

Mathematics 281A-B, 282A-B, and two of the topics given in 287A-B-C-D are required. For the applied orientation 270A-B-C is suggested, while 280A-B-C is required for a theoretical emphasis. Students are encouraged to take courses in other departments which apply statistical and probabilistic concepts.

A total of forty-eight units of course credit is required. A maximum of twenty-four of these units may come from approved graduate courses outside the Department of Mathematics. At most eight units as a combined total may come from the following: Mathematics 500, and undergraduate upper-division courses in applied mathematics approved by departmental advisers.

Each student must pass, at the master's level, two written comprehensive examinations offered by the Department of Mathematics and approved by departmental advisers as related to the student's studies in statistics. The dates for the comprehensive exams for this program vary. Consult with the instructors of the relevant courses. There is no foreign language requirement, and a thesis is not required. Full-time M.S. students are permitted seven quarters in which to complete all requirements.

DOCTORAL DEGREE PROGRAM

A student acquires a general background in mathematics by preparing for and taking written departmental qualifying examinations in two areas. One of the two areas must be real analysis or complex analysis, another must be algebra or applied algebra or topology. There is a third requirement which depends on the student's area of study; see the faculty adviser. The examinations are typically given at the end of June and in mid-September. A detailed list of depth requirements

in each area, with literature references and approved courses, is available in the office of the Department of Mathematics. No exam may be taken more than twice, and no more than four attempts are allowed to pass the examinations in the two areas.

Students in the Ph.D. program must pass both written qualifying examinations by the September examination session following the second full academic year of study, and the area requirement must be fulfilled by September following the third year. Students in the Ph.D. program who do not pass the examinations according to the above schedule will be transferred to an M.A. program in mathematics.

Students originally admitted to a master's program who wish to transfer to the Ph.D. program later will be evaluated in comparison to the current year applicant pool. Previous passage of qualifying exams at the Ph.D. level is not sufficient for admission to the Ph.D. program.

A student must demonstrate a satisfactory reading knowledge of two foreign languages (chosen from French, German, and Russian; in exceptional circumstances other languages may be substituted.) After a student has met the area and language requirements and has decided upon a field of research under the supervision of a faculty member, a doctoral committee appointed by the Office of Graduate Studies and Research conducts the student's oral qualifying examination. This examination deals primarily with the proposed area of thesis research and may include the project itself. A student must pass this examination by the end of his or her eleventh quarter. Successful completion of this requirement advances the student to candidacy. The student then concentrates on courses and research related to completion of a doctoral dissertation. After completion of the research and dissertation, the student takes a final oral examination on the dissertation.

TIME LIMIT POLICIES

Students must be advanced to candidacy by the end of eleven quarters in order to continue receiving financial support, and twelve quarters in order to remain in the Ph.D. program. Total university support cannot exceed six years. Total registered time as a UCSD graduate student cannot exceed seven years.

Courses

All prerequisites listed below may be replaced by an equivalent or higher-level course. The listings of quarters in which courses will be offered

are only tentative. Please consult the Department of Mathematics to determine the actual course offerings each year.

LOWER DIVISION

1A. Elements of Mathematical Analysis (4)
Differentiation and integration of algebraic functions. Fundamental theorem of calculus. Applications. Three lectures, two recitations. (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, two recitations. *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, two recitations. *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, two recitations. *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, two recitation sections. *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. Maclaurin series for exponential and trigonometric 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, to help them adjust to the UCSD sequence. Three lectures, one recitation. *Prerequisite: Math. 2A or 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 particular interest in mathematics. Three lectures, two recitation sections. *Prerequisites: Math. 2A or 2AH.* (F,W)

2BP. Calculus for AP Students (4)
A problem-based course, covering the topics in Math. 2B with a review of some Math. 2A material. Intended for 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. Three lectures, one recitation. *Prerequisite: Math. 2A, Math. 2AH, or advanced placement.* (F)

2C. Calculus and Analytic Geometry (4)
Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double integration. All students who have received credit for Math. 2A or Math. 2B by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD should take Math. 2CP (Calculus for AP Students), instead of Math. 2C, to help them adjust to the UCSD sequence. Three lectures, one recitation. *Prerequisite: Math. 2B or 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, two recitation sections. *Prerequisites: Math. 2B or 2BH.* (F,W,S)

2CP. Calculus for AP Students (4)
A problem-based course, covering the topics in Math. 2C with a review of some Math. 2A and Math. 2B material. Intended for all students who have received credit for Math. 2A or Math. 2B by advanced placement or other examinations or by taking equivalent courses at institutions other than UCSD. Three lectures, one recitation. *Prerequisite: Math. 2B, Math. 2BH, or advanced placement.* (F,W)

2DA. Introduction to Differential Equations (4)
Infinite sequences and series. Ordinary linear differential equations: initial, boundary-value and eigenvalue problems for single equations and for two equations with two unknowns. Laplace transform methods. Applications are directed towards the physical and engineering sciences. Credit not offered for both Math. 2D and Math. 2DA, three lectures, two recitations. *Prerequisite: Math. 2C or 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, two recitation sections. *Prerequisites: Math. 2EA (2EH), or 2C (2CH) and consent of instructor.* (F,W,S)

2DS. Applications of Differential Equations (4)
A supplementary course to 2D and 2DA in which differential equations are applied to problems in the sciences, engineering, and industry. This course is intended to increase the student's grasp of differential equations and awareness of their uses. One lecture, one recitation. *Prerequisites: Math. 2DA or 2DH or concurrent enrollment, a knowledge of programming.* (Not offered in 1989-90.)

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. Credit not offered for both Math. 2E and Math. 2EA. Three lectures, two recitations. *Prerequisite: Math. 2C or 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, two recitation sections. *Prerequisites: Math. 2C or 2CH.* (F,W,S)

2ES. Applications of Linear Algebra (2)
A supplementary course to 2E and 2EA in which linear algebra is applied to problems in the sciences, engineering, and industry. This course is intended to increase the student's grasp of linear algebra and awareness of its uses. One lecture, one recitation. *Prerequisites: Math. 2EA or 2EH or concurrent enrollment, a knowledge of programming.* (W) (Not offered in 1989-90.)

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. *Prerequisite: Math. 2DA (or 2DH) and Math. 2EA (or 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, two recitation sections. *Prerequisites: Math. 2DH or Math 2DA 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)

6A-B. Introductory Statistics and Mathematical Analysis (4-4)
Descriptive statistics, measures of location and variability, organization of multivariate data, basic probability, random sampling, Central Limit Theorem. Sampling distributions, confidence intervals, hypothesis testing, single population problems, comparisons between two populations. Credit not offered for both Math. 6A and Social Science 60 or Psychology 60. Three lectures and one recitation section. *Prerequisite: intermediate or college algebra.*

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. Re-

quired of all pure mathematics and mathematics/computer science majors and recommended for applied mathematics and scientific programming majors. Three lectures and one recitation section. *Prerequisites: Math. 2EA or 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 or 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-Pinrose 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 or 2EH.* (S)

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. *Prerequisite: Math. 2EA or 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.*

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-2E or consent of instructor.* (Not offered in 1988-89.)

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 (or 2DH) and 2EA (or 2EH) or consent of instructor.* (F,W,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 (or 2DH) and 2EA (or 2EH).* (Not offered in 1988-89.)

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 or 2DH and programming ability (any course).* (Not offered in 1988-89.)

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 1988-89.)

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. *Prerequisites or coregistration: Math. 2F or 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 (or 2DH) and 2EA (or 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 (or 2DH) and 2EA (or 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 (or 2DH) and 2EA (or 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 or 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 or 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. *Prerequisites: Math. 2F or 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)

Overview of computer graphics. Drawing and transformations of points and lines, clipping and windowing, display files, plane curves, three-dimensional graphics, hidden surfaces. Introduction to graphics packages and interactive graphics. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisites: Math. 2EA or 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)

Special mathematical topics relevant to computer graphics. Topics may include: three-dimensional transformations and projections, surface description and generation, hidden lines and surfaces, among others. Three lectures, one recitation, and approximately eight laboratory hours per week. *Prerequisite: Math. 155A or consent of instructor.* (W)

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)

The course will be taught from the original sources in translation, starting from Babylonian times to 1800 A.D. The unifying themes will be the histories of algebra and analysis. Half of the lecture will be actual mathematics of the times. Three lectures, one recitation. *Prerequisite: Math. 1C, 2B, 2BH 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)

167. Probabilistic Methods in Computer Science (4)

This course introduces the probability tools used in the analysis of algorithms. Probability spaces, random variables and stochastic processes. The laws of large numbers. Characteristic functions and the Central Limit Theorem. Moment generating functions and large deviation. Branching processes and random graphs. Coding, entropy, and information. Three lectures, one recitation. *Prerequisite: Math. 184A or consent of instructor.* (W)

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. *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 or 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 or 2EH and knowledge of programming.* (W)

170C. Numerical Ordinary Differential Equations (4)

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 (or 2DH) and 2EA (or 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. (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.* (S)

173. Mathematical Software—Scientific Programming (4)

Development of high quality mathematical software for the computer solution of mathematical problems. Three lectures, one recitation. *Prerequisites: Math. 170A or Math. 174 and knowledge of FORTRAN.* (W)

174. Numerical Methods in Science and Engineering (4)

Floating point arithmetic, linear equations, interpolation, integration, ordinary differential equations, nonlinear equations, optimization, least squares. Three lectures and one recitation. Students may not receive credit for both Math. 174 and

Physics 105 or AMES 153 or 154. Students may not receive credit for Math. 174 if Math. 170 A,B, or C has been taken already. *Prerequisites: Math. 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 or 2FH, Math. 100A or 103A (may be taken concurrently), Math. 79B or CSE 70.*

177. PASCAL Programming (4)

Renumbered. See Math. 77.

178. Elements of Systems Programming (4)

Aspects of systems programming important to mathematicians/computer scientists: machine architecture and assembly language, introduction to the implementation of languages (data representation, control structures, storage management, recursion, subprograms and parameter transmission, local environments). Three lectures. *Prerequisites: Math. 2C or 2CH and programming experience.*

179A-B. Introduction to Artificial Intelligence (4-4)

A general introduction to the basic ideas, techniques, and problems of artificial intelligence including knowledge of representation, search methods, pattern matching, goal reduction, production systems, and control strategies. The logical foundation for automated reasoning and program verification will be provided. The programming languages Lisp and Prolog will also be introduced and used for course work. Three lectures. *Prerequisite: Math. 176A or CSE 161A.* (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 or 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 or 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 or 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 prob-

lems. Three lectures, one recitation. *Prerequisites: Math. 2EA or 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 or 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 Algebraic and Geometric Topology (4)

Euler characteristic, classification of 2-manifolds. Fundamental group, Van Kampen's theorem, covering spaces. Differential topology. Borsuk-Ulam theory and the Kuroch subgroup theorem. Three lectures. *Prerequisite: Math. 141 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: 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)

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, adèles, 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 Physical 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. Eigenfunction 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.)

MATHEMATICS

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.*

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. Iterative methods for linear equations; solution of nonlinear equations; optimization. *Prerequisites: Math. 2EA or 2EH, and knowledge of Fortran.*

271A-B-C. Complexity of Computational Algorithms (4-4-4)

Recent research on the analysis of the complexity of computational algorithms will be explored: high-precision multiplication, manipulation of graphs, matrix multiplication, inversion, linear equations, sparse matrices, polynomial evaluation, discrete Fourier transforms, algebraic manipulation, lower bounds of computations, polynomial complete problems. *Prerequisite: Math. 102 or Math. 100. Some familiarity with computer science or numerical analysis desirable but not required.* (F,W,S)

272A-B-C. Numerical Ordinary and Partial Differential Equations (4-4-4)

The numerical solution of ordinary differential equations and of elliptic, parabolic, and hyperbolic partial differential equations. *Prerequisites: Math. 170A, 172, or consent of instructor.* (F,W,S)

277A-B-C. Topics in Numerical Mathematics (4-4-4)

Topics vary from year to year. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.*

278. Seminar in Numerical Mathematics (1 to 4)

Prerequisite: consent of instructor. (S/U grades permitted.)

280A-B-C. Probability Theory (4-4-4)

Probability measures; Borel fields; conditional probabilities, sums of independent random variables; limit theorems; zero-one laws; stochastic processes. *Prerequisites: advanced calculus and consent of instructor.* (F,W,S)

281A-B-C. Mathematical Statistics (4-4-4)

Testing and estimation, sufficiency; regression analysis; sequential analysis; statistical decision theory; nonparametric inference. *Prerequisites: advanced calculus and consent of instructor.*

282A-B. Applied Statistics (4-4)

Sequence in applied statistics. First quarter; general theory of linear models with applications to regression analysis. Second quarter; analysis of variance and covariance and experimental

design. Third quarter: further topics to be selected by instructor. Emphasis throughout is on the analysis of actual data. *Prerequisite: Math. 181B or equivalent or consent of instructor.* (S/U grades permitted.)

285. Statistical Inference in the Medical and Biological Sciences (4)

A first course in statistical procedures for the medical and biological sciences. Topics will be chosen from among experimental design, counts, regression and correlation, analysis of variance, survivorship, classification. Some emphasis will be given to computational techniques. *Prerequisite: consent of instructor.* (This course offered only to graduate students in the medical or biological sciences and to medical students.) (W)

287A. Time Series Analysis (4)

Discussion of finite parameter schemes in the Gaussian and non-Gaussian context. Estimation for finite parameter schemes. Stationary processes and their spectral representation. Spectral estimation. *Prerequisite: Math. 181B or equivalent or consent of instructor.*

287B. Multivariate Analysis (4)

Bivariate and more general multivariate normal distribution. Study of tests based on Hotelling's 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 (read-

ing) 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.)*

501. Computer Assistance in Mathematics Teaching (4)

Instruction in the use of scientific programming languages and UCSD computing facilities as an aid in the teaching of mathematics. One lecture. *Prerequisite: graduate-student status in mathematics. (S)*

Assistant Professors

Daniel James Donoghue, Ph.D., *Chemistry*
 Theo N. Kirkland, M.D., *Pathology and Medicine*
 Michael J. Kelner, M.D., *Pathology*
 Eva Y.-H. P. Lee, Ph.D., *Pathology*
 Clayton A. Wiley, M.D., Ph.D., *Pathology*

Adjunct Professors

Lynette B. Corbeil, D.V.M., Ph.D., *Pathology*
 Frances D. Gillin, Ph.D., *Pathology*
 Erkki Ruoslahti, M.D., *Pathology*

Adjunct Assistant Professors

Robert Bookstein, M.D., *Pathology*
 Peter Scully, M.D., *Pathology*

Research Series

George G. Glenner, M.D., *Research Pathologist*

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 both basic pathology and in molecular biology. 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. Each of these courses will be taught in alternate years starting in fall of 1989.

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 proj-

ect. 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 a 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 at the end of the third year.

TEACHING

All students are required 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

208-G. 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.

222. Readings in Molecular Pathogenesis (2)

Readings presented by graduate students which will explore topics currently investigated in specialized areas of molecular mechanism of human diseases and provide opportunities for students to gain experience in the organization. Critical evaluation and oral presentation of information from literature.

223. Concepts in Viral Pathogenesis (4)

The course is designed to develop a basic understanding of viral pathogenesis and how this relates to human disease. Contributions of virus and the immune system in the progression of disease and recovery will be discussed.

224. Frontiers in Neurovirology (2)

This course will examine in depth the spectrum of nervous system disease caused by viruses. Beginning with an overview of

MOLECULAR PATHOLOGY

OFFICE: 1012 Basic Science Building, School of Medicine

Associated Faculty:

Professors

Nicholas M. Alexander, Ph.D., *Pathology*
 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*
 James Feramisco, Ph.D., *Medicine*
 Joshua Fierer, M.D., *Medicine and Pathology*
 John J. Holland, Ph.D., *Biology*
 Aaron S.W. Hsueh, Ph.D., *Reproductive Medicine*
 Thomas A. Lane, M.D., *Pathology*
 S.P. Masouredis, M.D., Ph.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*
 Douglas Richman, M.D., *Pathology and Medicine*
 Robert D. Terry, M.D., *Neuroscience and Pathology*
 Gernot Walter, Ph.D., *Pathology*

Associate Professors

Robert S. Fujinami, Ph.D., *Pathology*
 Martin Haas, Ph.D., *Biology*
 Michael Karin, Ph.D., *Pharmacology*
 Wen-Hwa Lee, Ph.D., *Pathology*
 Ann Rearden, M.D., *Pathology*
 David Schubert, Ph.D., *Salk Institute*
 Bartholomew M. Sefton, Ph.D., *Salk Institute*
 Deborah H. Spector, Ph.D., *Biology*
 Raymond Taetle, M.D., *Pathology and Medicine*

MUSIC

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the history of neurovirology, general concepts in the pathogenesis of central nervous system infections will be discussed.

225. Molecular Pathology Seminar (1)

Group and individual discussion of current literature and ongoing research activities. The format of SOM 225 will encourage student participation. Students are to present on their rotation work or current research project.

296. Directed Reading (1-4)

Reading and laboratory study of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases.

299. Independent Study or Research (1-12)

Independent study or research.

MUIR COLLEGE

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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 strat-

egies 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 Muir 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 Muir 50 sections are available each quarter in the Muir Writing Program office during preregistration.)

Students entering fall quarter 1985 and after will be required to take both Muir 40 and Muir 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 Muir 40 and Muir 50 in their first year of residence. In cases where more than one quarter of practice is needed to prepare a student for Muir 50, an IP grade is given in Muir 40, and the student takes Muir 41. Completion of the sequence allows students to meet the Muir College writing requirement.

Certain exceptionally well-prepared students, particularly transfer students, may satisfy Muir 40 or Muir 50 by examination. The Muir challenge examinations are given in the second week of each quarter.

40-50. Critical Writing (4-4)

A sequence in university reading and writing required of all Muir College freshmen and of transfer students who have not completed comparable courses elsewhere. Satisfies the Muir College graduation requirement in writing. Muir 40 introduces students to the basic elements of argument and analysis. Muir 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 Muir 50 will be given a grade of IP and will be required to take Muir 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 Muir 40 or its equivalent but need additional writing practice to prepare for Muir 50. Muir 41 does not satisfy the first part of the Muir Writing requirement. Muir 41 must be taken for a letter grade and must be taken within two quarters of Muir 40. *Prerequisite: Muir 40 or its equivalent.*

MUSIC

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OFFICE: 110 Mandeville Center for the Arts

Professors

Robert Erickson, M.A., *Professor Emeritus*
Peter Farrell, M.M., *Chairman*
Brian Ferneyhough, Dip. Mus.
Jean Charles Francois, 1^{er} Prix
Edwin Harkins, Ph.D., *Vice Chairman*
Cecil Lytle, B.A.
F. Richard Moore, Ph.D.
Thomas Nee, M.A.
János Négyesy, Dip. Mus.
Wilbur Ogdon, Ph.D.
Carol Plantamura, M.F.A.
Roger Reynolds, M.M.
John Silber, Ph.D.
Bertram Turetzky, M.A.
Joji Yuasa

Associate Professors

Gerald Balzano, Ph.D.
John Fonville, D.M.A.
Jann Pasler, Ph.D.

Assistant Professors

Marnie Dilling, Ph.D.
Rand Steiger, M.F.A.
Jane Stevens, Ph.D.

Lecturer

James Cheatham, Dip. Mus.

Artists in Residence

Celin Romero, Dip. Mus., B.A.
Pepe Romero, B.A.

Affiliated Faculty

Kenneth Anderson
Garrett Bowles, Ph.D.
David Chase, D.M.A.
Keith Humble, 6^e Perf.
Philip Larson, M.M.

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 the UCSD Center for Music Experiment's Computer Audio Research Laboratory (CARL), 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 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 interested in music as one of the fine arts, who 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 interested in music as one of the liberal arts, who 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.

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/Not 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

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.) The Department of Music offers many of its courses as elements which are possible to combine for a minor program. All combinations meeting the above conditions will be considered. However, 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.

ADVISING OFFICES

Fifth and Music Humanities Muir	Professor Pasler, 118 Mandeville Center, 534-6754
Revelle	Professor Turetzky, B-144 Mandeville Center, 534-2408
Third	Professor Fonville, B-130 Mandeville Center, 534-4712
Warren	Professor Cheatham, B-140 Mandeville Center, 534-2182
	Professor Steiger, B-131 Mandeville Center, 534-3675

M.A.	Professor Nee, B-126 Mandeville Center, 534-2679
Ph.D.	Professor Silber, B-122 Mandeville Center, 534-4781

Staff Contacts:

- Graduate:
Eleanor Little, 109 Mandeville Center, 534-3279
- Undergraduate:
Stephanie Hurtik, 110/115 Mandeville Center, 534-0288 or 534-4433

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 one area of performance skills.
2. Where applicable, a repertory list of works performed during the past year and a sample of printed concert programs in which they have participated.
3. A minimum of two papers illustrating ability in any one of the following: analysis, criticism, aesthetics, or music technology.
4. Where applicable, a minimum of two scores of instrumental works with tapes of these (and also of electronic compositions, if desired).
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 submit TOEFL scores.)
6. Official transcripts.

After an **advisory examination** administered during the week prior to the start of classes in the fall quarter, each new student will meet with the departmental master's 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 retested at the end of that first year. **Students will not be advanced to can-**

didacy 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 studies*. The degree requires 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 201A-B-C laboratory 1, Twentieth-Century Ensemble, every quarter; non-performers must take 201B, winter quarter, twice, as well as 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 are encouraged to use these as opportunities to present their own work, their research, and 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 required 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 quar-

ters, 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.

Students who wish to emphasize *theoretical 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 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 appropriate way of fulfilling this requirement. All graduate students must enroll in the department seminar, Music 143, every 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 201B	203C 228
210	291	
*Other	*Other	*Other
<i>Second Year</i>		
203D	299	299
206/207	207/206 201B	
*Other	*Other	*Other
PERFORMANCE EMPHASIS		
<i>First Year</i>		
232	232 291	232
201A	201B	201C
210		
*Other	*Other	*Other
<i>Second Year</i>		
232D	299	299
Lit./Perf.	Lit./Perf.	
201A	201B	201C
*Other	*Other	*Other
THEORETICAL STUDIES EMPHASIS		
<i>First Year</i>		
203A/232A	203B/232B	203C/232C
206	201B	
210	291	228
*Other	*Other	*Other
<i>Second Year</i>		
	299	299
207	207 201B	
*Other	*Other	*Other
COMPUTER MUSIC EMPHASIS		
<i>First Year</i>		
263	263	263
210	201B	228
203A/232A+	203B/232B+	203C/232C+
	291	
*Other	*Other	*Other
<i>Second Year</i>		
263	299	299
	201B	
206 or	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 studies* will write an extended research paper on a topic chosen with their adviser.
4. Candidates emphasizing *computer music* will write a research paper 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 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 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 studies* is not necessarily incompatible with significant stress on performance or computers. The specific departmental requirements for the degree are:

1. 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 which follows, if the student has not participated in UCSD's master's degree program.)
2. A minimum of eight doctoral-level seminars beyond the M.A. which are approved in consultation with the student's committee. Ph.D. students are expected to take two or three 209-level seminars during each of their first two years, and these four courses, in addition to four of two each chosen from the 206/207 offerings, will be counted towards the required eight. (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 chairperson. The student and his or her committee chairperson 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 chairperson 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. 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.

5. An acceptable dissertation (*theoretical studies*) or a major composition project (*composition*).

6. A final public defense of the dissertation/composition (twelfth quarter).

7. Six units of credit in Music 500 (unless the student has completed this requirement in UCSD's master's degree program).

8. Music 143 every 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 master's degree), six years (without master's degree). Students unable to advance to doctoral candidacy before the end of the third year in the Ph.D. program must petition the Department of Music Graduate Committee in writing for approval of additional time, in no case to exceed a fourth year.

Maximum Time Limits in the Ph.D. Program: maximum four years precandidacy, maximum five 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)	203B(Ph.D.) (291) 201B	203C(Ph.D.) (228)
(209—four or more required for the Ph.D. degree)		
*Other	*Other	*Other
<i>Second Year</i>		
203D (206/207—four or more required for the Ph.D. degree)	299 201B	299
209		
*Other	*Other	*Other
THEORETICAL STUDIES		
<i>First Year</i>		
+232/203/263 (201A) (210)	+232/203/263 201B (291)	+232/203/263 (201C) (228)
(209—four or more required for the Ph.D. degree)		
*Other	*Other	*Other

Second Year		
206 (232)	299	299
††(206/207—four or more required for the Ph.D. degree)		
	201B	
*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 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)

Eight 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 quarter

Third and Fourth Years

Written and oral qualifying examination

Dissertation writing

Dissertation defense

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. 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: 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 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.*

13. World Music (4)

Fundamental issues in the creation and experience of music, studied through comparing Western and non-Western musical traditions. Topics, varying from year to year, may include art vs. craft, oral vs. written traditions, improvisation, the influence of language on music, the function of music in society. *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 curricu-

lum. 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 in 1990-91.)

Section I. Music Theater (Not offered in 1990-91.)

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)

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.*

111. World Music (4)

A course of illustrated lectures giving an introduction to and brief summary of selected musics of the world. *Prerequisites: none.*

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. Mu-



**cf., above under 1.

MUSIC

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music majors are assigned additional projects. *Prerequisites:* none. *Music 4 or 120 recommended, or consent of instructor.* (Not offered in 1990-91.)

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 1990-91.)

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.* (Not offered in 1990-91.)

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.* (Not offered in 1990-91.)

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. *Some 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.

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. *Prereq-*

uisites: *Music 4, 7, or 120 recommended, or consent of instructor.* (Not offered in 1990-91.)

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.

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. *Prerequisite:* 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. 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.

160A. Basic Electroacoustics (4)

An introduction to the acoustics of music and to modern techniques of recording sound. *Prerequisites:* *Music 1A-B-C or 2A-B-C and consent of instructor.* Department stamp required.

160B. Musical Psychoacoustics (4)

Survey of psychoacoustical phenomena, theories of hearing, and their relation to musical perception and cognition. Techniques of psychoacoustical experimentation. *Prerequisite:* consent of instructor. *Music 160A recommended.* Department stamp required.

160C. Electronics in Music (4)

Seminars in theoretical and applied research in the generation and processing of electronic sound for composition and performance. *Prerequisites:* *Music 160A and consent of instructor.* Department stamp required.

161. Programming for Musical Applications (4)

A first hands-on course in computer programming designed around the application of computers to the processing of musical sound and structures. *Prerequisites:* *Music 160A-B-C and consent of instructor.* Department stamp required.

162. Introduction to Computer Music (4)

Hands-on introduction to building instruments and creating music with computers. *Prerequisites:* *Music 161 and consent of instructor.* Department stamp required.

163. Music Technology Seminar (4)

Selected topics in music technology and its application to composition and/or performance. Offerings vary according to faculty availability and interest. May be repeated for credit. *Prerequisites:* *Music 162 and consent of instructor.* Department stamp required.

195. Instructional Assistance (2)

Assisting in the instruction of an undergraduate music class under the direct and constant supervision of a faculty member. May be taken for credit three times. *Prerequisites:* consent of instructor and departmental approval.

198. Directed Group Study (1-4)

Concentrated inquiry into various problems not covered in the usual undergraduate courses. *Prerequisite:* consent of instructor.

199. Independent Study (2 or 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 departmental approval. May be taken for credit three times.

GRADUATE

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 during two winter quarters.

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 (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 often includes individual projects

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.

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.

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.

211. Seminar in World Music (4)

A comparative study of the world's music. Analysis of recorded examples or live performances of examples from different musical cultures. A study of the place of music in specific societies. A study of writings in ethnomusicology.

212. Seminar in Vocal and Choral Literature (4)

A critical and historical study of selected works and repertory. (Not offered in 1990-91.)

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 in 1990-91.)

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. (Not offered in 1990-91.)

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. (Not offered in 1990-91.)

220. Seminar in Bach and Related Studies (4)

A study of content and structure in selected compositions of J. A. Bach. *Prerequisite: consent of instructor.* (Not offered in 1990-91.)

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.

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 in 1990-91.)

224. Seminar Studies in Chamber Literature (4)

A critical and historical study of selected works and repertory. (Not offered in 1990-91.)

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.*

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 in 1990-91.)

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 in 1990-91.)

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 (4)

The course will give practical experience in historical research including use of important source materials, evaluation of editions, and examination of performance practice problems. (Normally offered winter quarter.)

298. Directed Research (1-4)

Individual research. (S/U grades permitted.) May be repeated for credit.

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

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*

John W. Evans, Ph.D., *Mathematics*

Edmund J. Fantino, Ph.D., *Psychology*

Fred H. Gage, Ph.D., *Group Chairman and*

Director/Neurosciences

Robert Galambos, M.D., Ph.D., *Emeritus/*

Neurosciences

Mark A. Geyer, M.D., *Psychiatry*

J. Christian Gillin, M.D., *Psychiatry*

Philip M. Groves, Ph.D., *Psychiatry*

Walter F. Heiligenberg, Ph.D., *Behavioral*

Physiology

Stephen F. Heinemann, Ph.D., *Adjunct/*

Neurosciences

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*

Arnold J. Mandell, M.D., *Psychiatry*

Arnold L. Miller, Ph.D., *Adviser/In Residence,*

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*
 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*
 Palmer W. Taylor, Ph.D., *Pharmacology*
 Robert D. Terry, M.D., *Neurosciences and Pathology*
 Leon Thal, M.D., *Neurosciences*
 Doris A. Trauner, M.D., *Neurosciences and Pediatrics*
 Robert D. Tschirgi, M.D., Ph.D., *Emeritus/Neurosciences*
 Wylie Vale, Ph.D., *Adjunct/Medicine*
 Silvio S. Varon, M.D., Eng.D., *Biology*
 W.C. Wiederholt, M.D., *Neurosciences*
 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*
 Joan Heller-Brown, Ph.D., *Pharmacology*
 Stephen L. Foote, Ph.D., *In Residence/Psychiatry*
 Richard Haas, M.D., *Neurosciences and Pediatrics*
 Vicente J. Iragui-Madoz, M.D., Ph.D., *Clinical Neurosciences*
 George F. Koob, Ph.D., *Adjunct/Psychology*
 Marta Kutas, Ph.D., *Cognitive Science*
 E. Roger Marchand, Ph.D., *Adjunct/Neurosciences*
 Robert R. Myers, Ph.D., *Anesthesiology*
 Helen J. Neville, Ph.D., *Adjunct/Neurosciences*
 Daniel T. O'Connor, M.D., *In-Residence/Medicine*
 Tsunao Saitoh, Ph.D., *Neurosciences*
 Ajit Varki, M.D., *Medicine*
 Stuart Zola-Morgan, Ph.D., *In-Residence/Psychiatry*

Assistant Professors

Thomas Albright, Ph.D., *Adjunct/Neurosciences*
 Gordon Baylis, Ph.D., *Psychology*
 Richard L. Hauger, M.D., *Psychiatry*
 Greg Lemke, Ph.D., *Adjunct/Neurosciences*
 Pamela Mellon, Ph.D., *Adjunct/Neurosciences*
 Robert Milner, Ph.D., *Adjunct/Neurosciences*
 Mark Montminy, Ph.D., *Adjunct/Neurosciences*
 Dennis D. Rasmussen, Ph.D., *Reproductive Medicine*
 Clifford Shults, M.D., *Neurosciences*
 Patricia Walicke, M.D., Ph.D., *Neurosciences*
 Matthew Weinger, M.D., *Anesthesiology*
 Charles G. Zucker, Ph.D., *Biology*

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 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 presently 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 for research on marine forms, vertebrate and invertebrate, are available.

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 chairman.* (F,W,S)

GRADUATE

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)

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. Emphasis on examples from neuroscience. *Prerequisite: consent of instructor.* (S/U grades only.) (F)

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.) (S)

263. Advanced Cellular 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.) (F)

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.) (S)

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)

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. (W)

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.) (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)

PHILOSOPHY

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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

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OFFICE: 3108 Galbraith Hall, Revelle College

Professors

Henry E. Allison, Ph.D.
Richard J. Arneson, Ph.D.
Paul M. Churchland, Ph.D.
Patricia Smith Churchland, B.Phil.
Gerald D. Doppelt, Ph.D.
Philip S. Kitcher, Ph.D.
Edward N. Lee, Ph.D.
Stanley W. Moore, Ph.D., *Professor Emeritus*
Frederick A. Olafson, Ph.D.
Robert B. Pippin, Ph.D., *Chairman*
Avrum Stroll, Ph.D.
Zeno Vendler, Ph.D., *Professor Emeritus*

Associate Professors

George H. Anagnostopoulos, Ph.D.
S. Nicholas Jolley, Ph.D.
Patricia W. Kitcher, Ph.D.
Adrian M.S. Piper, Ph.D.

Assistant Professors

Sandra D. Mitchell, Ph.D.
Gila Sher, 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 prerequi-

site. 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.

THE GRADUATE PROGRAM

The Department of Philosophy offers programs leading to the M.A. and Ph.D. There is no sequence of required courses in either program. Courses of study are arranged according to the need, interest, and experience of the individual student.

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 the study, from a variety of perspectives, of traditional and contemporary philosophical issues.

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 in section III of the "Doctoral Degree Program." 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.

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

Unless the student's undergraduate work has already covered the material adequately, the student must pass 110 with at least a B+ by the end of the third term. And the student must pass 111 or 112 with at least a B by the end of the sixth term.

DISTRIBUTION REQUIREMENTS

By the end of the seventh quarter of residence, a student must have completed the following ten graduate courses:

1. **Four courses** 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 courses** chosen from the fields of ethics, social philosophy, political philosophy.

3. **Four courses** 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

1. 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.

2. In the third year of residence, the student must pursue a course of study under the guidance of a two-member advisory committee, aimed at making the student familiar with the literature in the area that his or her dissertation prospectus will address. The student must approach the relevant faculty, choose the committee, and notify the graduate adviser of its membership before the beginning of the third year of residence.

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 commit-

tee. 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: Graduate Adviser, Philosophy Department, B-002, UCSD, La Jolla, CA 92093-0302.
E-mail address: casmann@ucsd.edu.

SCIENCE STUDIES PROGRAM

Students in philosophy/science studies, like other philosophy students, 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, no more than four of which are from any single area; two courses must be taken in history of science, and two 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).

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 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 Political Science 27.) An inquiry into the principles of ethical conduct and their application. 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 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.

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: depart-*

ment 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 of other writings of Kant. *Prerequisite: department stamp 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. 10 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 theoretical 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 it 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)

(Same as Humanities 145.) 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)

(Same as Humanities 150.) 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)

(Same as Humanities 152.) 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)

(Same as Humanities 164.) 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 univer-

sals 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.

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)

(Same as STPA 107.) 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 chairman.*

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 as, 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 either as teaching assistants 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., *Conditioning Coordinator*

Diana E. Chadwell, M.S., *Rehabilitation and Physically Disabled Coordinator and Fitness Assessment/Aquatic Coordinator*

Barry Cunningham, Ed.D.

John H. Douglass, Ph.D.

Howard F. Hunt, Ph.D., *Emeritus*

Margaret C. Marshall, M.F.A., *Co-Coordinator of Dance Program*

J. Charles Millenbah, M.A., *Chairman*

Bert N. Kobayashi, Ph.D.

Robert C. Moss, M.S.

Andrew Skief, Jr., M.S., *Instructional Facilities Coordinator*

Judith M. Sweet, M.S., M.B.A.

Frank N. Vitale, M.S.

James R. White, Ph.D., *Team and Individual Sports Coordinator*

Associate Supervisors

Ann K. Jones, Ph.D.

Patricia A. Rincon, M.F.A., *Co-Coordinator of Dance Program*

Teachers/Special Programs

Check the current list of instructors located in the Main Office, Department of Physical Education. For information call (619) 534-0334.

INSTRUCTIONAL PROGRAM

The instructional program in the Department of Physical Education at UCSD consists of two major divisions:

1. A general instructional program in a variety of fitness, sport, and dance activities, and
2. An academic minor program in physical fitness and health management.

MINOR PROGRAM

PHYSICAL FITNESS AND HEALTH MANAGEMENT

The Department of Physical Education offers a noncontiguous minor in physical fitness and health management designed to provide students with an understanding of the interrelated areas of physical fitness and health management. The lower-division courses are intended to give the students preparation in biology, chemistry, and social sciences, upon which the upper-division courses are built. Some of the lower-division requirements will normally be a duplication of the student's major requirements and, therefore, may not have to be repeated.

The minor is structured to study the human body from different perspectives. For example, in P.E. 84, Anatomy/Kinesiology, the structure of bones, muscles, and nerves are studied in relation to a variety of human movement situations. In P.E. 160, Exercise Physiology, the human body is studied from a physiological perspective, which focuses on human potentials and limitations during exercise. In P.E. 170, Psychological Basis of Sport and Physical Activity, psychological explanations of human behavior, pre-, post-, and during exercise are studied. Anatomical, physiological, and psychological explanations are only partially useful, however, because they focus exclusively on the individual. The sociological perspective used in P.E. 120, Sports in America, and 121, The Black Athlete, in contrast, stresses those factors external to the individual. These five courses provide the students with an integrated understanding of the human experience in regard to exercise and physical education. For information call (619) 534-4033.

LOWER DIVISION

- Physical Education 81 — Introduction to P.E.
- Physical Education 84 — Anatomy/Kinesiology

Lab

Biology 13 — Nutrition (Prerequisite—Biol. 10)

UPPER DIVISION

- Physical Education 120 — Sports in America (Prerequisite—Soc. 1 or equivalent)
- Physical Education 121 — The Black Athlete (Prerequisite—Soc. 1 or equivalent)
- Physical Education 160 — Exercise Physiology (Prerequisite—Biol. 14, Chem. 5A, Chem. 5B)
- Physical Education 160L — Exercise Physiology Lab (Prerequisite—Biol. 14, Chem. 5A, Chem. 5B)
- Physical Education 170 — Psychological Basis of Physical Activity (Prerequisite—Psych. 1, 2, 3, or 4)

PHYSICAL EDUCATION MINOR FOR REVELLE NONCONTIGUOUS MINOR

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To satisfy requirements for a noncontiguous P.E. minor, a Revelle student must meet all requirements specified by the P.E. department (see above). In addition to this, at least two of the lower-division courses must be noncontiguous to the major and these two courses may *not* be used on any other general-education requirement.

GENERAL INSTRUCTIONAL PROGRAMS

The Department of Physical Education's General Instructional Program provides enthusiastic, contemporary, and comprehensive instruction in a wide variety of fitness, sport, and dance 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, exercise, nutrition, and weight control, stretching/flexibility, triple fitness conditioning, interval running, long distance running, and cycling. Optional fitness testing is available for all fitness/conditioning students. Results are analyzed, and students receive counseling.

DANCE PROGRAM

The program in dance provides a well-rounded curriculum covering dance technique, basic theory and composition, and performance opportunities. Multi-levels of technical training are offered in ballet, modern, and jazz. Other course offerings include musical theatre, dances of a selected culture, ballroom, and folk dance.

Choreography courses are offered on a regular basis incorporating experimental and fundamental composition. Class discussions in related dance history and terminology are included in the curriculum each quarter.

Performing is encouraged as an educational necessity at the intermediate and advanced levels, and is culminated in campus and community productions. The campus also draws a wide variety of professional dance companies for performances.

In addition to offering interested students an introduction to dance, the program also provides a means for improving such areas of physical fitness as cardiovascular and muscular endurance, flexibility, balance, and coordination.

AREAS OF INSTRUCTION

Certificate Courses

Lifesaving, Water Safety Instruction, First Aid, and First Aid Instruction

Individual and Team Sports

Individual Sports

Tennis, Badminton, Golf, Squash, Handball, Gymnastics, Karate, and Fencing

Team Sports

Volleyball, Basketball, Softball, Soccer

Aquatics Program

Swimming, Skin Diving, Scuba Diving, 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 534-0334.

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:

- A. Introductory level (intended for those with little or no previous experience in the activity).
- B. Advanced beginning level (continued instruction and practice on basic skills).
- C.&D. Intermediate level (improvement of skill techniques and/or game strategy.)
- E. Advanced level (for skilled participants with instruction to perfect techniques and sharpen competitive strategy).
- F. Courses specially designed for the physically handicapped student.

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.

3. Lifesaving (.5)

The American Red Cross Senior Lifesaving Certificate will be awarded to students satisfactorily completing the course. Emphasis is placed upon knowledge and skills to prepare one to save his or her own life, or the life of another in an emergency. *Prerequisite: intermediate swimming or 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 lifesaving 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.*

5. Spring Board Diving (.5)

This course will emphasize the three areas of a dive: the approach and take off, the flight of the dive, and entry technique. Safety and dryland techniques will be discussed and practiced. Students will progress to various dives at individual learning rates.

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-E. 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.*

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.

18. Choreography (.5)

Exploration of movement as a tool for communication. Examination of symmetrical, asymmetrical, oppositional, and successional shapes along with analysis of spacial designs and rhythmic patterns. Methods of composition using improvisation and props will be included. (All students enrolled will be required to choreograph a three- to ten-minute dance work. If the student desires, his or her work may be auditioned for inclusion in the Annual Faculty/Student Dance Concert held in the Mandeville Theatre at the end of the spring quarter.) *Prerequisites: Advanced beginning to intermediate advanced-level technique, consent of instructor.*

18L. Choreography Rehearsal Lab (.5)

This course is in conjunction with P.E. 18, a lecture course in choreography. This is a continuation of developing choreographic ideas. Emphasis will be on formulating the creative process into a complete dance form. Final dance projects are required and will be performed at the end of each quarter. Performance opportunities at the end of the winter and spring quarters. *Prerequisite: concurrent enrollment in P.E. 18 or consent of instructor.*

19. Squash (.5)

Introduction to the sport, including instruction in fundamental skills and techniques, individual and group practice, and opportunities for competition.

20A-C. Handball (.5)

Instruction in fundamentals of the serve, rally, and court strategy. Opportunity for singles and doubles competition. A = Beginning; C = Intermediate.

21A. Modern Dance, Beginning (.5)

Opportunities in dance, techniques. Pattern variations will be discovered in time, space, and design. Students will explore improvisation and composition. These, woven together with the technical skills, will produce a means of communication through a controlled body.

21B. Modern Dance, Advanced Beginning (.5)

Modern dance at the level beyond beginning, but not at the intermediate level. Requires some knowledge and ability. A continuation of 21A. *Prerequisite: beginning modern dance or consent of instructor.*

21C. Intermediate Modern Dance (.5)

The content of Intermediate Modern Dance class is based on the language of body movement. All types of movement are explored and re-explored, developing mind and body coordination and kinetic resources. Various modern and contemporary techniques are taught. *Prerequisites: beginning modern dance and consent of instructor.*

21E. Advanced Modern Dance (.5)

Emphasis will be on development of technical and creative skills by exposure to more complex movement and rhythmical patterns through challenging repertory and improvisation. Complexities in motivation, partnering, and individual and group choreography will be explored. *Prerequisites: P.E. 21C and consent of instructor.*

22A. Jazz Dance, Beginning (.5)

Emphasis will be on technical skills of jazz dance including current dance trends, general rhythmic exercises, isolations, turns, locomotor combinations, and dance sequences to the accompaniment of contemporary rock and jazz music. Students will have the opportunity for simple improvisation and composition.

22B. Jazz Dance, Advanced Beginning (.5)

Emphasis will be on technical skills of jazz dance including current dance trends, general rhythmic exercises, isolations, turns, locomotor combinations, and dance sequences to the accompaniment of contemporary rock and jazz music. Students will have the opportunity for simple improvisation and composition. *Prerequisite: beginning jazz or consent of instructor.* (Note: Progressive levels within the techniques taught in jazz classes assist the student to advance from introductory to higher levels.)

22C. Jazz Dance, Intermediate (.5)

A dance technique class in which the student learns the contemporary and lyrical styles of jazz dance to rhythmical music, working in individual and group situations. Students learn techniques and body control, advancing toward performance. *Prerequisites: beginning jazz and/or consent of instructor.*

22E. Jazz Dance, Advanced (.5)

Advanced technique in jazz dance incorporating the styles of "blues" to "rock." Emphasis on flexibility, line and style, musicality, choreography, and composition. *Prerequisite: intermediate jazz or consent of instructor.*

23A. Ballet, Beginning (.5)

An introduction to classical ballet. An experience in a disciplined form of dance which is essential to dancers before attempting modern and contemporary dance styles. An opportunity for students to be trained in ballet with emphasis on technique, theory, music, projection, and terminology.

23B. Ballet Dance, Advanced Beginning (.5)

A continuation of 23A. For the ballet student who has achieved some skills and ability, but not yet at the intermediate level. *Prerequisite: 23A or consent of instructor.* (NOTE: Progressive levels within the techniques taught in ballet classes assist the student to advance from introductory to higher levels.)

23C. Ballet, Intermediate (.5)

A continuation of ballet with emphasis on technique, theory, music, projection, and terminology designed for students with more training. *Prerequisite: beginning and advanced beginning ballet and/or consent of instructor.*

23E. Ballet, Advanced (.5)

A continuation of ballet technique, theory, music, and terminology designed for the student with advanced training. May include pointe work, pas de deux, variations, and choreography. *Prerequisites: intermediate ballet and consent of instructor.*

24. Folk Dance, Beginning (.5)

This course is an introduction to folk dance, designed to help the beginning student learn basic steps, formations, and patterns in folk dance. Familiar round and square dances will be taught. Confidence and creativity in following rhythms and responding with movement will be stressed.

25A-B-C. Tap Dance (Beg., Adv. Beg., and Intermed.) (.5)

Emphasis on rhythm, coordination, timing and style. Introductory (beginning) course will teach basic time step, soft shoe, fast buck rhythms, and simple routines suitable for performance. Advanced-Beginning will include more intricate rhythms such as riffs, pull backs and wings. Intermediate course uses more complicated rhythms and requires more skills. All classes have exercises at the barre.

PHYSICAL EDUCATION

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26A-B-C. Ballroom Dance (.5)

Course will include four to six basic variations of foxtrot, tango, waltz, samba, rhumba, and swing. Includes discussion and instruction by students about current trends in dance, e.g., hustle, bus stop. Extracurricular events will be encouraged.

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.

27D. Aerobic Dance/Energy for the Actor (.5)

Develop understanding and self-initiative in cardiovascular fitness, using jazz dance exercise as primary tool. Resting and exercise target heart-rates, blood pressure and food-as-fuel dieting will be explored, individually. Daily workout during times of heavy stress and deadlines will be discussed, as relations to lifetime benefits.

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.

28S. Dance of a Selected Culture (.5)

Introduction to forms and styles in dance of a selected cultural area (i.e., Afro-Cuban, Indonesian, Japanese, Indian, etc.) on a jazz and modern base.

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. Students 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.

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.

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:* P.E. 1C, 1D, 33A, or 33C or consent of instructor.

44A-B-C. Musical Theatre Dance (.5)

The study of characterization and technique of musical theatre dance, including folk and fad dances from 1900 to the present, partnering, tap dance, jazz dance, use of props and video sessions. *Prerequisite:* one year dance technique 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.

■ P.E. MINOR COURSES

81. **Introduction to Physical Education (2)**

An introduction to historical, biochemical, physiological, psychological, and sociological foundations of physical education.

84. **Anatomy/Kinesiology (4)**

Study of anatomical and mechanical fundamentals of human motion. Qualitative and quantitative application of kinesiological principles to a variety of movement situations.

120. **Sports in America (4)**

This class will study and analyze the institution of sport in American life from a sociological perspective (i.e., social structure and processes) and focus on the reciprocal linkages of sport with other institutions such as politics, economics, education, and religion. *Prerequisites: Sociology 1A-1B.*

121. **The Black Athlete (4)**

This class will study and analyze the role of the black athlete in the institution of sports in American life from a sociological perspective (i.e., social structure and processes) with a brief social history from 1777 to the present.

160. **Exercise Physiology (4)**

The effects of exercise on the cardiovascular, respiratory, neuromuscular, and metabolic systems will be studied from the perspective of human physiology. Introductory laboratory techniques and procedures will be undertaken. Field trips to V.A., Scripps, and UCSD Medical Center. *Prerequisites: lower-division chemistry and biology.*

160L. **Exercise Physiology Lab (2)**

Having gained a theoretical background in P.E. 160, the students will apply the theoretical principles to laboratory experiences. Laboratory instruction in stress testing techniques and protocol, pulmonary function testing, exercise electrocardiography, specific bioassays to determine energy metabolism, and analytical electromyography will be taught. *Prerequisite: P.E. 160.*

170. **Psychological Basis of Sport and Physical Activity (4)**

This course is a survey of human performance theory, learning and sport psychology as applied to the sport and physical activity domain. Specific topics include input, decision and effector mechanisms; memory and schema theory in learning motor skills; personality and sport participation and performance. *Prerequisite: introductory psychology.*

195. **Teaching Assistant in Academic P.E. Minor (1-4)**

Introduction to the teaching of a lower-division academic course in the P.E. minor curriculum. Under the direction of the instructor, the student will assist as "teaching assistant." Weekly meetings with instructor, written reports on methods and materials required. *Prerequisite: consent of instructor. Student must have completed specific course with a B grade or better or have completed the course with a pass grade.*

199. **Special Studies (1-4)**

Supervised independent study and research in P.E. topics which are continuations of topics covered in physical fitness and health promotion minor. Student must be upper-division and in good standing (2.5 GPA). (Each individual proposal must be approved by CEP Subcommittee on Undergraduate Courses.) *Prerequisites: completion of courses in physical fitness and health promotion minor, consent of instructor, and approval of CEP Subcommittee on Undergraduate Courses.*

■ 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, and coed. Contact the Intercollegiate Athletics Office (534-4211).

PHYSICS

OFFICES:

General Administration: 3406 Mayer Hall, Revelle College

Graduate Student Affairs: 3413 Mayer Hall

Undergraduate Student Affairs: 3430 Mayer Hall

Chairman's Office: 3422 Mayer Hall

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.

E. Margaret Burbidge, Ph.D., *Emeritus,*

Astronomy

Geoffrey R. Burbidge, Ph.D.

Joseph C. Y. Chen, Ph.D.

Roger Dashen, Ph.D., *Chairman*

Patrick H. Diamond, Ph.D.

George Feher, Ph.D.

William R. Frazer, Ph.D., *Senior Vice President,*

Academic Affairs

Donald R. Fredkin, Ph.D.

John M. Goodkind, Ph.D.

Robert J. Gould, Ph.D.

F. Duncan M. Haldane, Ph.D.

Francis R. Halpern, Ph.D., *Emeritus*

Jorge E. Hirsch, Ph.D.

Norman M. Kroll, Ph.D.

Julius Kuti, Ph.D.

Herbert Levine, Ph.D.

Leonard N. Liebermann, Ph.D., *Emeritus*

Ralph H. Lovberg, Ph.D.

John H. Malmberg, Ph.D.

M. Brian Maple, Ph.D., *Bernd T. Matthias*

Endowed Chair

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Resources

Carl E. McIlwain, Ph.D.

Maurice Montal, M.D., Ph.D.

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Thomas M. O'Neil, Ph.D., *Vice Chairman,*

Education

Hans P. Paar, Ph.D.

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Oreste Piccioni, Ph.D., *Emeritus*

Sally K. Ride, Ph.D.

Marshall N. Rosenbluth, Ph.D.

Ivan K. Schuller, Ph.D.

Sheldon Schultz, Ph.D.

Lu Jeu Sham, Ph.D.

Harding E. Smith, Ph.D.

Harry Suhl, Ph.D.

Clifford M. Surko, Ph.D.

Robert A. Swanson, Ph.D.

William B. Thompson, Ph.D., *Emeritus*

Harold Ticho, Ph.D.

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

George M. Fuller, Ph.D.

Barbara Jones, Ph.D.

Oscar Lumpkin, Ph.D.

Aneesh Manohar, Ph.D.

David R. Tytler, Ph.D.

Assistant Professors

Daniel P. Arovos, Ph.D.

Daniel H. E. Dubin, Ph.D.

Frances Hellman, Ph.D.

David B. Kaplan, Ph.D.

Ann E. Nelson, Ph.D.

Jose N. Onuchic, Ph.D.

Adjunct Professors

Edward C. Creutz, Ph.D.

Alan M. Eisner, Ph.D.

Edward A. Frieman, Ph.D.

John M. Greene, Ph.D.

Roy H. Neynaber, Ph.D.

Tihiro Ohkawa, Ph.D.

Philip M. Platzman, Ph.D.

Terrence J. Sejnowski, Ph.D.

Shmuel Shtrikman, 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, Brookhaven, CERN, and Fermi Laboratory. The astrophysics program uses facilities at Lick Observatory, Mt. Lemmon, and Kitt Peak.

THE UNDERGRADUATE PROGRAM

The Department of Physics offers undergraduate programs leading to the following degrees:

PHYSICS

- 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

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.

PHYSICS MAJOR

The upper-division program for physics majors is intended to provide basic education in several principal areas of physics, with some opportunity for study in neighboring areas in the form of restricted electives. Provision is made, both in the main courses and in the elective subjects, for some training in a few of the more technological aspects of physics.

In the junior year, the emphasis is on macroscopic physics; the two principal physics subjects are electromagnetism and mechanics. The mathematics background required for the physics program is completed in this year.

In the senior year, a sequence of courses in quantum physics provides the student the modern view of atomic and some aspects of subatomic physics and the principal analytical methods appropriate in this domain. The relation of the microscopic to the macroscopic world is the subject of courses in thermodynamics and statistical physics, with illustrations drawn from gas dynamics and solid-state physics. The quantum physics sequence aims at an integrated, descriptive, and analytical treatment of those areas of physics in which quantum effects are important, particularly atomic and nuclear physics and elementary particle physics.

Students may wish to incorporate a small portion of the major program into their lower-division studies, for example, Physics 105 and Mathematics 110.

The following courses are required for the physics major:

Lower Division

1. Physics 4A-B-C-D-E and 2CL-DL.
2. Chemistry 6A 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, 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).

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105		
Phys. 110A	Phys. 110B	Phys. 120A
Math. 110	Restr. Elec.	Restr. Elec.
SENIOR YEAR		
Phys. 120B	Phys. 121 or 131	Phys. 132
Phys. 130A	Phys. 130B	Restr. Elec.
Phys. 140A	Phys. 140B	

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 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. Biology 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. Biology 101, 103, 106, 111, 131.
4. Mathematics 110.

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Biol. 131	
Phys. 110A	Math. 110	Phys. 120A
Chem. 140A	Chem. 140B	Chem. 143A
SENIOR YEAR		
Phys. 130A	Phys. 130B	Phys. 153
Phys. 120B	Chem. 131	Biol. 103
Biol. 101	Biol. 106	Biol. 111

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 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. Biology 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. Biology 101, 106, 111, 131.
4. Mathematics 110.
5. Restricted Elective: one biology course (Biology 121, 122, or 125).

Suggested Schedule

FALL	WINTER	SPRING
JUNIOR YEAR		
Phys. 100A	Phys. 100B	Phys. 100C
Phys. 105	Math. 110	
Phys. 110A	Biol. 131	Phys. 120A
Chem. 140A	Chem. 140B	Chem. 143A

SENIOR YEAR

Phys. 120B		Phys. 153
Phys. 130A	Chem. 126 or 131	Restr. Elec.
Biol. 101	Biol. 106	Biol. 111

PHYSICS MAJOR WITH SPECIALIZATION IN EARTH SCIENCES

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, Mathematics 110.

The following courses are required for the physics major with specialization in earth sciences:

Lower Division

1. Physics 4A-B-C-D-E and 2CL-DL; or Physics 2A-B-C-D and 2CL-DL (Physics 4 sequence is strongly recommended).
2. Chemistry 6A-B 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 Science 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. 105	Math. 110	Phys. 120A
Phys. 110A	Phys. 110B	ES 102
ES 101	ES 103	
SENIOR YEAR		
Phys. 120B	Restr. Elec.	Restr. Elec.
Phys. 130A		Restr. Elec.
Phys. 140A	Phys. 140B	
ES 120		

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, Mayer Hall 3430.

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, Mayer Hall 3430.

ADVISING OFFICE

Detailed information may be obtained from the Department of Physics, Undergraduate Student Affairs Office, Mayer Hall 3430, (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 stu-

dents 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. 203A (Adv. Classical Electrodynamics)
- Math. 210A (Mathematical Methods)

Winter

- Phys. 200B (Theoretical Mechanics)
- Phys. 203B (Adv. Classical Electrodynamics)
- Phys. 212A (Quantum Mechanics)

Spring

- Phys. 210A (Statistical Mechanics)
- Phys. 212B (Quantum Mechanics)
- Math. 210C (Mathematical Methods)

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); 221 (Adv. Mech.); 234 (Nonneutral Plas.); 235 (Nonlin. Plas. Th.)

Group 2: Physics 210B (Stat. Mech.); 211 (Solid State); 230A, 230B (Adv. Solid State); 236 (Many-body Th.)

Group 3: Physics 212C (Quant. Mech.); 214 (Elem. Part.); 215A, 215B (Part. & Fields); 217A, 217B (Renorm. Field Th.); 233 (Adv. Elem. Part. Th.)

Group 4: Physics 220 (Group Th.); Math. 259A, 259B, 259C (Geom. Phys.)

Group 5: Physics 206 (Biophys.); 213 (Nuc.); 216 (Atomic); 225A, 225B (Relativ.); 231 (Collision Th.)

Group 6: Physics 223A (Stel. Str.); 223B (Intrstel. Med.); 223C (Sp. Plasma); 223D (Stel. Atm. & Rad. Trans.); 223E (Gal. & Cosmol.); 223F (HE Astro.)

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 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 chairman, 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 office of their intention no later than the first week of the course.

Courses

LOWER DIVISION

The lower-division courses are usually offered in the quarters indicated below:

FALL	WINTER	SPRING
Phys. 1A	Phys. 1A	Phys. 1AL
Phys. 1B	Phys. 1AL	Phys. 1B
Phys. 1C	Phys. 1B	Phys. 1C
Phys. 1CL	Phys. 1C	Phys. 1CL
Phys. 2A	Phys. 2A	Phys. 2AL
Phys. 2AL	Phys. 2B	Phys. 2AS
Phys. 2BS	Phys. 2BS	Phys. 2B
Phys. 2C	Phys. 2CL	Phys. 2C
Phys. 2CS	Phys. 2CS	Phys. 2CS
Phys. 2CL	Phys. 2D	Phys. 2DL
Phys. 2D	Phys. 2DL	Phys. 4B
Phys. 4C	Phys. 4A	Phys. 4E
Phys. 5	Phys. 4D	Phys. 5
Phys. 10		Phys. 10
		Phys. 11

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)

1AL. General Physics Laboratory—Mechanics and Fluids (1)

Four three-hour laboratories covering statistical analysis of experimental data, viscosity and rotational motion, fluid flow, and mechanical oscillations. *Prerequisite: prior or concurrent enrollment in Phys. 1A.* (W,S)

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,S)

2A. Physics—Mechanics (4)

A calculus-based science-engineering general physics course covering vectors, motion in one and two dimensions, Newton's first and second laws, work and energy, conservation of energy, linear momentum, collisions, rotational kinematics, rotational dynamics, equilibrium of rigid bodies, oscillations, gravitation. *Prerequisites: 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)

2AL. Physics Laboratory—Mechanics and Fluids (2)

One hour lecture and three hours' laboratory. Experiments to be chosen from introduction to data reduction and error analysis, linear and rotational forces, conservation of energy and momentum, mechanical oscillations, angular momentum and moment of inertia, viscosity and rotational motion, fluid flow, and collisions. Department stamp required. *Prerequisite: prior or concurrent enrollment in Phys. 2A, 2AS, or 4A.* (F,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)

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. 2C, 2CS, or 4D.* (F,W)

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 1990-91, 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: 2AL or 2CL, prior or concurrent enrollment in Phys. 2D, 2DS, or 4E.* (W,S)

4A. Physics for Physics Majors—Mechanics (4)

The first quarter of a five-quarter calculus-based physics sequence for physics majors and students with a serious interest in physics. The topics covered are vectors, particle kinematics and dynamics, work and energy, conservation of energy, conservation of momentum, collisions, rotational kinematics and dynamics, equilibrium of rigid bodies. *Prerequisites: 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, Earth Sciences 1 (The Oceans), and Earth Sciences 4 (The Nature of the Earth) form a three-quarter sequence for general interest in science. Physics 5 satisfies the Third College physics requirement and is accepted for general science credit in Warren College. (F,S)

9. Elementary Quantitative Methods (1)

A self-paced tutorial course designed to help students acquire the basic quantitative skills necessary for any physics course. Topics covered are powers of ten, scientific notation, units of measurement, order of magnitude, and constant speed motions. (P/NP grades only.) (W) (Not offered in 1990-91.)

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).* (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)

PHYSICS

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: ECE 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. (S,F)

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. (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. Four hours' lecture. *Prerequisites:* Math. 110 or equivalent, Phys. 2D, 4E, or equivalent, Phys. 100A-B-C or equivalent, Phys. 105, Phys. 110A-B recommended. (F)

130B. Quantum Physics (4)

Observables and measurements, matrix mechanics, angular momentum and spin, the variational principle, perturbation theory. Atomic physics, Zeeman effect, spin-orbit interaction, fine structure principle. Four hours' lecture. *Prerequisites:* Phys. 105, 110A, 130A. (W)

130C. Quantum Physics (4)

Elementary nuclear physics, quantum mechanics of radiation, elementary particles and scattering. Three hours' lecture. *Prerequisites:* Phys. 100C, 130B. (S)

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)

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)

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 Biology 109.) *Prerequisite:* upper-division standing in biology, chemistry, or physics, or consent of instructor. (S)

154. Topics in Medical Physics (4)

Overview of medical imaging: X-ray detectors, X-ray computer tomography; ultrasound projection; acoustic imaging, Doppler measurement; basic principles of nuclear magnetic resonance, magnetic resonance imaging; radioactivity and decay, imaging system in nuclear medicine; hospital laboratory visits including examples of clinical cases. Four hours' lecture. *Prerequisites:* Phys. 100A, 100B, or consent of instructor. (S) (Not offered in 1990-91.)

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 the Physics of Flight (4)

The application of basic physical principles to a study of the earth's atmosphere and to aircraft flight and operations in the earth's atmosphere. Three hours' lecture. *Prerequisites:* freshman calculus, mechanics, electricity, and magnetism. (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 chairman. (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 chairman. (F,W,S)

GRADUATE

200A. Theoretical Mechanics (5)

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, ponderomotive 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)

203A. Advanced Classical Electrodynamics (4)

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.* (F)

203B. Advanced Classical Electrodynamics (5)

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.* (W)

206. Topics in Biophysics and Physical Biochemistry (4)

(Same as Biology 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. Statistical Mechanics (4)

Statistical description of physical systems; entropy and density matrix, equilibrium distributions; microcanonical, canonical, and grand canonical ensembles. Derivation of laws of thermodynamics. Ideal gas; Boltzmann, Fermi and Bose statistics, theory of dilute solutions, imperfect gas. Kinetic theory; the master equation, Boltzmann equation, applications to transport phenomena, fluctuation and dissipation, Onsager's relations. *Prerequisite: Phys. 140A-B, 152, or equivalent; Phys. 212A and concurrent enrollment in Phys. 212B.* (S)

210B. Statistical Physics (4)

Finite temperature perturbation theory. Transport theory; Kubo and Mori theories, correlation and scattering functions, fluctuation and dissipation theorem, Einstein relation. Brownian motion. Self-consistent field theory and applications. Phase transition and critical phenomena; phase diagrams, second order phase transitions, Landau theory, scaling, renormalization group. (F)

211. Solid-State Physics (5)

Basic graduate course in solid-state physics, dealing with topics such as lattice dynamics, magnetism in insulators, electronic band structure, transport phenomena and electrodynamics in metals, optical properties. *Prerequisite: Phys. 152 or equivalent.* (W)

212A-B. Quantum Mechanics (5-5)

Physical and mathematical basis of quantum mechanics, the Schrödinger equation and the quantum mechanics of one-particle system, matrices and the transformation theory of quantum mechanics, the path integral formulation of quantum mechanics, density matrix, translational and rotational invariance, angular momentum and spin, theory of scattering, approximation methods for discrete stationary states, time-dependent perturbation theory, theory of scattering, quantum theory of atomic structure, quantum theory of radiation, theory of second quantization. *Prerequisite: Phys. 130B or equivalent.* (W,S)

212C. Quantum Mechanics (5)

The Dirac equation, theory of the fine structure in the hydrogen atom, hyperfine splitting of atomic energy levels, electron and positron solutions of the Dirac equation and the hole theory, quantization of free fields, energy-momentum tensor, the interaction of the electron-positron field with the photon field, calculation of S-matrix elements in quantum electrodynamics, Feynman diagrams. *Prerequisite: Phys. 212B.* (F)

213. Theoretical Nuclear Physics (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.* (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 two-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)

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.* (F)

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.* (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, microinstabilities 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 permuta-

tion of unitary groups. *Prerequisite: Phys. 212C.* (S/U grades permitted.) (F)

221. Advanced Mechanics (4)

Advanced topics in the theory of nonlinear dynamics. *Prerequisite: Phys. 200B.* (S/U grades permitted.) (S)

222. Advanced Nuclear Physics (4)

Topics of current interest. Example: ambiguities in the nuclear two-body problem, three-nucleon systems and Faddeev equations, recent developments in the theory of nuclear matter and finite nuclei, exotic nuclei. *Prerequisite: Phys. 213.* (S/U grades permitted.) (S)

223A. 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)

223B. 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.) (W)

223C. Space Plasmas (4)

Planetary magnetospheres, the interplanetary medium, the solar wind, and comets. Application of plasma physics to solar system processes. Fluid and kinematic properties of winds. Energetic particle transport in radiation belts and the interplanetary medium. Waves and instabilities in large scale plasmas. *Prerequisites: Phys. 100C or equivalent, Phys. 151 or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (S)

223D. Stellar Atmospheres and Radiative Transfer (4)

The equation of transfer. Grey atmospheres. Absorption and emission of radiation. Radiative transfer in spectral lines. Statistical equilibrium. Radiative transfer in multi-level atomic systems. Line broadening and frequency redistribution. Approximations to the radiative transfer equation. The atmospheres of late and early type stars. Extended atmospheres. Radiative transfer in moving atmospheres. *Prerequisites: Phys. 130A-B or equivalent, Phys. 140A-B or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (F)

223E. Galaxies and Cosmology (4)

The structure and dynamics of galaxies. Active galaxies and QSO's. The large scale structure of the universe. Determination of H_0 (Hubble constant) and q_0 (the deceleration parameter). Physical cosmology: $1n N$ versus $1n S$, processes in an expanding universe. Cosmological models. Processes in the Big-Bang. Helium and deuterium production. The very early universe, inflationary models of the universe. *Prerequisite: consent of instructor.* (S/U grades permitted.) (Offered in alternate years.) (W)

223F. High Energy Astrophysics (4)

Cosmic rays, radio sources, X-ray sources, and compact objects. Electromagnetic processes such as synchrotron radiation, Compton scattering, thermal and non-thermal bremsstrahlung, pair production. Strong- and weak-interaction processes such as pion production, neutrino production, etc. *Prerequisites: Phys. 100C or equivalent, Phys. 130A-B-C or equivalent.* (S/U grades permitted.) (Offered in alternate years.) (S)

PHYSIOLOGY AND PHARMACOLOGY

225A-B. General Relativity and Cosmology (4-3)

The principle of covariance, tensors and tensor transformations in special relativity, the principle of equivalence; tensor calculus; 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)

230A. Advanced Solid-State Physics (4)

A sequel to Physics 211 for students intending to specialize in solid-state physics and related subjects. Examples of topics to be covered are electron-electron and electron-phonon interactions, superconductivity, Landau theory of Fermi liquids, surfaces, disordered systems. *Prerequisite: Phys. 211.* (S/U grades permitted.) (S)

230B. Advanced Solid-State Physics (4)

Selection of topics of current interest. Examples: magnetic and electric resonances, surface physics, superconductivity, ferroelectrics, disordered systems, phase transitions, liquid helium, ferromagnetism. Topics given in this course may vary from year to year. *Prerequisite: Phys. 211.* (S/U grades permitted.) (F)

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.) (S)

233. Advanced Elementary Particle Theory (4)

Current problems in elementary particle theory. *Prerequisite: Phys. 215A.* (S/U grades permitted.) (W)

234. Nonneutral Plasmas (4)

This course treats the physics of nonneutral plasmas. Topics include equilibrium, stability, transport, linear modes and instabilities, and the effects of strong correlation and strong magnetization. *Prerequisite: 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, closure 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 1990-91.) (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 1990-91.) (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.) (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 chairman* (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)

PHYSIOLOGY AND PHARMACOLOGY

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*
Marvin R. Brown, M.D., *Medicine*

Shu Chien, M.D., Ph.D., *AMES and Medicine*
James W. Covell, M.D., *Medicine and Bioengineering*

Wolfgang H. Dillmann, M.D., *Medicine*
Mark H. Ellisman, Ph.D., *Neurosciences*
Gregory F. Erickson, Ph.D., *Reproductive Medicine*

Ronald M. Evans, Ph.D., *Adjunct/Biology*
Darrell D. Fanestil, M.D., *Medicine*
James R. Feramisco, Ph.D., *Pharmacology and Medicine*

Theodore Friedmann, M.D., *Pediatrics*
Gordon N. Gill, M.D., *Medicine*
Mehran Goulian, M.D., *Medicine*
Phillip Groves, Ph.D., *Psychiatry*

A. F. Hofmann, M.D., Ph.D., *Medicine*
Stephen B. Howell, M.D., *Medicine*
Aaron J. Hsueh, Ph.D., *Reproductive Medicine*
Paul A. Insel, M.D., *Pharmacology*

Martin F. Kagnoff, M.D., *Medicine*
Michael Karin, Ph.D., *Pharmacology*
Jerrold M. Olefsky, M.D., *Medicine*
Morton P. Printz, Ph.D., *Pharmacology*

Samuel I. Rapaport, M.D., *Medicine*
Michael G. Rosenfeld, M.D., *Medicine*
Jerry A. Schneider, M.D., *Pediatrics*
David S. Segal, Ph.D., *Psychiatry*

Daniel Steinberg, M.D., Ph.D., *Medicine*
Palmer W. Taylor, Ph.D., *Pharmacology*
Roger Y. Tsien, Ph.D., *Pharmacology*
Wylie W. Vale, Ph.D., *Adjunct/Medicine*

Peter D. Wagner, M.D., *Medicine*
Gernot Walter, Ph.D., *Pathology*
John F. Ward, Ph.D., *Radiology*
Stephen I. Wasserman, M.D., *Medicine*

John B. West, M.D., Ph.D., *Medicine*
Tony L. Yaksh, Ph.D., *Anesthesiology*

Associate Professors

Joan Heller Brown, Ph.D., *Pharmacology, Chairwoman, Group in Physiology/Pharmacology, 1989-91*

Laurence L. Brunton, Ph.D., *Medicine/Pharmacology*

Thomas E. Carew, Ph.D., *Adjunct/Medicine*
Kenneth R. Chien, M.D., Ph.D., *Medicine*
Kiertisin Dharmasathaphorn, M.D., *Medicine*
Vincent E. Dionne, Ph.D., *Pharmacology*

John C. Khoo, Ph.D., *Adjunct/Medicine*
Ronald Kuczenski, Ph.D., *Adjunct/Psychiatry*
Hyam L. Leffert, M.D., *Pharmacology*
Odile Mathieu-Costello, Ph.D., *Medicine*

Daniel T. O'Connor, M.D., *Medicine*
Stephen J. Pandol, M.D., *Medicine*
Frank L. Powell, Ph.D., *Medicine*
Geert Schmid-Schoenbein, Ph.D., *Bioengineering*

Ajit P. Varki, M.D., *Medicine*

Assistant Professors

Kim E. Barrett, Ph.D., *Medicine*

Brian D. Guth, Ph.D., *Adjunct/Medicine*
 Kim A. Heidenreich, Ph.D., *Medicine*
 Carol L. MacLeod, Ph.D., *Medicine*
 Diana L. Marquardt, M.D., *Medicine*
 Harvey Motulsky, Ph.D., *Pharmacology*
 Robert H. Tukey, Ph.D., *Medicine/Pharmacology*

Research Biochemist

Ray C. Pittman, Ph.D., *Medicine*

THE GRADUATE PROGRAM

The graduate program offered by the Group in Physiology/Pharmacology 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 and to develop proficiency as teachers. 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 two years, the students take basic courses in cell and molecular physiology and pharmacology, organ physiology, eukaryotic regulatory biology, endocrinology, and neuroscience. 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 end of the second year of graduate study.

The graduate program is interdepartmental and interdisciplinary; it involves faculty of the Departments of Medicine, Pharmacology, Neuroscience, Reproductive Medicine, Biology, Chemistry; Scripps Institution of Oceanography; and the AMES Bioengineering Group. Physiological studies within the group span wide and diverse areas, including cardiovascular, renal, and respi-

ratory physiology, lipid metabolism and hypertension, reproductive and fetal physiology, and studies of peripheral microcirculation. Pharmacologic studies of drug action at the molecular and biochemical levels include studies of receptors (autonomic and peptidergic), genetic methods to analyze hormone-receptor interactions, endogenous hormone systems, and electrophysiological 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, pharmacology, hypertension, metabolic diseases, and molecular biology.

The graduate program in physiology and pharmacology 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. At the end of the second year, 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 preparing the dissertation, an oral defense of the thesis completes the requirement for the Ph.D. degree. Ph.D. time limit policies are pre-candidacy (four years), support (six years), and total registered time (seven years).

TEACHING

Teaching experience is an important part of the program. Students direct laboratory exercises

and discussion sections of the School of Medicine core courses.

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. (The course represents the major time commitment for graduate students in the winter quarter.) *Prerequisites: Phys./Pharm. 217, 218, 219 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)

217. Cellular and Molecular Physiology and Pharmacology (5)

This course will focus on cell physiology and eukaryotic cells. Selected topics will include: plasma membrane, cell-cell adhesion, principles of nervous system physiology and nerve transmission, ion channels, receptors, and physical biochemistry of macromolecules. (F)

218. Principles of Endocrinology, Reproduction, and Metabolism (5)

Selected topics in endocrinology with general principles of hormone action at the molecular, cellular, and organ system level will be covered. Application to an understanding of reproductive mechanisms and relationship of endocrine systems to cellular and organ system level metabolism. (F)

219. Molecular Mechanisms in Eukaryotic Regulation (3)

Modern concepts of gene physiology and biology covering all aspects from cell cycle and DNA/RNA synthesis processing and transport through viruses and molecular and cellular mechanisms to regulate gene expression. (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)

221. Selected Topics in Cardiovascular Instrumentation (2)

Basic principles of the design and use of modern cardiovascular instrumentation techniques — both laboratory and clinical — are discussed in a series of twelve seminars dealing with different problems in the cardiovascular area. Topics will range from electronic monitoring and display systems, to video and X-ray

POLITICAL SCIENCE

procedures, to system analysis and outline computational methods. *Prerequisites: Phys./Pharm. 206 and 206L and consent of instructor.* (S)

223. Inborn Errors of Metabolism (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. Receptor Mechanisms in the Action of Reproductive Hormones (3)

This course deals with the cellular and molecular basis for the action of reproductive hormones. Emphasis is placed on the role of hormone receptors and the physiological consequences of receptor-hormone interactions in the female and male reproductive systems. (F)

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)

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: Phys./Pharm. 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 Physiology/Pharmacology Program, designed to introduce Phys./Pharm. graduate students to the essential techniques employed in molecular and cellular pharmacology. *Prerequisites: OP, CBB, biochem., molec. biol. or consent of instructor.* (S)

230. Neuropharmacology and Receptor Mechanisms (3)

An examination of the molecular and biochemical bases of drug and neurotransmitter action. The fall-quarter course is devoted to receptor mechanisms, neuropharmacology, and drug action on excitable tissues. *Prerequisite: course in biochemistry.* (F)

231. Selected Topics in Pharmacology (2)

Fundamental concepts of modern biochemical and molecular pharmacology are given. Different areas covered each quarter include ion channels and pumps, membrane energetics, nucleotide cyclases, Na⁺-mediated solute transport, enzymatic protein modification and hepatic drug metabolism, chemical carcinogenesis, lipid modulators, chemotherapy, and receptor/ligand interactions. *Prerequisites: Phys./Pharm. 229, Phys./Pharm. 230, OPP, advanced biochemistry, molec. biology, or consent of instructor.* (F,W,S)

232. Introduction to Computers in Pharmacology (2)

Brief introduction to basic programming on microcomputers. Course will be limited to six students who will independently develop a moderately complex program with individual help from instructor. Lectures devoted to application of computers to research in pharmacology will be included. (S)

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)

238. Parturition and Neonatal Physiology (2)

This course provides a broad based coverage of the physiology of the birth processes as well as the unique physiology of the newborn. Included will be endocrine, biochemical, respiratory and developmental aspects as well as diseases of the periparturient and neonatal period. *Prerequisites: same as 236.* (S)

239. Practical Design and Evaluation of Biomedical Research (2)

Strategy, tactics, and critical analysis of biomedical research including 1) how to evaluate whether an idea for an experiment is worth pursuing, 2) fundamentals of experimental design, 3) experimental analysis, and most importantly, 4) how to read and critically evaluate biomedical research reports. *Prerequisite: SOM 203, equivalent, or consent of instructor.* (W)

240. Advanced Physiology (3 per Quarter)

Courses will cover aspects of advanced cardiovascular, respiratory, renal, and comparative physiology. *Prerequisites: Phys./Pharm. 206 and 206L or School of Medicine 206 and 206L.* (F,S)

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)

245. Mathematical Methods in Physiology and Pharmacology (3)

The formulation and solution of differential equations applied to basic time-dependent phenomena commonly encountered in physiological and pharmacological research will be covered. Laplace methods. *Prerequisite: college calculus.* (F)

262. Neurophysiology (4)

An overview of neurophysiological systems, emphasizing mammalian neurophysiology and related model vertebrate systems and concepts. (S)

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 (3)

A first course in statistical procedures for the medical sciences. Topics will be chosen from among paired comparisons, experimental design, quantal design, bioassay, counts, regression and correlation, analysis of variance, survivorship. Some emphasis will be given to computational techniques. *Prerequisite: high school algebra.* (W)

294. Pharmacology and Molecular Biology Journal Club (0-1)

Current literature in molecular pharmacology and molecular biology is reviewed in two separate meetings. Two papers are chosen per week for oral presentation by students. Faculty critique the student presentations. *Prerequisite: enrollment in Ph.D. program at year 2 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 proposition examination and two years of graduate work.* (F,W,S)

296. Directed Reading (1-4)

Reading of special topics under the direction of a faculty member. Exact subject matter to be arranged in individual cases. *Prerequisite: consent of instructor.*

297. Graduate Seminar (1)

For first-year graduate students and for medical students: Each week a different faculty member will discuss his or her research in the broad areas of physiology, physiological chemistry, and pharmacology. 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)

POLITICAL SCIENCE

OFFICE: Third College Humanities Building

Professors

Ellen T. Comisso, Ph.D.
Wayne A. Cornelius, Ph.D.
Peter F. Cowhey, Ph.D.
Paul Drake, Ph.D., *Chairman*
Peter A. Gourevitch, Ph.D.
Peter H. Irons, Ph.D., J.D.
Gary C. Jacobson, Ph.D.
Samuel H. Kernell, Ph.D.
Sanford A. Lakoff, Ph.D.
Arend Lijphart, Ph.D.
Roger R. Revelle, Ph.D.

Peter H. Smith, Ph.D.
Tracy B. Strong, Ph.D.

Adjunct Professors

Chalmers Johnson, Ph.D.
Miles Kahler, Ph.D.
John Ruggie, Ph.D.

Associate Professors

Nathaniel L. Beck, Ph.D.
Amy Bridges, Ph.D.
Gary Cox, Ph.D.
Ann L. Craig, Ph.D.
Steven P. Erie, Ph.D.
Harry Hirsch, Ph.D.
David R. Mares, Ph.D.
Mathew McCubbins, Ph.D.
Samuel L. Popkin, Ph.D.
Susan L. Shirk, Ph.D.

Adjunct Associate Professor

Daniel Hallin, Ph.D.

Assistant Professors

Alan C. Houston, Ph.D.
Arthur W. Lupia, Ph.D.
Victor V. Magagna, Ph.D.
Lisa L. Martin, Ph.D.
Philip G. Roeder, Ph.D.

Adjunct Assistant Professor

Tun-Jen Cheng, Ph.D.
Frances M. Rosenbluth, 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. The Revelle Social Science Sequence which consists of 10A, 10B, and 10C may be substituted for 10, 11, and 12. Political science majors who substitute the Revelle sequence for P.S. 10, 11, and 12

must take at least one upper-division course in American politics and one upper-division course in international relations. 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). 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. Joint 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 a prerequisite for honors.) These courses may be counted toward the upper-division requirement.

The variety of "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.

After a student declares political science as his or her major, he or she is encouraged to see the undergraduate adviser for a general discussion of his or her overall program.

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

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 analysts in both the public and private sectors. Many of these students pursue advanced degrees in public policy or study for a master's in business administration. Students interested in this option should look into policy analysis courses and American or comparative politics as an area of concentration. Some political science majors are interested in careers in international organization or diplomacy. These students should look into international relations as an area of concentration. In addition, a broad array of courses in comparative politics is essential for anyone interested in a career of international service. 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.

For additional career guidance students are encouraged to consult *Careers and the Study of Political Science* available in the department office.

AREAS OF CONCENTRATION

The Department of Political Science offers seven different 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,

POLITICAL SCIENCE

students to take courses in the different areas of concentration.

More detailed information on fields 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 dip-

lomatic career should become fluent in at least one foreign language.

Political Economy

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. Courses here include 144AA-AB, 144B, 102B, 126AA-AB, 138A, and 138B. The second set of courses concerns the use of the methodology associated with economic analysis in order to address political questions. Courses here include 100DA-DB and 110A. Students who wish to specialize in political economy should consult the undergraduate adviser.

Communication and Politics

The Department of Political Science has a variety of courses cross-listed with the Department of Communication. They include 100DA-DB, 102DA-DB, 102F, 102IA-IB, 112B, 112C, 124A, and 136B. Students may make communication an area of concentration within the political science major (in which case the students may substitute two communication courses for two of the upper-division political science courses), or they can major in both communication and political science.

Latin American Politics

As a field of concentration, Latin American politics is built around courses in comparative politics and international relations. P.S. 11 and 12 provide the foundations for upper-division course work. Upper-division courses are of two types: specific country studies and topical courses. On specific countries, students can choose among: 134AA-AB, 134B, 146BA-BB, 134G, and 134I. Topical courses include among others 134C, 134D, 138B, 142A, 146A, 146C, and 146D. Students should check current course offerings to update this list.

Some students may wish to concentrate especially on the politics of Mexico and U.S.-Mexican relations. This will require students to take courses across fields (international relations, American, comparative, political economy). Such a focus encourages students to take full advantage of the Center for U.S.-Mexican Studies and the center's seminars given by distinguished visiting fellows. (See below for further information.)

Students should include in their curriculum courses drawn from the general fields of international relations and comparative politics which are not focused on Latin America.

Students should also consider taking courses in linguistics, literature, sociology, or history which complement the department's emphasis on political economy. This interdisciplinary exposure is particularly important for students planning careers in journalism, business, or international civil service. Check with a faculty adviser about appropriate regional, general, and interdisciplinary courses for this field of concentration.

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, under certain circumstances, 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.

CENTER FOR UNITED STATES-MEXICAN STUDIES

OFFICE: Institute of the Americas Building
Wayne A. Cornelius, Ph.D., Director

Opened in September, 1980, the Center for U.S.-Mexican Studies has the nation's largest program of advanced research, training, and public service activities devoted exclusively to Mexico and U.S.-Mexican relations. More than fifty researchers—representing the disciplines of anthropology, demography, economics, geography, history, law, marine sciences, medicine, political science, sociology, urban studies and planning—are affiliated with the center each year. About half of these research associates are based at Mexican universities.

Research projects conducted under the auspices of the center deal with the full range of issues affecting relations between Mexico and the United States, as well as Mexico's own history and contemporary development problems. The center's research associates also examine those



aspects of the U.S. economy and society which are affected by interactions with Mexico (for example, U.S. labor markets that have large concentrations of Mexican immigrant workers).

The center serves as an integrating mechanism and informational clearinghouse for research undertaken at many different sites in the United States and Mexico. The center's interdisciplinary Research Seminar on U.S.-Mexican Relations and Mexican Development Issues attracts leading researchers from both countries who present new findings and research proposals each week to a group of twenty-five to forty Mexican specialists affiliated with the center.

Several two-day workshops focusing on specific research areas, in which the center's resident research fellows and researchers based at other institutions participate, are held each year. The center also publishes, twice yearly, an *International Inventory of Current Mexico-Related Research*, containing abstracts of research projects being conducted throughout the United States and Mexico, in all disciplines.

In addition to sponsoring or facilitating the work of individual scholars and development practitioners, the center operates its own field research unit which conducts a variety of studies dealing with Mexican migration to the United States. Ongoing projects conducted by the field research unit include a major study of economic participation, cultural integration, and health service utilization among Mexican immigrants and their children who live in the San Diego region, and a study of the utilization of Mexican labor by employers in San Diego, Los Angeles, and the San Francisco Bay area.

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 areas of the discipline. For purposes of comprehensive examinations, the field is broken into four areas: American politics, comparative politics, international relations, and political theory. Students present exams in two of these areas. In their first area, students also present a focus field (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 read-

ing 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 field"). The written focus field exam tests the student's in-depth knowledge and understanding. The focus field 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 fields; students may, with approval, craft their own focus field. 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 and many of whom probably will never take another political science course. The central question of the course is "what is democracy?" It is examined both theoretically and institutionally, by comparing the American political system with that of other countries. The basic "text" in the course 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.

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)

(Formerly P.S. 109) 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: upper-division standing or consent of instructor.*

100B. The U.S. Congress (4)

(Formerly P.S. 121) 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.

100DA. Voting, Campaigning, and Elections (4)

(Formerly P.S. 107A) (Same as Com/SF 168A.) 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.

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 exam-

ine interest group, power elite, structuralist, electoral, and cultural theories, among others. Policy case studies will be provided for evaluating alternative theories. *Prerequisite: upper-division status.*

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.

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.

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.) This course will focus on the structure, origins, and dynamics of public opinion and political ideology. P.S. 102DA 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. P.S. 102DB examines the development of political ideas in specific historical situations. *Prerequisite: 102DA for 102DB, 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.

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: a prior course in law and some economy are recommended.*

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 requires a research paper. *Prerequisites: upper-division standing. 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.

103A. California Government and Politics (4)

(Formerly P.S. 111) 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.

104A. The Supreme Court and the Constitution (4)

An introduction to the study of the Supreme Court and constitutional doctrine. Topics will include the nature of judicial review, federalism, race, and equal protection. The relation of judicial and legislative power will also be examined.

104B. Civil Liberties—Fundamental Rights (4)

This course will examine issues of civil liberties from both legal and political perspectives. Topics will include the First Amendment rights of speech, press, assembly, and religion; other "fundamental" rights, such as the right to privacy; and some issues in equal protection. Conflicts between governmental powers and individual rights will be examined.

104C. Civil Liberties—The Rights of Criminals and Minorities (4)

This course will examine the legal and constitutional issues surrounding the rights of criminal suspects, including Fourth and Fifth Amendment rights, as well as the rights of "marginal" groups, such as aliens and the mentally ill. *Prerequisite: P.S. 104A or consent of instructor.*

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.

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.

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. 100A or 100B strongly recommended.*

POLITICAL THEORY

110A. Systems of Political Thought (4)

(Formerly P.S. 100A) 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)

(Formerly P.S. 100B) 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)

(Formerly P.S. 100C) 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) The intention of this course is to address certain problems which are characteristic of the political experience of the twentieth century. Among the topics considered are revolution, the 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. The course will be topically rather than personality oriented. *Prerequisites: sophomore standing, two courses in philosophy, or political or social theory.*

110DB. Contemporary Political Thought (4)

(Formerly P.S. 102B) This course is a continuation of Political Science 110DA. It will focus on a limited number of individuals in terms of the themes developed during the previous quarter. It will lead to the writing of a research paper. *Prerequisites: sophomore standing, two courses in philosophy, or political or social theory, and P.S. 110DA.*

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. Some attention will be paid to challengers to the consensus from antebellum southern thinkers and from socialists and anarchists in later periods. Close attention will be paid to the analyses of Tocqueville and Hartz.

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. Students will be encouraged to pursue topics of particular interest, including the effort to identify and protect the rights of minorities and women, arguments over social welfare and economic policy, and questions of foreign policy in which normative beliefs are at issue.

110J. Power in American Society (4)

(Same as Sociol. 147 and HIUS 126.) This course examines the ways in which power has been conceived and contested by elites and non-elites, during the course of American history. Through the writings, speeches and biographies of contestants in these struggles, the course explores the changes which have occurred in political rhetoric and strategies as America has moved from a relatively isolated agrarian and commercial re-

public to a military and industrial empire. Topics will include: the struggle over the Constitution, antebellum reform, agrarian and labor radicalism after the Civil War, the rise of socialist and communist parties after World War I, and the multifaceted protest movements of the 60s and 70s. The course ends by considering the present in light of its continuities and discontinuities with the above traditions.

112A. Economic Theories of Political Behavior (4)

(Formerly P.S. 172) 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)

(Formerly P.S. 137) (Same as Com/SF 137.) 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)

(Formerly P.S. 138) (Same as Com/SF 125.) 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). Readings from a variety of sources and traditions; wherever possible, entire works will be read. Some attempt will be made to develop implications inherent in art for the writing of political theory as a genre. Authors include Shakespeare, Brecht, Flaubert, Conrad, Malraux, with the precise list changing from year to year.

■ 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.

120C. Politics in France (4)

The modernization of an old country with strong traditions will be studied at various levels: the consequences of social and economic change for the political culture; institutional development under a semipresidential system and their impact on policy making and on political and administrative personnel; parties and elections; novel relations between center and periphery; objectives and constraints of the "socialist experiment"; perspectives for the country's political economy.

120D. Politics in West Germany (4)

An analysis of the Federal Republic of Germany with an emphasis on the party system and executive-legislation relations. Comparisons will be made with other West European democracies, the Weimar Republic, and East Germany.

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: upper-division standing.*

123. Business, Labor, and the State (4)

What has been the role relationship between state and society: nightwatchman, guardian, something else? This course examines the different patterns of society-state relationships (liberal, corporatistic, social democratic, etc.) which have emerged in Western Europe and North America through examination of the strategies which labor movements and business formations have developed in relation to each other, in seeking assistance from the state, and conversely, the role of the state in shaping the behavior of each group. Emphasis on Western Europe, with some comparisons to the U.S. and Japan.

124A. Political Consequences of Electoral Systems (4)

(Formerly P.S. 164) A comparative survey of the major dimensions of the electoral arrangements used in contemporary democratic states, the electoral formula (majority and plurality systems, the various forms of proportional representation, and semi-proportional systems), district size, and electoral thresholds. The effects of the different electoral systems on party competition will be analyzed in terms of the relationships between votes and seats, the fragmentation or concentration of party systems, and the encouragement of electoral alliances. *Prerequisite: upper-division standing or consent of instructor.*

126AA. Fundamentals of Political Economy (4)

(Formerly P.S. 175A) The first half of the 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.

126AB. Issues in Political Economy (4)

(Formerly P.S. 175B) 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 (4)

(Formerly P.S. 141A) This course analyzes the political system of the Soviet Union. Special attention will be given to the Leninist developmental strategy as a Soviet response to the crises of modernization and an alternative to the path previously taken by Western industrial democracies. Specific topics will include the role of the Soviet citizen in politics, the policy-making process, and policy performance regarding material well-being, justice, and equity. *Prerequisite: upper-division standing 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: upper-division standing or 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.

130CA-CB. Comparative Communism (4-4)

This course will examine the theory and practice of communist parties and socialist systems. We will compare the role of government, the nature of the party, the importance of national tra-

ditions, the structure of the economy, patterns of stratification, the organization of producer groups, and responses to de-radicalization in China, the Soviet Union, Eastern Europe, and non-ruling communist movements in Europe and the Third World. The specific topics and countries covered will vary from year to year. *Prerequisites: P.S. 130AA or 130B, or consent of instructor.*

130D. Seminar: Chinese Politics (4)
(Formerly P.S. 134) This course will examine selected topics concerning major problems of political institutions, economic policy, and social change in postrevolutionary China. Students will do research projects. *Prerequisite: P.S. 130B or consent of instructor.*

130G. Vietnam: The Politics of the Village (4)
(Formerly P.S. 133A) This course will discuss the nature of Vietnamese society, especially its village structure, but also its religious, ethnic, and class divisions. Main focus is on the period of French colonialism and the origins of the Vietnamese revolution.

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.

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: upper-division standing or consent of instructor.*

133A. Introduction to Japanese Politics (4)
This course is designed to provide students with a basic grounding of modern Japanese politics. The course will first deal with the origin and evolution of political systems in modern Japan. It will then analyze in greater detail the political systems in comparative-historical perspective. *Prerequisite: upper-division standing.*

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: upper-division standing.*

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: upper-division standing.*

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: upper-division standing.*

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. 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.

134C. Peasant Movements and Agrarian Problems in Latin America (4)
This course is about the political and economic problems confronting peasants in Latin America: Why, how, and with what results have peasants participated in politics? What is the relationship between peasants and the state? Between peasants and other social classes? Topics include the political mobilization of peasants, the role of leadership and ideology in peasant movements, and peasant response to the commercialization of agriculture in two or three countries. *Prerequisite: department stamp required.*

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.

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: upper-division standing.*

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. It emphasizes democratic vs. authoritarian alternatives, including options offered by such leaders as Salvador Allende, Juan Peron, and Augusto Pinochet. The course will also examine the social and economic content and results of contrasting political experiments. *Prerequisite: upper-division standing.*

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: upper-division standing.*

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. *Prerequisites: upper-division standing and consent of instructor.*

135A. Ethnic Conflict in the Third World (4)
An analysis of the problems caused by ethnic cleavages in Third World countries and of the possibilities of conflict resolution by means of consociational methods. The principal cases that will be studied are Lebanon, Cyprus, Malaysia, and South Africa. *Prerequisite: upper-division standing or consent of instructor.*

136A. African Politics (4)
(Formerly P.S. 144) An examination of pre-and post-colonial trends in African political organization. Economic management,

dissemination of ideologies, leadership, and relations with other states will be among the topics considered.

136B. Comparative Politics and Political Culture (4)
(Formerly P.S. 154) To what extent do aspects of culture—language, religion, family, history, beliefs, and values—influence the range of political behavior in any society, or define the range of questions on its political agenda? If in some way culture has an important bearing on politics, what are the mechanisms of real political change? To what extent is political change unidirectional toward some homogeneous industrialized world, and to what extent will heterogeneous cultures develop along divergent paths? These are the seminal questions around which this course will be organized. *Prerequisite: at least one course which studies a foreign country, or equivalent experience, or consent of instructor.*

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. How have government policies and programs influenced the rural/urban and interregional disparities in population, economic development, and social welfare which exist in most countries? Topics include modernization/developmentalist approaches to the study of urbanization, as compared with dependency/neo-Marxist approaches, colonial rule as a determinant of contemporary urbanization patterns, effects of public and private investments on internal migration, the relative effectiveness of various kinds of policy instruments for controlling or rechannelling national urban growth. 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: upper-division standing or consent of instructor.*

138B. Politics of Rural Inequality (4)
(Formerly P.S. 190) What political and economic strategies have been or could be devised to deal with the problems of redistributing wealth within and to rural areas? Are such redistribution policies compatible with programs to maximize food production? What political and economic circumstances facilitate (or more often impede) implementation of such policies? Who benefits? These questions will be addressed with reference to specific policies (land reform, integrated rural development programs, resettlement schemes, commercialization of agriculture, etc.) in Latin America, Africa, and Asia.

138D. Seminar: Advanced Topics in Comparative Politics (4)
(Formerly P.S. 165) A comparative analysis of the party systems of democratic regimes and their effects on the formation of government coalitions and government stability. Special attention will be paid to the work of the major comparative theorists of party systems, from Duverger to Sartori. The theories of coalition formation to be examined include those that attempt to predict which coalition is likely to be formed and those that seek to relate cabinet stability to the type of cabinet coalition.

INTERNATIONAL RELATIONS

140A. International Law and Organizations (4)
International law and organizations are central to the efforts to create a world order to limit armed conflict, regulate the world economy and advance programs for economic redistribution among nations, and set minimum standards of human rights. This course explains the theory of international law and organization that is accepted by diplomats and compares this viewpoint to the analysis of social scientists concerning the past record and likely future of world order concerning conflict, economic redistribution, and human rights.

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: upper-division standing and consent of instructor.*

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 to underscore the complexities of the international environment which the U.S. faces. Particular emphasis will be placed on the moral dilemmas which confront the U.S. as leader of the Western industrialized nations.

142I. Comparative National Security Policies: U.S./USSR (4)

A lecture course surveying the politics and policies of defense in the United States and the Soviet Union.

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.*

144B. Comparative Responses to International Economic Crises (4)

(Formerly P.S. 169) What policies do countries select for dealing with economic problems? What political factors shape the choice among alternative policies for handling inflation, unemployment, foreign competition, exchange rates, reindustrialization, and other problems. What consequences does the controversy over economic policy have for such values as liberty, equality, peace, stability? Stress on Western Europe, North America, and Japan in the period after World War II.

144D. Political Dimensions of International Finance (4)

(Same as P.S. 262 and IP/Gen 402.) An examination of the effects of national policies and international collaboration on international finance. Three areas will receive particular attention: the question of an international lender of last resort, national regulation and influence over international financial actors in the major industrialized economies, and the role of the developing countries in the international financial system, during debt crisis and looking beyond the debt crisis. The course will consider both public international financial organizations (International Monetary Fund, World Bank, Regional Development Banks) and private financial institutions. *Prerequisite: upper-division standing or consent of instructor. Previous background in economics strongly recommended.*

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)

(Formerly P.S. 185) 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. (Offered in alternate years with P.S. 146C.)

146BA-BB. Seminar on Mexico and U.S.-Mexican Relations (4-4)

A seminar exploring fundamental sources of conflict and convergence between Mexico and the U.S. as well as current policy issues affecting bilateral relations. Determinants and consequences of U.S. and Mexican government policies toward each other are discussed. Attention to domestic development issues and politics in Mexico as they relate to U.S.-Mexican interactions, as well as aspects of the U.S. economy, society, and political system that affect Mexico. *Prerequisite: P.S. 134B or P.S. 146A or P.S. 128AA, 124AB (or consent of instructor if none of these courses has been taken).*

146C. U.S.-Latin American Relations and the International Political Economy (4)

Development of Latin America and its relationship to the U.S.-dominated international political economy. Oriented around the analysis of the industrialization process, trade, financial, and investment relations, with particular emphasis on the interaction between domestic and international factors to explain variations in national outcomes. Also examines efforts to counter the heavy presence of the U.S. by expanding regional and international factors to explain variations in national outcomes. *Prerequisites: one year economics and P.S. 144AA or AB. (Offered in alternate years with P.S. 146A.)*

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: upper-division standing.*

147A. Soviet Foreign Policy

This course analyzes Soviet international behavior over seven decades, with particular attention to the period of Soviet superpower status. We will give close attention 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: upper-division standing.*

150A. Seminar: The Political Economy of International Labor Migration (4)

(Formerly P.S. 184) A comparative survey of worker migration from Third World countries to industrialized and oil-rich countries, and the role of such labor transfers in the politics and economic development of both the labor-exporting and labor-importing countries. Topics include general theories of international labor migration, origins and evolution of such movements over time, characteristics of the migrants, effects of government policies on international labor flows, costs and benefits of the migration to various groups (individual migrants, their home communities, employers, governments, etc.), "nativist" movements, racial conflict, and other political consequences of immigration in industrialized societies. Cases to be emphasized: Mexican and Caribbean migration to the United States, Mediterranean-basin migration to Western Europe. *Prerequisite: consent of instructor.*

151. Seminar: Theories of International Relations (4)

This course will examine the efforts to develop models and theories of international relations from Hobbes to the present.

These efforts will be studied in terms of the debates which have developed around such issues as the appropriate level of analysis (systemic, state centric or individually oriented), the appropriate way to model the international system, and the interaction between economics and politics in the international system. Theories and approaches will be studied through analysis of current and historical cases. *Prerequisites: 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)

(Formerly P.S. 124A) (Same as STPA 124A.) In this course students will conduct analyses of public policy problems and decide which policy alternatives should be adopted. The problems will be drawn from fields including energy, the environment, health, and law enforcement. The purposes of this course are three-fold: to foster an appreciation of the complexity of policy problems; to teach methods for thinking about how to design better policies; and to convey some of the specific tools that analysis and policy-makers often use. *Prerequisite: upper-division standing or consent of instructor.*

160AB. Introduction to Policy Analysis (4)

(Formerly P.S. 124B) (Same as STBA 124B.) This course will emphasize the political and organizational problems of designing and implementing public policies. Students will carry out several analyses of policies. *Prerequisite: P.S. 160AA.*

162AC. Technology and Society (4)

(Formerly P.S. 105C) (Same as STPA 105C and Biology 183.) Policy issues raised by biomedical-scientific advances. The topical context varies from year to year. Included are such areas as intervention in human heredity and development, regulatory policy with respect to cancer and human population problems. Emphasis is on mechanisms for interaction of scientific expertise and other perspectives in policy making.

166B. Energy Policy and Politics (4)

(Formerly P.S. 159) Political, economic, and technological constraints on public policy responses to the energy problem will be explored. Case studies of the evolution of oil, natural gas, and nuclear policies will illustrate the argument. There will also be a discussion of the international dimensions of energy policies.

166D. Marine Policy (4)

(Formerly P.S. 161) (Same as STPA 161.) This course aims to provide a theoretical and factual framework for the study of marine policy and to examine several cases involving controversial issues. Among the issues: the porpoise-tuna controversy; manganese nodules and deep sea mining; coastal management and nuclear power; and liability for oil spills. *Prerequisite: upper-division standing 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.

■ RESEARCH METHODS

170A. Quantitative Political Science

This course is an advanced introductory course for undergraduates. Its purpose is to acquaint students with statistical

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methodology as it is used in the social sciences. Special emphasis will be placed on regression analysis, one of the most frequently used techniques in the literature. It is assumed that the student has taken Social Science 60 (or the equivalent) or has the mathematical aptitude to progress through the materials a bit faster than would be required in a true introductory course. *Prerequisite: Social Science 60 or equivalent 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.

196A-B-C. Fieldwork in U.S.-Mexican Studies (4-4-4)

Field research on some problem relevant to contemporary Mexico and/or U.S.-Mexican political-economic relations, to be conducted in Mexico or among Mexican populations in the United States, by special arrangement with director of the Center for U.S.-Mexican Studies. At the end of the second or third quarter students will write a major paper based on fieldwork experience and assigned readings. *Prerequisite: reading and speaking knowledge of Spanish is required.*

197. Field Study in Political Science (4)

Fieldwork in the local area in some aspects of politics or public policy. The project should be largely designed by the student, with faculty supervision, and should contribute to an overall understanding of the political process.

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.

210A. Systems of Political Thought (4)

(Formerly P.S. 200A) This course focuses on the development of politics and political thought in ancient Greece, its evolution through Rome; and the rise of Christianity. Readings are drawn from Plato, Aristotle, and Machiavelli. Students will attend lectures and carry out research and writing assignments designed for graduate students.

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. Marx and Marxism (4)

The course approaches three questions: What is the nature and import of Marx's contribution to social theory and social science? What does it mean to analyze the world as a Marxist? What principles of economic and political organization are explicit and/or implicit with Marxism? Requirements: five short papers plus a final exam, OR, with approval of the instructors, three short papers and a twenty-page paper. *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.*

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 visit-

ing 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. We 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. One important issue will be the similarities and differences between China and other state socialist systems. Special attention will be paid to the way economic policies are formulated and implemented through the political system. *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. Problems to be considered include the nature of centrally planned economies, the role of the communist party, how to define property rights in a socialist economy, causes and consequences of economic reform, alternative scenarios for "democratization" and other relevant issues. The course will 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)

An introductory reading seminar on Latin American politics. Its purpose is to acquaint students with leading schools of thought in the field, to provide critical perspective on premises and methodology, and identify themes for further inquiry. Specific themes will include authoritarianism, revolution, democratization, regional conflict, and the emergence of middle-level powers. Students will take an active part in discussions. An analytical paper is also required. *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 late nineteenth century to the present. Topics include: general theories of international labor migration; effects of government policies on migratory flows to the U.S.; the role of such population movements in the politics, society, and economic development of both the U.S. and labor-exporting countries; costs and benefits of the migration to various groups; "nativist" movements and other political reactions to immigration; the evolution of U.S. immigration law and policy. Comparisons with Mediterranean-basin migration to Western Europe. Material to be drawn from literatures in an-

thropology, economics, history, law, political science, and sociology.

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 of 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.*

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. Introduction to Policy Analysis (4)

In this course students will conduct analyses of public policy problems and decide which policy alternatives should be adopted. The problems will be drawn from fields including energy, the environment, health, and law enforcement. The purposes of this course are three-fold: to foster an appreciation of the complexity of policy problems, to teach methods for thinking about how to design better policies, and to convey some of the specific tools that analysis and policy-makers often use. Students will attend lectures and carry out research and writing assignments designed for graduate students.

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.

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.

■ 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 supervisory committee.

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 supervisory committee.

294. Directed Reading in Political Economy (4)

Directed reading in a selected area of political economy 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 supervisory committee.

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 supervisory committee.

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 supervisory committee.

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.

▼ P PSYCHOLOGY

ADMINISTRATIVE OFFICE: 5217 Psychology and Linguistics Building, Muir College

STUDENT SERVICES OFFICE: 1533 Psychology and Linguistics Annex

Professors

Norman H. Anderson, Ph.D.
Richard C. Atkinson, Ph.D., *Chancellor*
Elizabeth A. Bates, Ph.D.
Robert M. Boynton, 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.

PSYCHOLOGY

Jean M. Mandler, Ph.D.
Jeffrey O. Miller, Ph.D.
Donald A. Norman, Ph.D.
Vilayanur S. Ramachandran, Ph.D., M.B.B.S.
Laura E. Schreibman, Ph.D.
Ben A. Williams, Ph.D., *Chairman*

Associate Professors

James A. Kulik, Ph.D.
Harold E. Pashler, Ph.D.
Joan Stiles, Ph.D.

Assistant Professors

Gordon C. Baylis, D.Phil.
Manuel F. Gonzalez, Ph.D.
Judith C. Goodman, Ph.D.
Allen M. Osman, Ph.D.
John T. Wixted, Ph.D.

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 Associate Professor of Psychology*
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*
David Zipser, Ph.D., *Professor of Cognitive Science*

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 motivation, 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. Biology 50 cannot be used as one of the natural science courses. 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, 11, 12, 14, 15, 16, 18
Chemistry: 4, 6A, 6B, 6C, 7A, 7B, 11, 12, 13
Physics: All the 1, 2, and 3 series, 10, 11
Earth Sciences: 1, 4

2. Three quarters of university-level mathematics (not including statistics and computer courses), at least one of which must be calculus (three quarters of calculus are recommended). Accepted courses: Math. 1A-B-C or Math. 2A-B-C.

3. Introduction to computer programming (Biology 50, CSE 62B, CSE 65, Math. 71, Math. 77, AMES 5 or AMES 10 at UCSD, or equivalent).

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. 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 148
Psychology 115	Psychology 152
Psychology 129	Psychology 156
Psychology 136	Psychology 158
Psychology 137	Psychology 184
Psychology 145	

DEVELOPMENT

Psychology 101	Psychology 156
Psychology 128	Psychology 167
Psychology 136	Psychology 168
Psychology 145	

LEARNING AND BEHAVIOR ANALYSIS

Psychology 103	Psychology 154
Psychology 120	Psychology 168
Psychology 121	

PHYSIOLOGICAL PSYCHOLOGY

- | | |
|----------------|----------------|
| Psychology 106 | Psychology 159 |
| Psychology 129 | Psychology 172 |
| Psychology 137 | Psychology 179 |
| Psychology 152 | Psychology 181 |

SENSATION AND PERCEPTION

- | | |
|----------------|----------------|
| Psychology 102 | Psychology 138 |
| Psychology 116 | Psychology 159 |
| Psychology 129 | Psychology 184 |

SOCIAL PSYCHOLOGY

- | | |
|----------------|----------------|
| Psychology 104 | Psychology 155 |
| Psychology 127 | Psychology 158 |
| Psychology 148 | Psychology 162 |
| Psychology 149 | |

ADVISING

All students are strongly encouraged to choose a permanent adviser. Advisers are assigned at the Student Services Office (Room 1533, Psychology and Linguistics 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 115, 116, 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 115, 116, 121, 127)
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.

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.

MASTER'S DEGREE PROGRAM

Normally, students will be accepted only for the Ph.D. Students in the doctoral program may, however, qualify for the M.A.

Plan II has been adopted by the department (see "Graduate Studies: The Master's Degree"). Each candidate must complete a two-course requirement in quantitative methods and at least six additional graduate courses other than the research courses 296, 298, and 299. Each candidate must also pass the master's examination, which is offered by the department once each year.

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 motivation (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 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 "basic" courses from the list prepared by the Graduate Affairs Committee. Five basic seminars will be offered (one for each of the five areas). They will be offered every year and may be one to three quarters in length. Each entering student will be required to take at least one quarter in each of three areas and a total of four quarters altogether. No more than two quarters from any one of the five areas may be counted toward the basic requirement. In all, eight courses (including the basic courses) are required and 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 a 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 paper will be graded on a five-point scale: +, 0+, 0, 0-, -. Additional readers may be required when there are conflicting evaluations.
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.

By the end of the third year of study the student is expected to have completed at least eight courses from the list of courses approved by the Graduate Affairs Committee. At least three of the areas listed above must be represented. 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. The student lays out the issues of his or her interest and the most relevant readings, including the kinds of questions on which he or she would like to write. A finalized reading list and set of questions is negotiated between the student and the doctoral committee after which the student selects a week during which he or she will produce polished answers to the questions. 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 quarter. The requirement is intended to be a positive educational supplement to the course work. Part of each experimental session will be devoted to explanation and discussion of the purpose and nature of the experiment (this will usually be done at the end of the experimental session). Students always have the right to discontinue participation

at any point in any study. Students who are unable to participate or who choose not to participate will be provided alternate service assignments which are designed to serve similar educational goals.

1. Psychology (4)

A comprehensive series of lectures covering the basic concepts of modern psychology in the areas of human information processing, learning and memory, motivation, developmental processes, language acquisition, social psychology, and personality.

2. General Psychology: Biological Foundations (4)

A survey of physiological and psychological mechanisms underlying selected areas of human behavior. Emphasis will be upon sensory processes, especially vision, with emphasis also given to the neuropsychology of motivation, memory, and attention.

3. General Psychology: Cognitive Foundations (4)

This course is an introduction to the basic concepts of cognitive psychology. The course surveys the areas of memory, perception, and thinking. The course also provides an introduction to the issues of cognitive development.

4. General Psychology: Behavioral and Social 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) and to social psychology (covering such topics as emotion, aesthetics, behavioral medicine, person perception, attitudes and attitude change, and behavior in social organizations). Behavioral empiricism will be the organizing theme that will tie these areas together. Each lecture will focus on the things that researchers do to develop theories of human social behavior. The emphasis will be on experimental and quasi-experimental methods.

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.

9. Brain Damage and the Mind (4)

The purpose of the course will be to try and answer some of the following questions: Are cognitive functions sharply localized or diffusely represented in the brain? What are the brain mechanisms which lie at the basis of perception and memory, of speech and thought, of movement and action? What happens to these processes when individual parts of the brain are destroyed by disease.

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 3.0 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.*

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.*

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 experi-

mental 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.*

136. Cognitive Development (4)

Cognitive growth from birth to adolescence, including discussion of Piagetian theory and more recent approaches. Topics include: representation in infancy, concept formation and classification, representation of space and events, numerical understanding, thinking and reasoning. *Prerequisite: Psych. 101 or 105 or Cognitive Science 100.*

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.*

145. Psycholinguistics (4)

Presentation of the psychology of language, including its biological basis, its development in children, and its use by the adult. Of particular interest will be the question of the relevance of linguistic descriptions to psycholinguistics. *Prerequisite: Psych. 105.*

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.*

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.*

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. The basic experimental findings concerning attention, perception, decision making, and other neuropsychological processes and the clinical application of ERPs will be covered. An overview of brain measuring technologies such as electroencephalography (EEG), positron emission topography (PET), and neuromagnetic recordings will also be presented. *Prerequisite: Psychology 105.*

153. Clinical Psychology (4)

Major theoretical orientations in clinical psychology and their influence on concepts of mental health and abnormality, the nature of the psychotherapeutic relationship, and the conduct of psychotherapy. Techniques and interventions, including individual and group psychotherapy, play therapy, and behavior modification; specialized methods such as hypnosis, biofeedback, and art therapy. Legal and ethical issues in clinical practice. The role and responsibilities of the therapist in crises involving family violence, dangerousness, suicide risk, and disasters. *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.*

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. Such topics as identifying crime and criminals, eye witness reliability, bail setting, plea bargaining, sentencing, and parole will be critically examined in light of current psychological and criminological research. An original research project will be required as part of the course. *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.

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.

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.*

179. Drugs, Addiction, and Mental Disorder (4)

This course will consider the use, abuse, liability, and psychotherapeutic effects of drugs in man. Behavioral effects, tolerance, dependence and toxicity of marijuana, alcohol, cocaine, opiates, psychedelics, and over-the-counter drugs will be explored. Psychotherapeutic drugs are included in lectures on anxiety, sleep disorders, attentional deficit disorder, affective disorders, and schizophrenia. Lectures are supplemented by guest lectures from clinical experts in psychology and psychiatry. *Prerequisite: one lower-division psychology course (Psychology 1, 2, 3, or 4) or one upper-division psychology course; junior standing recommended.*

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.*

189. Physiology of Emotion and Motivated Behavior (4)

The course will cover the physiological and neural mechanisms underlying emotion, and motivated behaviors such as sex, aggression, feeding, and drinking. There will be an introduction to the role of neuromodulators in motivation, and an introduction to meta-theories of motivation. *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. 115 through 128), Psych. 111, a 3.0 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.

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.

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.

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.

210. Motivation and Learning (3)

Basic seminar on principles of human and animal motivation and learning.

211. Piagetian Theory (3)

Selected topics in Piaget's theory of cognitive development.

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. Cognitive Development in Infancy (3)

The course focuses on cognitive development in infancy, beginning with an examination of early neurological, sensory, motor and perceptual functions, and extending to issues in the origins of concept and symbol formation.

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 specialty. *Prerequisite:* graduate status in psychology or consent of instructor.

219. Proseminar in Learning and Motivation (3)

An overview of the experimental and applied analysis of behavior including topics such as the principles of operant and classical conditioning, stimulus control, choice, conditioned reinforcement, aversive control, biological and economic contexts, verbal behavior, and the modification of human behavior in a variety of applied settings.

220. Proseminar in Social Psychology (3)

An introduction to social psychology. Psychology and the law, health psychology, attitudes, emotions, person perception and aggression are some of the topics to be covered.

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.

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-level course aimed at practical problems of experimental analysis and substantive interpretation of data. Covers an array of topics: problems of control and confounding single-subject design and analysis; comparison between different subject groups; measurement of change and importance; choice of dependent variable; experimentation in naturalistic settings; presentation of data and writing reports; selecting a research problem. *Prerequisite:* Psych. 201A-B.

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.

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.

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.

233A-B. Topics in Learning and Motivation (3-3)

Advanced topics in learning and motivation, with special emphasis on current research. *Prerequisite:* Psych. 210.

234. Animal and Human Memory (3)

This course traces the history of research into animal and human short-term memory. Classic models, current viewpoints, and their attendant epistemological presuppositions will be considered. The relationship between empirical analyses of memory in animals and humans will also be reviewed.

235. Cognitive Psychophysiology (3)

This seminar will survey the literature on psychophysiological studies of cognitive processes. The emphasis will be on work using event-related brain potentials to study psychological processes underlying perception, thought, or action. *Prerequisite:* consent of instructor.

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. Topics will include distributed and connectionist models of memory, and current work on empirical phenomena such as levels of processing, organization and elaboration, effects of memory retrieval and interference effects. The seminar will consider the question of how well recent models can account for these experimental results. Recent approaches to working memory and short-term memory will also be considered.

241A-B-C. Advanced Topics in Cognition (4-4-4)

Research and discussion on selected topics in cognitive psychology. May be taken by undergraduate senior majors concurrently enrolled in Psychology 194. (S/U grades permitted.)

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.)

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.

RELIGIOUS STUDIES

247. The Psychology of Movement and Action (3)

This seminar will survey literature on the cognitive processes underlying movement and action. Speech, typing, sign language, and other motor activities will be considered from several theoretical perspectives. These will include approaches that emphasize motor programs, coordinative structure, and connectionist models. Although the focus will be on psychology, some relevant literature from philosophy and neuroscience will also be discussed. *Prerequisite: graduate student or consent of instructor.*

249A-B-C. Advanced Topics in Applied Behavior Analysis (3-3-3)

Research and discussion on selected topics in applied behavior analysis.

251. Advanced Topics in Learning and Motivation (3)

Weekly meetings for graduate students actively engaged in research on conditioning. *Prerequisite: consent of instructor.*

252. Seminar on Cognitive Neuroscience (3)

This is a series of weekly seminars on current trends in neuropsychology. The seminars will deal with the concept of "localization" of function in different parts of the brain and the effects of damage to these parts on cognitive functions such as perception, memory and language. Active student participation will be encouraged in preparing these seminars.

253. 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.*

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.*

259A-B-C. Advanced Seminar in Comparative Cognitive Research (3-3-3)

Advanced topics in comparative, cognitive research.

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.

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 Social Cognition (3-3-3)

Research and discussion on selected topics in social cognition.

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.)

281A-B-C. Topics in Human Information Processing (1-1-1)

Weekly seminar on advanced topics in the contemporary literature on information processing. *Prerequisite: Psych. 270C.*

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.)

David Goodblatt, *History*
Ramon A. Gutierrez, *History*
Fanny Q. Howe, *Literature*
S. Nicholas Jolley, *Philosophy*
David K. Jordan, *Anthropology*
Bennetta W. Jules-Rosette, *Sociology*
Sanford A. Lakoff, *Political Science*
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*
Melford E. Spiro, *Anthropology*
Avrum Stroll, *Philosophy*
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, and Sociology provide students with the opportunity to pursue a concentration in the field of Western religions, Asian religions, or a comparative view 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

RELIGIOUS STUDIES

Office: Fifth College, Bldg. 202 Matthews
Administrative and Academic Complex

Faculty

Henry E. Allison, *Philosophy*
Suzanne Cahill, *History*
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*
Edwin S. Fussell, *Literature*
Ali Gheissari, *Sociology*

courses include: Anthro. 22,23,24; Hist. 2A,B,C; Hist. 3A,B,C; Hist. 4A,B,C; Lit./Gen. 19A,B,C; Lit./Eng. 21,22,24; Phil. 31,32,33; Soc. 1A,B and Anthro. 22; Fifth College Making of the Modern World; Revelle College Humanities; and Judaic Studies 1A,B,C.

The Religious Studies Program 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 twelve upper-division courses:

1. Three-quarter sequence in religious traditions (HITO 100, 101, 102).
2. One quarter on methodology (Anthro. 141, 147; Phil. 103; or Soc. 156).
3. Six quarters in the related tradition of Judaism, Christianity, and Islam.
4. Two quarters from either South and East Asian religions and/or methodology.

With the addition of new faculty members specializing in Asian religions, the Religious Studies Program eventually plans to provide for the option of a concentration in Asian religions (six courses in Asian religions and two courses in Judaism, Christianity, Islam and/or methodology).

MINOR

The minor in religious studies consists of six upper-division courses. The three-quarter sequence in Religious Traditions [History Topics (HITO) 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 program would include the three-course requirement (HITO 100, 101, 102), one course in comparative disciplinary approaches (Anthro. 141 or 147, Phil. 160, Soc. 156 or 157), and two courses in a specific tradition of Western or Asian religions.

REQUIRED COURSES

HITO 100. Religious Traditions: Ancient Near Eastern Religions

HITO 101. Religious Traditions: Judaism, Christianity, Islam

HITO 102. Religious Traditions: South and East Asian Religious Traditions

RECOMMENDED COURSES

Anthropology

Anthro. 103. Chinese Popular Religion

Anthro. 141. Religion and Society

Anthro. 147. Ritual and Symbolism

Anthro. 149. Hinduism

History

HIEU 105. The Early Christian Church

HIEU 125. Reformation Europe

HIEU 162. St. Paul and the Apostolic Church

HINE 104. The Bible and the Ancient Near East

HINE 160. Special Topics in Bible and the Ancient Near East

Literature

Lit/Gr 119. New Testament Greek

Lit/He 104. The Bible and Western Literature

Lit/He 110. The Bible: Prophetic Books

Lit/He 111. The Bible: Narrative Books

Lit/He 112. The Bible: Poetic Books

Lit/He 113. Medieval Hebrew Literature

Lit/He 115. Topics in the Prophets

Lit/He 116. Topics in Biblical Narrative

Lit/He 117. Topics in Biblical Poetry

Lit/He 119. Mythology and the Bible

Philosophy

Phil. 103. Medieval Philosophy

Phil. 108. Mythology and Philosophy

Phil. 160. Philosophy of Religion

Phil. 161. Religious Existentialism

Sociology

Soc. 156. Sociology of Religions

Soc. 157. Religion in Contemporary Society

Soc. 158. Islam in the Modern World

Soc. 188H. Middle Eastern Societies

For further offerings, contact the 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. (F)*

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 10 (0 unit credit) and 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)*

Topics vary each quarter; topics recently covered:

- Contractions of the Alimentary Canal
- Neurologic Basis of Learning Disabilities
- Ice Ages and the Ocean
- Blake's Philosophy and Symbolism
- The Refrigerator and How It Works and How to Fix It
- Vietnamese Culture
- Introduction to Women's Studies
- The Physics and Metaphysics of Food
- The Greenhouse Effect from Ice Age to Present
- Human Mitochondrial Disorders
- Physiology of the Digestive System in Man

RUSSIAN AND SOVIET STUDIES PROGRAM

OFFICE: 7039 Humanities and Social Sciences Building, Muir College

Faculty

Steven Cassedy, Ph.D., *Associate Professor in Literature*

SCIENCE STUDIES

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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*

THE MINOR

Russian and Soviet studies is an interdisciplinary minor that provides a broad range of courses in the history, language, literature, and social and political life of Russia (both pre- and post-revolutionary) and the present-day Soviet Union. The minor consists of six courses, at least three of which must be upper-division. In addition, there must be at least one course from two of the three general areas of literature, history, and social science, and no more than three of the six courses can be in the language. Knowledge of the language is not a requirement for the minor, but is of course strongly recommended. A minor in Russian and Soviet studies will give a general background in this vitally important area of the world to interested students and will also provide a foundation for graduate studies in the related fields.

Courses

LITERATURE

- Lit/Ru 1A-B-C First-year Russian (4-4-4)
- Lit/Ru 2A-B-C Second-year Russian (4-4-4)
- Lit/Ru 101A-B-C Advanced Russian (4-4-4)
- Lit/Ru 110A-B-C Survey of Russian and Soviet Literature in Translation (4-4-4)
 - 110A 1800-1860
 - 110B 1860-1917
 - 110C 1917-present
- Lit/Ru 123 Single Author in Russian Literature (4)
- Lit/Ru 128 Single Author in Soviet Literature (4)
- Lit/Ru 129 Twentieth-Century Russian or Soviet Literature in Translation (4)
- Lit/Ru 130 Genres in Russian Literature (4)
- Lit/Ru 131 Russian Short Fiction (4)
- Lit/Ru 132 Russian Poetry (4)
- Lit/Ru 133 Russian and Soviet Drama (4)
- Lit/Ru 198 Directed Group Study (4)
- Lit/Ru 199 Special Studies (2 or 4)

THEATRE

- Theatre 168 History of the Russian Theatre (4)

HISTORY

- History 110A-B Russian History (4-4)
- History 110Q Special Topics in Modern Russian History (4)
- History 171 Early Soviet Social History (4)
- History 173A History of Arms Control Negotiations (4)

SOCIAL SCIENCE

- Poli. Sci. 1300AA-AB Soviet Politics (4-4)
- Sociology 188E Soviet Society (4)

SCIENCE STUDIES

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OFFICE: 7023 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, Coordinator*
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 M. 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 developing an interdisciplinary approach to understanding, interpreting, and explaining the scientific enterprise, drawing upon and integrating the perspectives developed in the history, sociology, and philosophy of science. The program offers students an opportunity to work toward such integration, 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 year-long Seminar in Science Studies, 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 209A-B-C, Philosophy 209A-B-C, Sociology 255A-B-C. Seminar in Science Studies (4-4-4)

A three-quarter sequence of readings and discussion, taught each quarter by a member of one of the departments (history, sociology, philosophy) participating in the graduate Science Studies Program. Required for 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; final grade will not be given until the end of the third quarter.) *Prerequisite: graduate standing.*

HIGR 212A-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 215. 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.

Soc. 225. Madness and Society (4)

An examination of the historical and sociological literatures on the relationship between madness and society, focusing primarily on the United States and Great Britain, but with some comparative reference to western Europe.

Soc. 236. Contemporary Topics in the Sociology of Science (4)

This seminar will cover current books and theoretical issues in the sociology of science. Topics will vary from year to year. May be repeated three times for credit.

Soc. 237. Historical Sociology of Science (4)

In recent years the sociology of science and the history of science have developed increasingly close links and shared projects. Those include the detailed naturalistic study of actual scientific practice, the analysis of the social construction of scientific knowledge in particular social settings, and the examination of relationships between the moral economy of scientific sites and the status of the knowledge produced there. Particular attention will be paid to the identity of peculiarly historical and sociological perspectives. Technical problems concerning the deployment of sociological frameworks in historical study will be addressed. Students will read and assess a range of recent work in which the connection between sociology and history of science is most evident.

Soc. 238. Relativism and the Sociology of Science (4)

A critical survey of theoretical and empirical sociological work advocating a relativist perspective on scientific knowledge. Special attention is paid to the characterization of different relativist genres, to the debates between relativism, realism and rationalism, and to the empirical grounding of relativism in studies of scientific controversy and closure.

Soc. 277. The Sociology of Technology (4)

Social theory has been largely uninterested in technology. The major exceptions are to be found in the evolutionary stories concerning "man the tool maker." The aim of the seminar is to

review the literature in paleontology, philosophy of technology, and technology on the link between tools and social theory. The idea of the seminar is to test ideas coming from sociology of technology, ethology, and evolutionary scenarios, and anthropology of tool use, in order to make room in social theory for artifacts.

Phil. 212. Contemporary Topics in the Philosophy of Science (4)

This seminar will cover current books and theoretical issues in the philosophy of science. Topics will vary from year to year. *Prerequisite: Philosophy 180, or equivalent, or consent of instructor.*

SCIENCE, TECHNOLOGY AND PUBLIC AFFAIRS

OFFICE: 1512 Galbraith Hall, Revelle College

The program offers an opportunity to study the important social policy issues that lie at the intersection of science, technology, and decision making and to develop awareness of the social and political factors that condition technology on the social order. The program will be attractive to students anticipating careers in law, administrative sciences, science, engineering, business, and international affairs. The program will serve as a meeting place for those interested in approaching policy questions from the perspective of the physical and biological sciences and for those in the social sciences having an interest in the scientific and technological component of present social, political, and environment problems.

Courses

LOWER DIVISION

69. Computers and Society (4)

(Same as CSE 69.) 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. The course has no prerequisites.

UPPER-DIVISION CORE COURSES

105C. Technology and Society (4)

(Same as Political Science 162AC.) Policy issues raised by biomedical-scientific advances. The topical content varies from year to year. Included are such areas as intervention in human heredity and development, regulatory policy with respect to cancer and human population problems. Emphasis is on mechanisms for interaction of scientific expertise and other perspectives in policy making. C. Grobstein, R. Revelle

107. Technology and Human Values (4)

(Same as Philosophy 186.) Traditional ideas of nature and the rise of science and technology. The influence of the rise of science and technology on political ideals, on human life, on freedom, on education, and on welfare. G. Anagnostopoulos

124A. Introduction to Policy Analysis (4)

(Same as Political Science 160AA.) In this course students will conduct analyses of public policy problems and decide which policy alternatives should be adopted. The problems will be drawn from fields including energy, the environment, health, and law enforcement. The purposes of this course are three-fold: to foster an appreciation of the complexity of policy problems; to teach methods for thinking about how to design better policies; and to convey some of the specific tools that analysts and policy makers often use. (Not offered in 1990-91.)

124B. Introduction to Policy Analysis (4)

(Same as Political Science 160AB.) This course will emphasize the political and organizational problems of designing and implementing public policies. Students will carry out several analyses of policies. *Prerequisite: STPA 124A or Political Science 160AA.* (Not offered in 1990-91.)

157. Technology and the Poor Countries (4)

This course treats the gap between the rich and the poor countries and the role of technology in bridging this gap. Special attention will be given to the sources of global poverty and to the importance of increased agricultural productivity and the role of the advanced countries. *Prerequisites: upper-division standing and consent of instructor.* R. Revelle

161. Marine Policy (4)

(Same as Political Science 166D.) This course aims to provide a theoretical and factual framework for the study of marine policy and to examine several cases involving controversial issues. Among the issues: the porpoise-tuna controversy; manganese nodules and deep-sea mining; coastal management and nuclear power; and liability for oil spills. R. Revelle

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 35, 119A, 119B, 119C

Communication/SF 128

Economics 130

Political Science 166B

Sociology 116

Sociology 168

SCRIPPS INSTITUTION OF OCEANOGRAPHY

OFFICE: 22 Old Scripps Bldg., Scripps Institution of Oceanography

Professors

Laurence Armii, 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*

Charles S. Cox, Ph.D., *Oceanography*

Harmon Craig, Ph.D., *Geochemistry and Oceanography*

Joseph R. Curray, Ph.D., *Geology*

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, and*

Chairman of the Department

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

Nicholas D. Holland, Ph.D., *Marine Biology*

Douglas L. Inman, Ph.D., *Oceanography*

Miriam Kastner, Ph.D., *Geology*

Charles D. Keeling, Ph.D., *Oceanography*

Devendra Lal, Ph.D., *Nuclear Geophysics*

Ralph A. Lewin, Ph.D., Sc.D., *Biology*

Peter F. Lonsdale, Ph.D., *Geology*

J. Douglas Macdougall, Ph.D., *Earth Sciences*

John A. McGowan, Ph.D., *Oceanography*

Jean-Bernard H. Minster, Ph.D., *Geophysics*

Michael M. Mullin, Ph.D., *Oceanography*

Walter H. Munk, Ph.D., *Oceanography*

William A. Newman, Ph.D., *Oceanography and Vice Chairman of the Department*

Pearn P. Niiler, Ph.D., *Oceanography*

John A. Orcutt, Ph.D., *Geophysics*

Robert L. Parker, Ph.D., *Geophysics*

Robert Pinkel, Ph.D., *Oceanography*

Joseph L. Reid, M.S., *Oceanography*

Richard H. Rosenblatt, Ph.D., *Marine Biology*

Richard L. Salmon, Ph.D., *Oceanography*

George G. Shor, Jr., Ph.D., *Marine Geophysics*

George N. Somero, Ph.D., *Biology*

Richard C. J. Somerville, Ph.D., *Meteorology*

Fred N. Spiess, Ph.D., *Oceanography*

Victor D. Vacquier, Ph.D., *Marine Biology*

Charles W. Van Atta, Ph.D., *Engineering Physics and Oceanography*

Kenneth M. Watson, Ph.D., *Physical Oceanography*

Ray F. Weiss, Ph.D., *Geochemistry*

Clinton D. Winant, Ph.D., *Oceanography*

Edward L. Winterer, Ph.D., *Geology*
 Robert S. Arthur, Ph.D., *Oceanography, Emeritus*
 Andrew A. Benson, Ph.D., *Biology, 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*
 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*
 Roger R. Revelle, Ph.D., *Oceanography, Director, Emeritus*
 Victor Vacquier, M.A., *Geophysics, Emeritus*
 Benjamin E. Volcani, Ph.D., *Microbiology, Emeritus*

Associate Professors

Duncan C. Agnew, Ph.D., *Geophysics*
 Horst Felbeck, Dr. rer. nat., *Marine Biology*
 William S. Hodgkiss, Ph.D., *Electrical Engineering*
 T. Guy Masters, Ph.D., *Geophysics*
 Jason Phipps Morgan, Ph.D., *Geophysics*
 Dean H. Roemmich, Ph.D., *Oceanography*
 David T. Sandwell, Ph.D., *Geophysics*
 George Sugihara, Ph.D., *Mathematical Ecology*
 Lynne D. Talley, Ph.D., *Oceanography*
 Lisa Tauxe, Ph.D., *Geophysics*
 William R. Young, Ph.D., *Oceanography*

Assistant Professors

Douglas H. Bartlett, Ph.D., *Marine Microbiology*
 Margo G. Haygood, Ph.D., *Marine Biology*
 Timothy D. Herbert, Ph.D., *Geology*
 John A. Hildebrand, Ph.D., *Geophysics*
 Robert E. Shadwick, Ph.D., *Marine Biology*
 Arthur J. Spivack, Ph.D., *Geochemistry*

Professors-in-Residence

Farooq Azam, Ph.D., *Biology*
 William H. Fenical, Ph.D., *Chemistry*

Adjunct Professors

Yehuda Bock, Ph.D., *Geophysics*
 Alan D. Chave, Ph.D., *Geophysics*
 Douglas P. DeMaster, Ph.D., *Oceanography*
 John R. Hunter, Ph.D., *Marine Biology*
 Michael S. Longuet-Higgins, Ph.D., *Oceanography*
 William F. Perrin, Ph.D., *Marine Biology*
 Michael R. Silverman, Ph.D., *Biology*
 Paul E. Smith, Ph.D., *Biological Oceanography*
 David J. Thomson, Ph.D., *Geophysics*

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*
 Gerald L. Kooyman, Ph.D., *Research Biologist*
 William R. Riedel, D.Sc., *Research Geologist*
 Richard J. Seymour, Ph.D., *Research Engineer*
 Kenneth L. Smith, Jr., Ph.D., *Research Biologist*
 Elizabeth L. Venrick, Ph.D., *Research Biologist*
 A. Aristides Yayanos, Ph.D., *Research Biologist*

Lecturers

Steven C. Constable, Ph.D., *Assistant Research Geophysicist*
 Andrew G. Dickson, Ph.D., *Assistant Research Chemist*
 Mark E. Huntley, Ph.D., *Associate Research Biologist*
 Richard A. Jahnke, Ph.D., *Assistant Research Geochemist*
 Scott A. Jenkins, Ph.D., *Assistant Research Engineer*
 Hubert Staudigel, Ph.D., *Assistant Research Geologist*
 Bradley M. Tebo, Ph.D., *Assistant Research Biologist*
 Geoffrey L. Vallis, Ph.D., *Assistant Research Meteorologist*
 Russell D. Vetter, Ph.D., *Assistant Research Biologist*
 Bess B. Ward, Ph.D., *Assistant Research Biologist*
 Peter F. Worcester, Ph.D., *Associate Research Oceanographer*
 Mark A. Zumberge, Ph.D., *Assistant Research Geophysicist*

Affiliated Faculty

Victor C. Anderson, Ph.D., *Professor, ECE*
 Hassan Aref, Ph.D., *Professor, AMES*
 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*

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, including the relations of ocean currents to driving forces and constraints of the ocean basins; fluctuations of currents, and the transport of properties; the mechanisms of transport of energy, momentum, and physical substances within the sea and across its boundaries; properties of wind waves, internal waves, tsunami and planetary waves; the thermodynamic description of the sea as a system not in equilibrium; optical and acoustic properties of the sea; and the influence of surf on near-shore currents and the transport of sediments.

Applied Ocean Sciences is an interdepartmental program concerned with man'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 trans-

port, 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 or chemistry.
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 the following three categories: systematics (e.g., invertebrate zoology), population biology (e.g., ecology), functional biology (e.g., embryology). 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 chemis-

try. 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 chairperson 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 210A, 240, 260, 270, 275A, 205A, 205B, 280, and one of 284, 289, 274, 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) is 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 210A, 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 210A, 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 210A, 211A-B, 212A-B, 214, 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 210A, 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 examination will be primarily oral, although written parts may be included. The student will be required to demonstrate in quantitative and analytical manner comprehension of required subject material and of the pertinent interactions of physical, chemical, biological, or geological factors.

After the student has passed the departmental examination, and has completed an appropriate

period of additional study, the department will recommend appointment of a doctoral committee. This committee will determine the student's qualifications for independent research, normally by means of a qualifying examination late in the second year of study or early in the third year, and will supervise the student's performance and reporting of his or her research.

The nature of the qualifying examination varies between curricular groups. In biological oceanography, marine biology, geological sciences, physical oceanography, and applied ocean sciences, the student will be expected to describe his or her proposed thesis research and satisfy the committee, in an oral examination, as to mastery of this and related topics. In geochemistry and marine chemistry, the student, in an oral examination, is required to present and defend a single research proposition in his or her specialized area. The student is also required to provide a written summary of the research proposition, with references, prior to the examination. In geophysics, the student presents an original research problem, in the form of a written proposition, to the candidacy committee. The student's oral presentation and defense of this proposition completes the examination.

DISSERTATION

A requirement for the Ph.D. degree is the submission of a dissertation and a final examination in which the thesis is publicly defended. We encourage students to publish appropriate parts of their theses in the scientific literature. In some cases, individual chapters are published as research articles prior to completion of the entire thesis.

DEPARTMENTAL PH.D. TIME LIMIT POLICIES

Students must 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.

ulty 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

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 142AL 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 142BL 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 142CL recommended; SIO 204B or consent of instructor.* Anderson, Hildebrand (S)

205A. Applied Parametric Statistics (4)

Methods of parametric statistics with emphasis on these procedures particularly useful in marine 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 marine 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)

210A. Physical Oceanography (4)

Physical description of the sea; physical properties of seawater, methods and measurements, boundary processes, regional oceanography. *Prerequisites: the mathematics and physics re-*

quired for admission to the graduate curriculum in the Scripps Institution of Oceanography (see text), or consent of instructor. Hendershott, Reid (F)

210B. Physical Oceanography (4)

Introduction to mechanics of fluids on a rotating earth; transport and boundary-layer phenomena, turbulent flow, and wave motion; emphasis on application to biological, chemical, and geological oceanography. *Prerequisites: SIO 210A and consent of instructor.* (S/U grades permitted.) Cox (F)

211A-B. Ocean Waves (4-4)

Propagation and dynamics of waves in the ocean including the effects of stratification, rotation, topography, wind, and nonlinearity. *Prerequisites: SIO 210A, 214.* Hendershott, Pinkel, Guza (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 214 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)

214. Introduction to Fluid Mechanics (4)

A survey of classical problems in fluid mechanics and approximate techniques of analysis. Topics include conservation equations, straight laminar flows, low and high Reynolds number laminar flow, stability of laminar flows, turbulent flow. *Prerequisite: partial differential equations.* Winant (F)

215A-B. Experimental Ocean Physics (5-5)

A lecture and laboratory course designed to present experimental aspects of physical measurements at sea and in general methods of fluid mechanics. Students will conceive, design, and conduct experiments; interpret and present written results. *Prerequisite: SIO 214 or consent of instructors.* Cox, Winant (S,F)

216A. Physics of Sediment Transport (4)

Mechanics and energetics of sediment transport by water, wind, waves, and density flows. Types of flow systems, mechanics of granular and fluid media, their interactions and transport relations; and the generation and formation of bed forms under waves and currents. Lectures, laboratory, and demonstration sessions. *Prerequisite: consent of instructors; SIO 214, 211A recommended.* Inman, Jenkins (W)

216B. Coastal Processes (4)

Coastal science and engineering for beaches, lagoons, and harbors. Coastal response to forcing by waves, winds, and runoff. Application of budget of energy and sediment to typical coastal areas including mountainous, plains, arctic, and tropical. *Prerequisite: SIO 216A or consent of instructor.* Inman, Jenkins (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 (F)

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)

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 fac-

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. 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 (W)

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; WKB 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 WKB, 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. Seminar on Essentials of Geophysics (4)

This course is intended to cover the essentials of solid-earth geophysics in a qualitative manner, but in greater detail than can be expected in an undergraduate course; the course will be based upon the text of Bott. To give students experience in presenting ideas in public the format of the class will be one in which individual students take responsibility for certain chapters of the text. (S/U grades permitted.) Parker (F)

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)

241A. Continental Margins (4)

Quaternary sediments, environments of deposition, and sedimentary processes of the continental margin, including the shore zone, continental shelf, continental slope, sedimentary basins, and base-of-slope environments. *Prerequisite:* undergraduate degree in geology or consent of instructor. (S/U grades permitted.) Curray (F)

241B. Continental Margins (4)

Structure, sedimentary facies, tectonics, origin, and geological history of passive (intraplate) continental margins. Offered in alternate years. *Prerequisite:* undergraduate degree in geology or consent of instructor. (S/U grades permitted.) Curray (S)

241C. Continental Margins (4)

Structure, sedimentary facies, tectonics, processes, and geological history of active (plate-edge) continental margins. Offered in alternate years. *Prerequisite:* undergraduate degree in geology, or consent of instructor. (S/U grades permitted.) Curray (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 Sedimentary Petrology (4)

Discussions of current research in sedimentary mineralogy, geochemistry, and petrology. The subject(s) will vary from year to year. (S/U grades permitted.) Kastner (W)

245A. Sedimentary Petrology (4)

Characteristics and origin of sediments and sedimentary rocks. *Prerequisite:* consent of instructor. Winterer (W)

245B. Sedimentary Geochemistry and Mineralogy (4)

Principles of chemical sedimentology; structure and composition of sedimentary minerals; mineral assemblages in sediments; reaction mechanisms in sediments and their geochemical applications; stable isotopes and diagenesis. *Prerequisites:* consent of instructor; mineralogy, geochemistry, sedimentary petrology, and physical chemistry are recommended. Kastner (F)

247. Rock Magnetism and Paleomagnetism (4)

Rock magnetism and acquisition of magnetic remanence in geological materials as well as laboratory procedures and data analysis (isolating remanence components and statistical approaches). The paleomagnetic literature will be used to illustrate applications in geological and geophysical problems. *Prerequisites:* one year each of college-level physics and geology; 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 210A.* (S/U grades permitted.) Craig (W)

252B. Nuclear Geophysics and Oceanography (4)

A comprehensive course on a variety of nuclear studies in geophysics and oceanography. Nuclear mechanisms including cosmic ray interactions, their rates and geophysical models will be discussed. *Prerequisite: consent of instructor.* Lal (S)

252C. Isotope Geology (4)

Radioactive and stable isotope studies in geology; geochronology; implications of isotope data for magma genesis; isotopic evolution of crust and mantle. Offered in alternate years. *Prerequisite: SIO entrance requirements or consent of instructor.* (S/U grades permitted.) Macdougall (S)

253. 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. *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 theoretical studies bearing on igneous processes are discussed and evaluated in the light of geologic occurrences. Special emphasis is given to igneous rocks of the ocean basins and their margins. Typical rock types are analyzed in the laboratory, and their history is interpreted. *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.* (S/U grades permitted.) Staff (W)

256B. Earth Sciences Spring Field Trip (1)

Classical areas of the southwestern United States, such as the Colorado Plateau, Mojave Desert, Sierra Nevada and the Peninsular Range, are examined in successive years during six-day field trips. Normally required of all first- and second-year graduate students in marine geology. (S/U grades only.) Staff (S)

256L. Laboratory Exercises in Field Geology (2)

Principles of stratigraphy and structural geology applicable to field geologic studies. Discussion and laboratory exercises. *Pre-*

requisites: consent of instructor; to be taken concurrently with SIO 256A. (S/U grades permitted.) Staff (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 ocean. Alternate years. *Prerequisite: SIO 210A, 280, or consent of instructors.* McGowan, Mullin (W)

271. Biological Oceanographic Techniques (4)

An introduction to some shipboard techniques and tools in biological oceanography and related physical and chemical measurements. Enrollment limited to ten. Alternate years. *Prerequisites: SIO 280 and 210A or consent of instructor.* (S/U grades only.) Mullin (S)

272. Biogeography (3)

A lecture course concerning the origin, development, and perpetuation of distributional patterns with emphasis on benthic marine organisms. Newman (W)

273. Professional Ethics in Science (2)

A seminar on the ethics and ethos of scientific research, based on published cases of unethical behavior. Given in alternate years. (S/U grades only.) Dayton, Mullin (W)

274. Marine Arthropods (5)

Lectures and laboratories on the natural history zoogeography, taxonomy and phylogeny of arthropods with emphasis on marine forms. Alternate years. *Prerequisite: consent of instructors.* Newman, 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 (S)

276. Quantitative Theory of Populations and Communities (6)

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 distribution and abundance of oceanic organisms and the processes regulating patterns and changes. Species, communities, and ecosystems of the oceanic realm. *Prerequisite:*

SOCIOLOGY

bachelor's degree in science or consent of instructor. McGowan, Mullin, Sugihara (F)

281. Environmental Physiology and Biochemistry of Marine Organisms (4)

Emphasis on adaptation to environmental factors such as temperature, pressure, and salinity. *Prerequisites: adequate training in biology and physical sciences, and consent of instructor.* Somero (W)

282. Physiology of Marine Vertebrates (4)

Fundamental aspects of comparative physiology. Included are studies of the physical-chemical basis of living systems and the principles and adaptations of animal function. *Prerequisite: bachelor's degree in science or consent of instructor.* Staff (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. *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 arthropods) phylum by phylum. After a brief review of fundamentals for each group, significant studies of the last five years or so will be covered. These works will cover mainly anatomy, physiology, comparative embryology, and macroevolution. *Prerequisite: graduate standing or consent of instructor.* (S/U grades permitted.) Holland (S)

289. Marine Plants (5)

An introduction to marine plants and the roles they play in the ecology of the seas. *Prerequisite: consent of instructor.* Lewin (W)

290. Ecology of Shore Microbes (4)

Laboratory investigations of the ecology, physiology, and metabolic activities of marine littoral microorganisms (bacteria, algae, fungi, and protozoa) with some field observations. Special methods for isolating and culturing selected organisms. Individual research projects. *Prerequisites: preparation in biological sciences, including biochemistry, microbiology, and comparative physiology, and chemistry and biology of the sea recom-*

mended. Upper-division undergraduates may be admitted by consent of instructor. (S/U grades permitted.) Lewin (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. Emphasis on examples from neuroscience. *Prerequisite: consent of instructor.* (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.* Nguyen-Huu Xuong (W)

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 Psych. 60, Math. 6A. (F,W,S)

SOCIOLOGY

OFFICE: 7009 Humanities and Social Sciences Building, Muir College

Professors

Bennett M. Berger, Ph.D.
Aaron V. Cicourel, Ph.D.
Fred Davis, Ph.D.
Jack D. Douglas, Ph.D.
Peter B. Evans, Ph.D., *Graduate School of International Relations and Pacific Studies*
Joseph R. Gusfield, Ph.D.
Bennetta Jules-Rosette, Ph.D.
Richard P. Madsen, Ph.D.
Timothy L. McDaniel, Ph.D., *Chairman*
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.
Jacqueline P. Wiseman, Ph.D.

Associate Professors

Rae Lesser Blumberg, Ph.D.
Stephen E. Cornell, Ph.D.
Mary Ruggie, Ph.D.
Gershon Shafir, Ph.D.
Kathryn A. Woolard, Ph.D.
Leon Zamosc, Ph.D.

Assistant Professors

Richard G. Biernacki, Ph.D.
Mounira Charrad, Ph.D.
Juan Diez Medrano, Ph.D.
Ali Gheissari, Ph.D.
Jeffrey M. Haydu, Ph.D.
Martha Lampland, Ph.D.
Akos Rona-Tas, Ph.D.
Ricardo D. Stanton-Salazar, Ph.D.
Christena Turner, Ph.D.

Adjunct Associate Professor

Mary L. Walshok, Ph.D.

SOCIOLOGY AT UCSD

Sociology studies the life of human groups: their composition, organization, culture, and development. It combines scientific and humanistic perspectives and methods to investigate a subject-matter that is both broad and relevant. At UCSD, the Department of Sociology has developed an innovative curriculum which offers courses covering the full breadth of the discipline, as well as opportunities for students to specialize in areas of their choice within the major and to participate in research projects and an Honors Program.

Students can take courses in well-known areas of sociology such as: social psychology, family patterns and relations, urban and rural life, crime and deviance, religion, work and leisure, education and socialization, social classes, law and politics, social protest and movements, health and illness, race and ethnic relations, science and technology, and problems of development and modernization.

In addition, we teach courses found in few other sociology departments across the country, such as sociolinguistics, the sociology of interaction and everyday life, art and literature, myths and symbols in society, mass media, fads and fashions, international social problems, women in world development, and sex stratification. The faculty teaches courses specializing in different contemporary societies and world regions, including Africa, China, the Middle East, Japan, Eastern Europe, India, Latin America, and the Soviet Union.

The faculty has a wide range of research interests. The department has special strengths in the comparative-historical approach to society, cognitive sociology, ethnomethodology, and the sociology of culture. All undergraduate majors have the rare opportunity to engage in field research under the guidance of faculty members—a chance to explore on their own what they have learned in the classroom. Training is available in survey research and demographic methods, as well as in newer approaches such as visual sociology. The department encourages its majors to do independent research in order to examine thoroughly a topic of their own choosing, and to take courses in other humanities and social science departments in order to broaden their perspective on sociological topics.

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 education, criminal justice, public health, urban planning, social welfare, counseling, public administration, interna-

tional 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. 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.

Transfer students should see the staff undergraduate adviser or the faculty undergraduate adviser at UCSD in order to petition to have their sociology courses from other colleges accepted to apply toward their major.

THE UNDERGRADUATE PROGRAM

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, 7, 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 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).

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. The Social Science 60 requirement became effective fall quarter 1986. Those who officially declared their sociology major through the registrar's office before this time are encouraged, but not required, to take this course.

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—seven are courses in required areas, and the other five are upper-division electives. The upper-division sociology curriculum is divided into five areas of concentration as follows:

1. **Theory and Method in Sociology** (Soc. 100-109, 181) *Method courses are numbered 103M-109.*
2. **Social Psychology, Sociolinguistics, and Social Interaction** (Soc. 110-120S, 120W, 137)
3. **Sociology of Organizations and Institutions** (Soc. 117, 118, 120W, 121-159)
4. **Sociology of Culture** (Soc. 120W, 131, 158, 160-178)
5. **Social Change, Development, and Comparative-Historical Sociology** (Soc. 127, 133, 151, 153, 154, 179-189)

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** area of concentration (Soc. 101 to 109), at least one of which must be in methods. *One* course is required in each of the other four 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.

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 chairperson and the faculty undergraduate adviser.

A 2.0 GPA is required in the major (D's and F's are not applicable, effective fall 1986). *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.

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 A+; to graduate "With High Distinction" the student must earn A; and to graduate "With Distinction" the grade must be 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. **Interactional Sociology.** The department offers courses on symbolic interaction, sociolinguistics, cognitive sociology, ethnomethodology, and the sociology of everyday life.
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 films, and the sociology of the arts, literature, film, and intellectual life.
3. **Comparative and Historical Sociology.** Faculty members have done research on India, Japan, China, Spain, Hungary, Britain, pre- and post-revolutionary Russia, the Middle East, and several Latin American countries. Substantive topics have included socioeconomic and sexual stratification, class structure, theories of development, the relationships of ideology to social change, economic organization, the origins of the modern penal system, comparative social movements, and the methodology of comparative historical research.

The goal of the program is to prepare students who will 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 year of study students have little time for individual variation because the first three quarters are spent fulfilling the basic requirements of the core curriculum. Thereafter, students have more freedom of choice.

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 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.

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, which 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 sub-disciplines 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 chairperson of the department.

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. In specialized cases, e.g., the fields of statistics, the list can be shorter.

For each of the three fields, the student should write a paper, whose length will vary depending on the field. Twenty-five pages is a suggested guideline. 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 it could also be a substantive paper displaying a broad knowledge of the field. One of the three papers should dem-

onstrate methodological competence, either in practice or through a critical discussion of the methodological literature.

Faculty members conducting the orals examinations will be chosen according to procedures determined by university policy and by departmental resolutions. In general these faculty members will also guide the student through his or her doctoral dissertation. For this reason, faculty members conducting the oral exams are formally known as the doctoral committee. The makeup of this committee is described below.

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. At least one of the members from another department must be tenured. Four of the five faculty members must hold professorial titles of any rank (the fifth member may be a lecturer with security of employment, etc.). One of the five may be from another University of California campus but the chairperson of the committee must be from the UCSD Department of Sociology. Another committee member may serve as co-chairperson. A sixth voting member of the committee may be drawn from other UCSD faculty, faculty in other universities, or nonacademic with relevant interests and expertise. According to departmental resolutions, the student will choose two of the three UCSD sociology faculty on his or her committee. The chairperson of the Department of Sociology may choose the third sociology faculty member, upon consultation with the student. The student will choose the outside members of the committee from those who are most congruent with the student's sociological interests. The composition of the doctoral committee must be approved by the chairperson of the Department of Sociology and by the dean of Graduate Studies and Research.

ORAL QUALIFYING EXAMINATION

The oral qualifying examination will be conducted by the student's doctoral committee. The aims of the examination are to test the student's knowledge of three areas of specialization, and his or her readiness to undertake further work on the tentative dissertation prospectus. Each of the examining faculty may ask questions in any of the three areas presented by the student; these questions may address fundamental issues in the field, even if these are not covered directly in the student's paper on the field. The department expects students to pass the oral qualifying examinations no later than the end of the fourth year of graduate study. The performance of those stu-

dents who fail to do so will be reviewed by the committee on graduate students, 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 is eligible to receive a candidate in philosophy degree and a master of arts degree.

DISSERTATION PROSPECTUS

Within a year of passing the orals qualifying exams, the student must have a dissertation prospectus approved by his or her committee. This prospectus must contain a description of the proposed research project, a justification of its significance and feasibility, and a discussion of the research methods that will be used. The doctoral committee will place in the student's file a written evaluation of the significance, originality, and feasibility of the proposed project.

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 prospectus the student is ready to begin research and writing. At least one of the orals papers should become part of the dissertation, possibly even an entire chapter. 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 four years. Total university support cannot exceed seven years. Total registered time at UCSD cannot exceed eight years.

GRADUATE 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 7023.

Courses

LOWER DIVISION

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.

1B. The Study of Society (4)

A continuation of Sociology 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 upon the former.

7. Modern Society (4)

(Same as Social Science 10A.) An interdisciplinary approach to the social sciences, focusing on power, equality, authority, and culture in the modern world. This course introduces theories from sociology, analyzing case studies from the United States and other societies.

10. American Society: Social Structure and Culture in the United States (4)

An introduction to American society in historical and world perspectives, touching on the following topics: the American culture tradition; industrialization, capitalism and the welfare state; careers, work and leisure; the changing forms of family and kinship stratification; the distribution of wealth, power and prestige; politics; community—national and international; ethnic and racial groups; the changing position of religion, education, the mass media and the arts; predicting future trends.

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. Topics may include: origins and growth of the world economic system, the formation of the nation-state and political modernization, industrialization and urbanization and their social consequences, the population explosion and the demographic transition, modern revolutions and nationalism, and prospects of social change in rich and poor nations. This course is required for the sociology major. (Effective fall, 1990.)

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.

90. Undergraduate Seminar (1.0)

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. *Prerequisite: freshman status. (P/NP grades only.)*

UPPER DIVISION

I. THEORY AND METHOD IN SOCIOLOGY

A. Theory

100. Classical Sociological Theory (4)

(Listed as History of Sociology prior to 1987-88.) 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.

101. Advanced General Sociology (4)

A critical examination of basic concepts of sociology; social organization, culture, structure, stratification, etc., in their relation to selected problems of analysis and research.

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: senior standing or three sociology courses.*

102T. Introduction to the Sociology of Time (4)

This course will examine the relevance of time and space in a sociological analysis, and will discuss various styles of conceptualizing topics, such as collective memory, nostalgia, subjective structure of utopian ideologies, postponement, etc. The attention will also be given to a comparative introduction of different theories and traditions of spatio-temporal awareness in world civilizations.

103T. Special Topics in Theory (4)

Reading 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.

181. Modern Western Society (4)

(Satisfies area I or area V. For course description see area V.)

B. Methods

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 MINITAB or SPSS-X statistical and data management language.

104. Field Research: Methods of Participant-Observation (4)

A basic course on the relations between sociological theory and field research. There is a strong emphasis on the theory and methods of participant observation, including a consideration of the problems of entry into field settings, recording observations, description and analysis of field data, and ethical problems in field work. Students will write a paper using these field methods.

105. Ethnographic Film (4)

This course will analyze the methods and underlying assumptions of field observation and ethnographic reporting. It will contrast written and audiovisual and ethnographies, including films and videotapes, and critically examine their styles, approaches, and uses as a form of sociological analysis. Opportunities will be provided for the application of these methods.

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.

107. Demographic Methods (4)

This course covers the methods and materials of demography, including: (1) methods of measuring fertility, mortality, and migration; (2) techniques for enumerating and estimating population size; (3) techniques for predicting the size of future population. The course will include a brief introduction to epidemiology, and explore the role of demographic explanations of social events, particularly birth, death, migration, marriage, illness, and health.

107D. Historical Demography (4)

This course will provide students with basic knowledge of various techniques used in historical demography (family reconstruction, exploitation of parish registers, among others), and of the main debated problems in the field—i.e., the demographic transition in Europe and North America. Students will have a chance, through assignments, to use these techniques. Moreover, the course will have a seminar format, in which the students will read relevant articles that will be debated in class from a theoretical and methodological viewpoint. No previous knowledge of demographic techniques is required.

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 percentage.

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, univariate, bivariate, and multivariate types of analysis, including some standard descriptive and inferential statistics. *Prerequisites: Soc. 108A, 108, and/or an introductory statistics course is recommended.*

109. Statistical Analysis of Sociological Data (4)

This course will offer a general introduction to statistical methods and data analysis for students interested in sociology.

The course will include a basic introduction to theory and practice of statistical inference, measures of association, sampling theory, and linear regression models. There will be extensive work with computer data analysis systems. The materials covered in Social Science 60, Elementary Statistics for the Social Sciences, will be assumed as the basis for this course. *Prerequisite: Social Science 60 or consent of instructor.*

■ **II. MICRO-SOCIOLOGY**

110. Human Nature in Civilization (4)

This course will deal with all the fundamental issues and knowledge about human nature. It will draw upon all of the disciplines studying human nature: genetics, the neurosciences, the behavioral biologies (ethology, sociobiology, etc.), psychology and psychiatry, history and the social sciences. It will be an attempt to communicate to students what is known (and not known) scientifically about human nature.

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.

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.

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.

114. Social Psychology of Close Personal Relationships (4)

Theories of social psychology will be applied to close personal relationships—friendships, love, family, work, and team. Idiosyncratic and generic features will be discussed. The part emotions play in relationships, problems of "balancing" relationship responsibilities, and their career over the life span will be covered.

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: one lower-division social science sequence, or upper-division standing, or consent of instructor.*

116. The Discourse of the Cold War (4)

The relationship between power and interests is explored through the concept of discourse regimes using the historical epoch known as the Cold War as the topic of investigation. The origins of Cold War discourse, its reification, routinization, and dissolution are discussed. Comparisons to other discourse regimes are made.

117. Language, Culture, and Education (4)

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. (*Satisfies area III-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. (*Satisfies area III-C.*)

119. Love (4)

This course will examine the complete range of intimate relations, from friendship to daemonic love. It will draw on all the major disciplines studying human psychology and behavior to understand these relations.

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 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 ideas, alternative approaches, etc.

120S. Special Topics in Social Psychology and Social Interaction (4)

This course will examine key issues in social psychology and the micro-sociological study of social interaction. Topics will include sociolinguistics, socialization, social cognition, and the study of personality and social interaction. Content will vary from year to year.

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. (Satisfies areas III or IV.)*

■ **III. ORGANIZATIONS AND INSTITUTIONS**

A. Economy: Studies of the Division of Labor and the Social Organization of Economic Life

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.

122. Organizational Behavior (4)

The course involves an in-depth study of various types of organizational structures, analyzed in their historical and social structural context. 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. The course will also critically consider theories and ideologies of management in bureaucratic organizations, including the "Scientific Management" of Frederick W. Taylor, the "Human Relations" school, and modern approaches.

123. Sociology of Work (4)

A comparative analysis of work in contemporary industrial economies. Topics include: the division of labor in manufactur-

ing and the changing structure of the working class, social and political consequences of skill and wage differentials, the impact of automation, bureaucratization and determinants of job satisfaction, trade unions and their strategies, industrial conflict, types of labor movements, and the relationships between unions and political parties.

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; professional and occupational associations. Prospects for the humanization of work; democratization, derationalization, deprofessionalization. Change and conflict in contemporary occupations and professions.

B. Education: Studies of Schooling and Society

117. Language, Culture and Education (4)

(*Satisfies area II or III. For course description see area II.*)

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.

C. Family and Population: Studies of Kinship, Reproduction, and the Life Cycle

118. Sociology of Sex and Gender Roles (4)

(*Satisfies area II or III. For course description see area II.*)

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.

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. (*Satisfies area III or IV.*)

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. (*Satisfies area V.*)

D. Health and Illness: Studies of the Social Organization of Medicine

135. Sociology of Health and Illness (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.

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 materials, 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.

136B. Sociology of Mental Illness: In Contemporary Society (4)

This course will focus on recent developments in the mental health sector and on the contemporary sociological literature

on mental illness. Developments in England as well as the United States will be examined.

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) Macrosociology of alcohol (manufacture, sale, consumption)—effects on society of alcoholism, the development of alcohol policies and their assessment. *(Satisfies area II or III.)*

E. Law and Social Control: Studies of Rule Making, Rule Breaking, and Rule Enforcing

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.

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.

142. Social Deviance (4)

This course studies the major forms of behavior seen as rule violations by large segments of our society and analyzes the major theories trying to explain them, as well as processes of rule making, rule enforcing, techniques of neutralization, stigmatization and status degradation, and rule change.

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.

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.

F. Politics: Studies of Power and Legitimacy

146. Social Stratification (4)

The causes and effects of social rankings in various societies. Theories of stratification; the dynamics of informal social groupings; 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.

147. Power in American Society (4)

(Same as HIUS 126.) This course examines the ways in which power has been conceived and contested by elites and non-elites during the course of American history. Through the writings, speeches and biographies of contestants in these struggles, 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. Topics will include: the struggle over the Constitution, antebellum reform, agrarian and labor radicalism after the Civil War, the rise of socialist and communist parties after World War I, and the multifaceted protest movements of the sixties and seventies. The course ends by considering the present in light of its continuities and discontinuities with the above traditions.

148. Political Sociology (4)

The contributions of sociology to the study of political systems and processes, including the analysis of the sociocultural context of political behavior and the bases of power and legitimacy.

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.

148E. Ethnicity and Politics (4)

We will consider the foundations, evolution, and types of pre-modern and modern ethnic identities. We will examine the similarities and differences between romantic nationalism, great power nationalism, fascism, national liberation, ethnic pride movements, and religious fundamentalist movements. We will focus in some detail on the recent upsurge of nationalist movements in places such as the Soviet Union and Eastern Europe in general, the Middle East as well as in developed Western societies. *(Satisfies area III or area V.)*

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. 1A and 1B.*

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.

150L. The Politics of Language and Ethnicity (4)

This course examines language policies 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.

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 (including slavery, conquest, annexation, and immigration), the maintenance of such systems of ethnic and racial dominance (discrimination, race ideologies and prejudice, structural disadvantage, suppression of revolts), the adaptation of minority communities, and the role of reform and revolutionary movements and government policies in promoting civil rights and social change. *(Satisfies area III or V.)*

152. Urban Social Problems (4)

(Same as USP 120.) Concerns the facts and theories of contemporary urban social problems in the United States. The emphasis will be on social problems, not on urbanism. Topics may include: urban poverty; inequality based on sex, age and race; crime and deviance; urban environment, pollution, housing, transportation, and health; fiscal crisis and the politics of municipal finance, including the role of ideology and interest groups in the definition of social problems.

153. The Urban Underclass (4)

(Same as USP 159.) This course focuses on the marginal peoples making up the surplus labor population in both underdeveloped countries and the United States. Theories of poverty and underemployment stressing structural factors are emphasized. The family structure, life, and employment histories of the urban poor are related to the larger political economy. *(Satisfies area IV or V.)*

154. International Social Problems (4)

A broad inquiry into the scope and sources of international social problems, including: world hunger and starvation, population growth, migration, health care, resource depletion and global ecopolitics; maldistribution of resources, modes of world food/energy production and consumption, patterns of world poverty and the international stratification system; international conflict, terrorism, and nuclear weapons. The course will include a consideration of alternative theories of global prospects and the dilemmas of policies which seek to deal with social problems that are not nation-specific. *(Satisfies area V.)*

155. American Military Strategy and Foreign Relations (4)

(Same as STPA 155.) This course will provide a basic analysis of the nature and cause of conflict and violence as well as an overview of the history of the pursuit of power by leaders of states. Also covered will be the changing nature of warfare in industrial society and a detailed discussion of the consideration of modern warfare, including present nuclear and non-nuclear conflict and strategies.

G. Religion: Studies of the Social Construction of the Sacred

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.

157. Religion in Contemporary Society (4)

This course will explore ways of approaching sacred texts, religious experiences, and ritual settings from the perspective of their construction in the world. We will examine how aspects of these phenomena can be made more fully available to sociological analysis. The course will treat also religious institutions and some background material in the analytic study of religion. Data from African religions will be used as a resource for lecture and study.

158. Islam in the Modern World (4)

This course will portray the role of Islam as a major world religion in the society, culture, and politics of the Muslim people during the nineteenth and twentieth centuries. It will study various attempts by Muslim thinkers to accommodate or reject non-Muslim rival ideologies (e.g., nationalism and socialism) in areas of political philosophy, legal theory, and ethics; it will further examine whether such responses were in accordance with original teachings and enjoyed internal consistency or represented rupture and were mere products of circumstances. Topics likely to be discussed would also include the relationship between Islam and the West, and a critical review of different stages in their reciprocal cultural recognitions.

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. *(Satisfies area III or V.)*

H. Special Topics

159. Special Topics in the Sociology of 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.

188G. Policemen, Businessmen, and Students: Japanese Organizational Cultures (4)
(Satisfies area III. For course description see area V.)

■ IV. CULTURE

131. Sociology of Youth (4)

(Satisfies area III-C or IV. For course description see area III-C.)

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.

161. Sociology of Leisure (4)

An historical and comparative analysis of conceptions of leisure, and their applicability at varying levels of social stratification. The course will also examine leisure patterns and social change.

162. Popular Culture (4)

(Same as Comm/SF 174.) An overview of the historical development of popular culture with particular emphasis on the growth of the mass media. Lectures and readings cover a variety of the forms of popular culture that have emerged from the early modern period to the present, review major theories explaining how popular culture reflects and/or affects other patterns of social behavior, and discuss the role of popular culture in general, and the mass media in particular, in contemporary society. *Prerequisite:* one lower-division sociology course, or Comm/SF 100, or consent of instructor.

163. Social Outcasts (4)

The *idea* of the social outcast. Religious outcasts, racial outcasts, moral outcasts, occupational outcasts, intellectual/artistic outcasts. The "chosen people-outcast group" paradox. The "outcast-savior" paradox. Outcast groups as "secret expressions" of the social self and as "projections" of the social imagination. Outcast groups as "utopias." "Untouchables," bohemians, "holy madmen," bandits, and other romantic delinquents, the Mafia, gypsies, and others. The social function of outcasts.

164. Advertising and Society (4)

(Same as Comm/Cul 170.) 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:* Comm/Cul 100, or one lower-division sociology course; upper-division students only, or consent of instructor.

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? Specific domains of persuasive communication to be examined will vary from year to year, but will typically include: the school curriculum as persuasion, advertising, public information campaigns and political persuasion. *Prerequisite:* Com/Cul 100 (communication majors only) or one lower-division sociology course (sociology majors).

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, Sociology 165A surveys the development of the news media as an institution, from earliest newspapers to modern mass news media. Sociology 165B deals with special

topics, including the nature of television news, and with methods of news media research, and requires a research paper.

166. Sociology of Knowledge (4)

This course will critically examine the social foundations of knowledge and its uses in society. Emphasis will be placed on: the study of social cognition and perception, comparative knowledge and belief systems, the rise of ideologies, and the social institutions affecting the development and transmission of knowledge, including universities and the mass media. Theories of the social construction of reality will also be considered.

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.

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 civilizations.

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?

168S. The Making of the Scientist (4)

A social historical and sociological examination of the development of the scientist's role from the Renaissance to the twentieth century. Who have "scientists" been and how have their activities related to those of other cultural practitioners and to the wider society? This course assesses the changing historical connections between scientists' views of nature and knowledge, the social uses of their knowledge, and the integrity and value of their role.

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 people.

171. Sociology of Art (4)

A review of sociological theories about the origins, content, and functions of art. Art as a presumed "representation" of the social order or aspects of it. Art and political systems and ideologies. Art and the "social structure." Art and "social status." The social significance of certain institutions and practices related to art, like museums and art collecting. The persistence in the modern world of artistic values developed under preindustrial and aristocratic conditions. There will be illustrations from the history of painting and sculpture in Europe and the United States.

172. Films and Society (4)

An analysis of films and how they portray various aspects of American society and culture.

173. Visual Knowledge (4)

(Same as Comm/Cul 160.) This course will cover four different uses of media images as documents of natural events: documents of families (home movies, family photographs), educational documentaries, media images for scientific research, and conventional documentary films. Classes will include discussion and lectures about characteristics of those situations in which these types of images are produced and interpreted as well as the methods people use to evaluate and interpret these

kinds of visual information. *Prerequisite:* one lower-division sociology course, or Comm/Cul 100, or consent of instructor.

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.

176. Sociology of Design (4)

(Same as Comm/SF 172.) This course will examine design as a social force. In transforming natural objects to make the human environment, people have not only cultivated and used technical skills, but also developed design traditions. We not only build houses, but certain kinds of houses; we have clothes that are styled to convey social characteristics, not just to keep us warm or protect our modesty. This course will examine how our design traditions mediated between nature and human society and how they have been used to sustain or challenge social order.

177. Understanding Life Phenomena through Sociological Concepts through Drama (4)

(Same as Theatre 177.) This course will compare, contrast, and where possible synthesize the way in which sociologists attempt to understand the complexities of behavior in human group life through the use of concepts and systematic investigation, with the way dramatists attempt to distill and portray these same emotion-wrought situations. Major sociological concepts will be discussed and portions of well-established plays will be presented by drama majors which illustrate these concepts in action. Lectures on the playwright's goals and dramatic components of the play, as well as generic applications of the concept to other areas of human group life will be offered as a catalyst to class discussion. Students will be assigned related readings in both sociology and drama.

178. Special Topics in the Sociology of Culture (4)

This course will treat themes that cross-cut the customary subdivision of the sociology of culture. It will consist of readings and discussions of particular theoretical, substantive, and research problems in this field. Topics will vary from year to year.

■ V. COMPARATIVE AND HISTORICAL SOCIOLOGY

133. Comparative Sex Stratification (4)

(Satisfies area III-C or V. For course description see area III-C.)

151. Comparative Race and Ethnic Relations (4)

(Satisfies area III-F or V. For course description see area III-F.)

153. The Urban Underclass (4)

(Satisfies area III-F or V. For course description see area III-F.)

154. International Social Problems (4)

(Satisfies area III-F or V. For course description see area III-F.)

179. Social Change (4)

A general introduction to processes of social change at different levels of analysis (micro-macro). Myths and meanings of change. Major theories of change (social-psychological, structural-functional, cyclic, developmental, conflict); dialectical and nondialectical perspectives. Sources and mechanisms of change; materialistic and idealistic perspectives, the role of technology and ideology, elites and youth, conflict and violence. Willed history: strategies of change. Major contemporary patterns and trends: the world system and social change in the twentieth century.

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.

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. Some basic themes include the growth and transformation of capitalism; the significance of the French and industrial revolutions; the culture of individualism; mass politics and mass society; and the different kinds of interplay between social structure and personal experience. (*Satisfies area I.*)

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.

183. Latin American Society through Film (4)

Using fictional film as a basis for class discussion, this course explores some major issues in Latin American social history and development. The emphasis is on ordinary people and the ways in which socioeconomic and political changes have shaped their lives and experiences.

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.

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 industrial capitalist countries affected development of Third World nations. Finally, some alternate development paths pursued by underdeveloped countries are examined.

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.

187. African Societies through Film (4)

This course provides an overview of urbanization and social change in contemporary African societies through the use of film. Three basic areas will be examined: (1) film studies of African communities in transition; (2) the comparative study of processes of social change in Africa on the local level as seen through film; and (3) the cultural and ideological codes employed in films about Africa by Africans and Western filmmakers. The images captured in these films will be analyzed as ideological ethnographic presentations of Africa, and the future prospects of African film will be assessed in terms of aesthetics, social relations, and market demand.

NOTE: Sociology 188A-E are independent courses and not part of a sequence.

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 on social change. The methods and data used in various village and community studies in Africa will be critically examined.

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.

188D. Latin America: Society and Politics (4)

(Same as IP/Gen 476.) A survey of the literature on Latin American social structures and political systems. The emphasis will be historical and comparative, and most readings will deal with the entire area or a group of countries rather than particular cases.

188E. Soviet Society (4)

Social structure and social change in the USSR since 1917. This course will focus on contrasts between the social institutions of the U.S. and the USSR. Topics likely to be considered are: politics, the economy, law and mobility, and the family. A primary theme of the course will be the implications of the centrality of the state in the USSR and of the individual in the U.S.

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.

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. (*Satisfies area III.*)

188H. Middle Eastern Societies (4)

This course will provide a basic introduction to modern Middle Eastern societies and will study their common features as well as their manifold cultural and ethnic diversities. The emphasis will be given to the nineteenth-century background, encounters with the West, erosion of many traditional structures, and the ideas of national and administrative reform. Further discussions will include the twentieth-century power politics and its role in reshaping the political geography of the region, modernization and its subsequent impacts on the social fabric and cultural climate of these societies, and the ideological composition of recent revivalist movements.

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.

189. Special Topics in Comparative-Historical Sociology (4)

Readings and discussion in selected areas of comparative and historical macrosociology. 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.

VI. SENIOR SEMINARS, HONORS COURSES, AND SPECIAL STUDIES

190. Senior Seminar (4)

A research seminar on special topics of interest to available staff provides majors and minors in sociology with research experience in close cooperation with faculty. *Prerequisites: senior standing plus three sociology courses or consent of instructor. May be repeated for credit provided that the student take seminars on different topics.*

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.

196B. Honors Seminar: Supervised Thesis Research (4)

This seminar will provide Honors candidates with the opportunity to complete research on and preparation of a senior Honors thesis under close faculty supervision.

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: upper-division standing and permission of the department. (P/NP grades only.)*

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: upper-division standing and permission of the department. (P/NP grades only.)*

GRADUATE

200. Pre-Modern Sociological Theory (4)

Major figures and their ideas in the history of social thought prior to the late nineteenth-century classicists.

201A-B. Classical Sociological Theory (4-4)

A comparative examination of major themes of such classical sociological theorists as Marx, Durkheim, Weber, Simmel, G.H. Mead, and Park.

202. Contemporary Sociological Theory (4)

Major trends in American and European sociological theory since World War II with particular emphasis on such schools as structural functionalism, symbolic interaction, ethnomethodology, structuralism, and neo-Marxism.

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.

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.

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.

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.

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.

208. Orientation to Faculty (4)

An introduction to 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.

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.

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 arillness.

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.

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.

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.

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.

216. Sociology of Culture (4)

The history of the concept of culture as the cultivation of symbolic distinctiveness in human groups; cultural pluralism in advanced industrial societies; the differentiation of cultural institutions: art, science, education and communication as profit and nonprofit-making enterprises; cultural policy and social structure; culture as a property of social groups; conflict and accommodation over efforts to change and sustain traditional culture.

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.

219. Symbolic Interactionism (4)

Principal topics to be treated in this seminar are: the philosophical roots of symbolic interactionism in American pragmatism, especially in the writings of Peirce, James and Dewey; the substantive, methodological and epistemological corpus of symbolic interactionism as exemplified in the works of George Herbert Mead and Herbert Blumer; major critiques of symbolic interactionism and counter-critiques; new directions in contemporary symbolic interactionism as shaped by responses to challenges emanating from such other interpretative sociologies as phenomenology, structuralism, semiotics, and ethnomethodology.

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.

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?

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.

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.

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.

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.

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.

231. Advanced Studies in Contemporary Theory, Part II (4)

This seminar will focus on microsociological theory and ethnomethodological studies of the local production of order in and as ordinary society. Lectures will concentrate on some consequential findings that are distinctive to ethnomethodological studies. These findings include several identifying issues of the problem of social order. In these findings, ethnomethodology is carrying out sociology's vision of the problem of order by re-specifying the ordinary society. Perhaps ethnomethodology's findings thereby point to its past developments for the classic social sciences by specifying them, contra the sciences, as professional social analysis in and as ordinary society.

232. Advanced Issues in the Sociology of Knowledge (4)

This seminar examines the social construction and acquisition of "knowledge" in society and the social institutions in which these processes take place. It investigates the foundations of "knowledge" in society, its structuring through social interaction, and the relationship between knowledge and social institutions. The seminar also examines contrasting theories of knowledge found in sociological, semiotic, and anthropological studies. Emphasis will be placed on the analysis of specialized and folk theories of knowledge and group ideologies in historical context. The objective of this seminar is to develop a corpus of interdisciplinary concepts and tools for the critical analysis of knowledge, its use, and its dissemination in society.

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.

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 from credit.

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 projects 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.

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 ra-

TEACHER EDUCATION PROGRAM

tionalism, and to the empirical grounding of relativism in studies of scientific controversy and closure.

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.

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 organization structures.

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 or organization settings.

245. Comparative Welfare States (4)

(Same as IP/Gen 452.) This course first examines the growth of the welfare state in the advanced industrial societies and studies a variety of welfare state models. It then investigates the nature of current tensions in contemporary welfare states and considers their future implication. Finally, it assesses possibilities for developing forms of social provision in newly emerging welfare states. Among the major issues discussed are: various roles of the state in social provision, and decentralization and privatization of welfare state functions.

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.

255A-B-C. Seminar in Science Studies (4-4-4)

(Same as Phil. 209A-B-C and Hist. 209A-B-C.) 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 Program in Science Studies. Required for 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.

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.

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.

265. Comparative Social Policy (4)

A macrosociological and comparative perspective of the field of social policy analysis, with an empirical focus on social security, health, welfare, and labor market policies. The course examines these policies in different national contexts to understand both the variety of policy forms and the factors that support alternative policy choices. It also considers the impli-

cations of various policies for changes in the role of the state and the private sector in social provision.

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.

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.

275. Computer Analysis of Large Data Sets (4)

Students in this course will learn how to use the computer to copy, modify, and analyze large data sets which were produced by themselves or by outside agencies. Most analyses will be conducted with SPSS-X, but subsidiary analyses will be performed with FORTRAN and with MINITAB when this is more efficient. Although the technical aspects of computer analyses will be taught, students will also learn more generally how to develop a thoughtful, rather than a mechanical application of computer techniques.

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 artefacts.

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.

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.)

298. Independent Study (1-4)

Tutorial individual-guides study and/or independent research in an area not covered by present course offerings. (S/U grades permitted.)

299. Thesis Research (1-2)

Open to graduate students engaged in thesis research. (S/U grades permitted.)

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.

SUBJECT A

For information about satisfying the Subject A requirement, especially prior to enrollment, please refer to "Subject A: English Composition" in the catalog section, "Academic Regulations."

Students who have not satisfied the Subject A requirement before enrolling at UCSD must satisfy the requirement by achieving a grade of C or better in SDCC 1 (English Composition—Subject A) and by passing the Subject A Exit Examination given at the end of SDCC 1. That examination is administered by the Subject A Program office. Students must enroll in SDCC 1 (or ESL) during the first quarter of residence at UCSD. SDCC 1 is a Mesa College course taught at UCSD as part of a cooperative program with the San Diego Community College District.

Under Academic Senate regulations, SDCC 1 cannot be counted towards graduation requirements; however, the course units do count as workload credit towards the minimum progress requirement and eligibility for financial assistance.

For further information about the Subject A requirement or the Proficiency Test, please visit the Subject A Program office, 1004 Humanities and Social Science Bldg., or call (619) 534-6177.

TEACHER EDUCATION PROGRAM

OFFICE: Building 519, Matthews Administrative and Academic Complex

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*
Frederick Olafson, Ph.D., *Professor of Philosophy*

Associate Professors

Barbara Tomlinson, Ph.D., *Associate Professor of Literature*

Kathryn A. Woolard, Ph.D., *Lecturer, Associate Professor of Sociology*

Assistant Professor

Marcelo M. Suarez-Orozco, Ph.D., *Assistant Professor of Anthropology*

Lecturers

Calvin A. Colarusso, M.D., *Clinical Professor of Psychiatry; Lecturer, Teacher Education*

Kim A. Cooley, M.A., *Lecturer, Supervisor, Teacher Education*

Gloria Fimbres, *Lecturer, Supervisor, Teacher Education*

Joanie Janis, M.A., *Lecturer, Supervisor, Teacher Education*

Ann Kailani Jones, Ph.D., *Associate Supervisor of PE and Lecturer, Teacher Education*

Cynthia Lawrence-Wallace, Ph.D., *Lecturer, Supervisor, Teacher Education*

Paula F. Levin, Ph.D., *Graduate Adviser and Lecturer, Teacher Education*

Joe Smith, M.S., *Lecturer, Supervisor, Teacher Education*

Randall Souviney, Ph.D., *Lecturer, Associate Coordinator*

Daryl Stermon, M.A., *Lecturer, Supervisor, Teacher Education*

The Teacher Education Program (TEP) at UCSD offers the California Multiple Subjects Credential (elementary), the Multiple Subjects: Bilingual Emphasis Credential, and a Single Subject Internship Credential (secondary) in mathematics or science. The main focus of TEP is multicultural education. In addition to mastering the subject matter they will teach and developing a repertoire of teaching practices, we ask prospective teachers to become familiar with the impact that culture, language, social structure, and educational technology have on the education of the students they teach. To accomplish this goal, we examine the cultural context of schooling, compare the often implicit cultural and linguistic demands of school contexts with those of the community and workplace. We encourage teachers to construct learning environments in which students' cultural knowledge and language can be used as valuable educational resources.

THE ELEMENTARY MULTIPLE-SUBJECTS CREDENTIAL PROGRAM

SELECTION OF TEACHER CANDIDATES

In general, applicants will be admitted to the credential program as non-degree graduate students. Applicants will apply during the spring quarter in their senior year to begin the program in the fall quarter. The application deadline is May 1. Students first must complete a major at UCSD before entering the program. Students from other universities must have a major equivalent to a degree offered at UCSD or be a graduate of another University of California campus. Undergraduates must have completed all of their major requirements, four-fifths of the diversified area requirements, and certain prerequisite courses to apply. All candidates must also take the California Basic Skills Test (CBEST) prior to acceptance in the program. Other criteria for admission to the multiple subjects credential program include evidence of:

1. A strong interest in multicultural approaches to education; a strong desire to improve the quality of American education; a strong desire to develop responsible, self-activated attitudes for learning children.
2. Experience working with children in educational environments, especially in multicultural settings.
3. Involvement in a range of community development activities.
4. Academic excellence (students must project a 3.0 upper-division GPA prior to application).

Each prospective candidate for the Teacher Education Program is carefully reviewed by a committee composed of faculty, local public school educators, and TEP alumni.

UNDERGRADUATE PREREQUISITES

The subject matter waiver program provides the elementary credential candidate with the subject matter knowledge needed to teach all content areas in the curriculum. Successful completion of this program of study "waives" the Commission on Teacher Credentialing's requirement of students' passing the National Teachers' General Knowledge Exam. The required courses should be largely completed prior to starting the graduate professional preparation component of the program. The candidate must take a minimum of

five four-quarter unit courses in each of the following areas:

1. Mathematics, science, and computer applications
2. English and literature (i.e., linguistics, humanities, literature, communications, and writing)
3. Social sciences (Soc. 117, Psych. 130, Soc. 126, TEP 193, TEP 181B will satisfy this requirement)
4. Humanities (i.e., foreign languages, fine arts, philosophy, theatre, music, Third World studies, political science, and history)

An approved history, political science, or equivalent course or examination must be completed to satisfy the U.S. Constitution requirement. College general-education requirements at UCSD satisfy many of the waiver program requirements.

In addition, five prerequisite courses must be completed prior to acceptance to the program. These courses may also qualify as part of a minor in teacher education (see the TEP credential coordinator for details):

1. Sociology 117: Language, Culture, and Education
2. Sociology 126: Social Organization of Education
3. TEP 181 A-B-C: Practicum in Learning

GRADUATE PROFESSIONAL PREPARATION

Table 1 shows a typical schedule leading to the Clear Multiple Subjects Credential. The credential program consists of eight TEP courses and student teaching (TEP 180A-B), all undertaken at the graduate level.

TEP also offers a Bilingual Emphasis option within the framework of the Multiple Subjects Credential designed for students capable of conducting instruction in two languages. While this emphasis is suitable for all students with expertise in English and any other language, Spanish-English is the only emphasis currently offered because of the faculty expertise within TEP and the immediate needs of the San Diego community. Students who complete this option will receive a Multiple Subjects Credential which specifies a Bilingual Emphasis. TEP does not currently offer the Single Subject, Bilingual Credential.

TEACHER EDUCATION PROGRAM

TABLE 1

Typical Schedule

PREREQUISITE COURSES

FALL	WINTER	SPRING
TEP 181A Soc. 117	TEP 181B Soc. 117	TEP 181C Soc. 126

CREDENTIAL PROGRAM COURSES

FALL	WINTER	SPRING
TEP 162	TEP 191B	TEP 191C
TEP 191A	TEP 177	TEP 180A
TEP 193	TEP 172	TEP 178
	TEP 192*	

FALL

TEP 180B
TEP 189*

*Bilingual Emphasis option

Note: Soc. 117, Soc. 126, TEP 162, TEP 177, TEP 181A, and TEP 181B can also be taken during the summer.

THE SECONDARY SINGLE SUBJECT INTERNSHIP CREDENTIAL PROGRAM

TEP offers a Single Subject Internship Credential for students desiring to teach mathematics or science in California public secondary schools. Students who have completed a B.A. or B.S. with a major in mathematics or science and certain prerequisite courses may apply for admission to the program. Upon successfully completing the course work and the internship field experience, the candidate will be recommended for the California Single Subject Credential in mathematics, life sciences, or physical sciences.

Students apply in the spring quarter of their senior year (after having taken five prerequisite courses) for formal acceptance into the program starting in the summer. Once students are selected, an intensive program of pedagogical instruction is undertaken during the summer. Each student is also interviewed for a paid internship in a local district. Interns are responsible for teaching up to a full load of mathematics and/or science courses under the guidance of a university supervisor and an onsite intern adviser and administrator. Interns receive a salary from the district of approximately 80 percent of a beginning teacher's salary, prorated by the number of classes taught; interns normally teach three to four classes per day which is approximately one-half of a normal teaching load. Participation in a full-time summer program of methods courses is required. Seminars offered in the evening throughout the year address topics which include classroom management, classroom computer-use, health education, mainstreaming special-needs students, and advanced teaching practices.

SUBJECT MATTER PREPARATION

The student pursuing a secondary credential must earn a B.A. or B.S. with a major in mathematics or one of the sciences (students must project a 3.0 upper-division GPA prior to application), satisfy UCSD's subject matter waiver program in mathematics, life science or physical science, or pass the appropriate National Teacher Specialty Examination (math-630; biology and general sciences-680; and chemistry, physics and general sciences-630), pass the California Basic Educational Skills Test, and complete the U.S. Constitution requirement (appropriate course or examination).

UNDERGRADUATE

PREREQUISITE COURSES

Undergraduates are required to complete two prerequisite education foundations courses and three pre-internship field experiences. These prerequisite courses are generally taken during the junior and senior years (six approved TEP courses also qualify as a minor):

1. Sociology 117: Language, Culture, and Education
2. Sociology 126: Social Organization of Education
3. TEP 171 A-B-C: Pre-Intern Practicum in Learning

GRADUATE PROFESSIONAL PREPARATION

Table 2 shows a typical schedule leading to the Professional Clear Single Subject Internship Credential. The credential program consists of seven TEP courses and the Internship Field Experience (TEP 170A-B-C), all undertaken at the graduate level.

TABLE 2

Typical Schedule

PREREQUISITE COURSES

FALL	WINTER	SPRING
TEP 171A Soc. 117	TEP 171B Soc. 117	TEP 171C Soc. 126

CREDENTIAL PROGRAM COURSES

SUMMER	FALL	WINTER	SPRING
TEP 162	TEP 170A	TEP 170B	TEP 170C
TEP 174/175	TEP 193	TEP 172	TEP 178
TEP 176			
TEP 177			

CLASSROOM TEACHING ASSISTANT PROGRAM

The UCSD Classroom Teaching Assistant Program enables students to volunteer as classroom pre-student teachers and pre-interns in elementary and secondary schools. The program provides a vehicle for students to gain practical experience about the learning process in actual classrooms and relate this experience to theories of interpersonal relations, cross-cultural communication, and education. The courses in this program are open to all UCSD students. Credential candidates must serve as pre-student teachers for a total of three quarters (see TEP 171A-B-C and 181A-B-C course descriptions).

THE MINOR PROGRAM

The Teacher Education Program offers a minor in teacher education which can be fulfilled through the colleges. Details can be obtained from the college academic advisers or from the TEP credential coordinator.

THE GRADUATE DEGREE PROGRAM

The teaching and learning course group offers a course of study leading to a master of arts degree. The goal of the M.A. program at UCSD is to address issues of the quality of public education by instilling in professional educators the research and pedagogical skills necessary to develop curriculum and conduct basic research on the educational circumstances they confront. Students can select from two M.A. options: curriculum design research and educational research.

ADMISSIONS

Graduate students apply during the spring quarter for admission in the summer. Applicants must make the following submissions no later than April 15 for *both* programs.

1. Submit to the Office of Graduate Studies and Research (Q-003), University of California, San Diego, La Jolla, CA 92093.

- a. Official application for admission and awards.
- b. One set of official transcripts (sent directly to UCSD).
- c. Official scores on the Graduate Record Examination (GRE) for the verbal and quantitative aptitude. GRE scores *are required* by TEP. Applications may be obtained from the Educational Testing Service, Box 955, Princeton, NJ 08540.

- d. Nonrefundable \$40 application fee.
- 2. Submit to the Teacher Education Program (Q-070), University of California, San Diego, La Jolla, CA 92093.
 - a. A transcript showing an earned B.A. or B.S. from an accredited institution with a minimum 3.0 upper-division GPA.
 - b. At least three letters of recommendation.
 - c. Duplicate copy of GRE scores sent directly to TEP.
 - d. Evidence of current teaching or educational assignment for the duration of the graduate program.
 - e. Verification of possession of a current California teaching credential.
 - f. Demonstrated fluency in a foreign language or a computer language.

RESIDENCE REQUIREMENT

Students must be enrolled in twelve units a quarter for a minimum of three quarters or two full-time summer sessions during the course of study.

THE CURRICULUM DESIGN RESEARCH OPTION

The M.A. curriculum design research option is designed to assist professional educators in elementary and secondary schools incorporate educational research into the systematic design of classroom curriculum. Participants in the curriculum design option are offered an extensive overview of educational research and curriculum design principles with which they will design, implement, and evaluate a curriculum project in their own classrooms. UCSD credential graduates may count sixteen units of the credential program toward the M.A. requirements. Other experienced educators are encouraged to apply but must transfer or complete sixteen quarter-units of appropriate course work in addition to the required twenty-four units of graduate credit. Students are accepted into the graduate program in the summer and attend half-time in fall, winter, and spring quarters.

Program of Study

The curriculum design course of study includes sixteen upper-division units which already exist as part of the current UCSD credential programs and a minimum of twenty-four graduate units. The graduate courses are: TEP 230 A,B,C: Research on Curriculum Design (four units each); TEP 231: Advanced Instructional Practices (four units); TEP 290: Research Practicum (one to twelve units); and TEP 295: M.A. Thesis (Curriculum Design Portfolio) (one to

eight units), and other courses as approved by the program coordinator.

Table 1 shows a typical schedule for students in the M.A. teaching and learning: curriculum design option. Students who completed their postbaccalaureate credential course work at UCSD can apply sixteen units of approved credential courses towards the M.A. Students from other UC campuses, upon approval, can transfer up to eighteen postbaccalaureate upper-division or graduate units of approved course work, and non-UC transfer students up to eight postbaccalaureate upper-division or graduate units, in partial fulfillment of M.A. requirements.

TABLE 1
M.A. in Teaching and Learning (Curriculum Design): Typical Student's Schedule

UPPER-DIVISION			
Sixteen units from credential program			
SUMMER	FALL	WINTER	SPRING
TEP 290 TEP 231	TEP 230A	TEP 230B	TEP 230C
SUMMER			
TEP 290 TEP 295			

The students pursuing this M.A. option will generally be recent credential graduates of TEP in their first or second year of teaching. Table 2 lists current elementary and secondary credential courses which would apply to the M.A.

TABLE 2
M.A. in Teaching and Learning (Curriculum Design): Credential Completion and Graduate Courses

ELEMENTARY	
TEP 191: Innovative Inst.	(8)
TEP 193: Multicultural Ed.	(4)
TEP 162: Computer Applications	(4)
<i>Total Upper-Division Credential Units: 16</i>	
TEP 230A-B-C: Res. Curr. Design	(12)
TEP 231: Adv. Inst. Prac.	(4)
TEP 232: Adv. Topics in Ed.	(4)
TEP 290: Research Practicum	(1-12)
TEP 295: Thesis (Cur. Portfolio)	(1-8)
<i>Total Graduate Units: 24</i>	
Total M.A. Program Units: 40	
SECONDARY	
TEP 174 or 175: Math/Sci. Teaching Prac.	(4)
TEP 193: Multicultural Ed.	(4)
TEP 162: Computer Applications	(4)
TEP 176: Writing, Reading & Lang. Inst.	(4)
<i>Total Upper-Division Credential Units: 16</i>	
TEP 230A-B-C: Res. Curr. Design	(12)
TEP 231: Adv. Inst. Prac.	(4)
TEP 232: Adv. Topics in Ed.	(4)

TEP 290: Research Practicum (1-12)
TEP 295: Thesis (Cur. Portfolio) (1-8)
Total Graduate Units: 24
Total M.A. Program Units: 40

Note: M.A. candidates who have not completed the TEP credential program can transfer up to eighteen approved post-baccalaureate units (UC courses) or eight units (other universities). These must be equivalent to the UCSD upper-division credential courses listed above.

THE EDUCATIONAL RESEARCH OPTION

The M.A. educational research option is designed to assist professional educators in elementary and secondary schools to adopt a research perspective toward teaching. They will be provided basic preparation in appropriate research methods and will design and implement a research project on some aspect of the teaching-learning process with specializations in bilingual/multicultural education, interactive technology, and the writing process.

Program of Study

Courses in the educational research M.A. option are arranged in three strands: (1) Theories of Teaching and Learning (twelve quarter-units), (2) Research Methods (twelve quarter-units), (3) Instructional Practices (twelve quarter-units).

Theory Sequence. Twelve units, eight from among the following: Lit/Writing 142: Forms of Written Discourse (4); Lit/Writing 144: The Teaching of Writing (4); Psychology 216: Basic Seminar in Comparative Cognitive Research (4); Psychology 259A-B-C: Advanced Seminar in Comparative Cognitive Research (3-3-3); Sociology 271: Seminar in Classroom Interaction (4); Sociology 241: Cognitive and Linguistic Aspects of Social Structure (4); Sociology 242: Advanced Topics in Cognitive and Linguistic Aspects of Social Structure (4-4). Four units from among the following or other courses approved by the program coordinator: Lit/Writing 271: Theory and Practice of College Writing Instruction (4); Psychology 173: Literacy, Social Organization, and the Individual (4); Psychology 211: Piagetian Theory (3).

Research Methods Sequence. Eight units from among the following: TEP 220: Research Design for Educational Inquiry (6); TEP 295: M.A. Thesis (1-8). Four units from among the following or other courses approved by the program coordinator: Lit/Writing 272: Research on Composition and Written Discourse (4); Lit/Writing 273: Practicum on Research in Composing and Written Discourse (4); Psychology 216: Basic Seminar in Comparative Cognitive Research (4); TEP 290: Research Practicum (1-12); TEP

297: Directed Group Study (1-6); TEP 298: Independent Study (1-6).

Instructional Methods Sequence. Twelve units from among the following or other courses approved by the program coordinator: Lit/Writing 141: The Process of Writing (4); Lit/Writing 142: Forms of Written Discourse (4); Lit/Writing 144: The Teaching of Writing (4); TEP 162: Computer Applications in Teaching and Learning (4); TEP 176: Writing, Reading and Language Instruction (4); TEP 177: Health Education; TEP 178: Mainstreaming Special-Needs Students; TEP 179: Adolescent Development and Cultural Diversity; TEP 182A-B-C: Practicum in Interactive Computing (4-4-4); TEP 189: Curriculum Design for Bilingual Instruction (4); TEP 192: Bilingual Instructional Practices (4); TEP 230 A,B,C: Curriculum Design (66-6-6); TEP 231: Instructional Practices (4).

TABLE 3
M.A. in Teaching and Learning (Education Research): Typical Student's Schedule

THEORY			
FALL	WINTER	SPRING	
	Soc. 271	Psy. 259A	
RESEARCH METHODS			
FALL	WINTER	SPRING	SUMMER
TEP 220	TEP 290	TEP 297	TEP 295
INSTRUCTIONAL METHODS			
FALL	WINTER	SPRING	
TEP 162	TEP 230B	TEP 230C	

Courses

The following courses are offered by the TEP faculty. Students are advised to consult with the TEP credential coordinator to determine which courses are required for the credential programs and how to fulfill the elementary and secondary waiver program requirements. Undergraduate students may enroll in graduate seminars with the consent of instructor.

UPPER DIVISION

Sociology 117. Language, Culture, and Education (4)
The mutual influence of language, culture, and education will be explored; explanations of students' school success and failure 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) H. Mehan

Sociology 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. (S) H. Mehan

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. (F,W,S) R. Souviney

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) S. Bosworth 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. (F,W,S) D. Stermon and S. Bosworth

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. (W) C. Colaruso

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) F. Slowiczek

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. Janis

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-

SPECIALIZATIONS

The special expertise of the TEP M.A. course group enables students to specialize in three areas of concentration: bilingual education, interactive technology, and the writing process. Students choosing to specialize in these areas should take the following courses:

Bilingual Specialization:

1. Three courses in teaching and learning theory
2. Three courses in research methods
3. TEP 189, TEP 230, and Lit/Sp 261, or other courses approved by the program coordinator

Interactive Technology:

1. Three courses in teaching and learning theory
2. Three courses in research methods
3. TEP 162, TEP 182A-B-C, or other courses approved by the program coordinator

The Writing Process:

1. Three courses in teaching and learning theory
2. Three courses in research methods
3. Lit/Writing 141, 142, 144, or other courses approved by the program coordinator

COURSE OF STUDY SCHEDULE

Table 3 shows a typical student's course schedule for the educational research option:

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) Staff

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.* (S) C. Lawrence-Wallace, G. Fimbres, 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.* (F,Summer) C. Lawrence-Wallace, G. Fimbres, 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, C. Lawrence-Wallace, G. Fimbres, J. Janis, and K. Cooley

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) G. Fimbres

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) C. Lawrence-Wallace, G. Fimbres, J. Janis, and K. Cooley

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: TEP 191A or*

consent of instructor. (W) C. Lawrence-Wallace, G. Fimbres, 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, G. Fimbres, 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, G. Fimbres, J. Janis, and K. Cooley

TEP 192. 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.* G. Fimbres

TEP 193. Multicultural Education (4)

This course provides an historical overview of cultural and ethnic diversity in American society; identification of forces which contributed to the schools' recognition of that diversity; a study of theories and conceptual approaches which influence the development of multicultural education programs and activities; an examination of curriculum programs and teaching strategies which reflect various conceptualizations of multicultural education. *Prerequisite: confirmed TEP candidate or consent of instructor.* (F) C. Lawrence-Wallace

TEP 195. Apprentice Teaching (4)

Advanced TEP students are prepared in effective methods of supervising the preparation of UCSD students serving as paraprofessionals in elementary school classrooms. Topics covered include: classroom management, interpersonal relations, supervision techniques, multicultural education, politics in the school, and curriculum development. Each student serves as a discussion leader, and conducts at least two workshops. *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.* L. Corona

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 contribute 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.*

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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) Staff

TEP 231. Advanced Instructional Practices (4)

Selected advanced topics in K-12 instructional practices in various subject areas. Techniques for teaching higher-level cognitive 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,F,W,S) 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.) Staff

TEP 295. M.A. Thesis (4)

The student will work on the M.A. thesis under the direction of the students' thesis committee chairperson. *Prerequisites:* M.A. candidate and consent of committee chairperson. (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

Mary Corrigan, M.A.
Luther James
Walton Jones, M.F.A.
Steven Pearson, M.F.A.
Jonathan Saville, Ph.D.

Assistant Professors

James Carmody, Ph.D.
Tony Curiel, M.A.
Allan Havis, M.F.A.
Chris Parry
James Winker, M.F.A.

Lecturers

Steven Adler, M.F.A.
Ron Ranson, M.F.A.
Linda Vickerman, D.M.A.

Adjunct Faculty

John Arnone
Des McAnuff

THE UNDERGRADUATE PROGRAM

The curriculum in the Department of Theatre is based on the belief that a good undergraduate liberal arts theatre education should consist of a solid background in theatre history and dramatic literature, exposure to all of the artistic components of this discipline (acting, directing, design, and playwriting), and some practical experience in the production process. In addition to providing an integrated program for students desiring a theatre major, the curriculum provides (1) a sequence of courses to fulfill fine arts and/or humanities requirements for Muir and Third Colleges; (2) courses fulfilling Warren College program of concentration requirements; (3) courses to fulfill Revelle 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. In addition there is the flexibility necessary to allow a student to concentrate on one or more areas of the discipline in preparation for graduate study or work in the theatre. The major also attempts to prepare students for lives outside of theatre through courses which focus on concepts and ideas in a wider context. The required lower-division courses prepare the student for the various upper-division specialties which the student selects in consultation with a theatre faculty adviser. All required courses must be taken for a letter grade. The requirements for the major are:

Theatre 11. Introduction to Theatre
Theatre 30. Introduction to Acting
Theatre 42. Drama Survey: Tragedy
Theatre 43. Drama Survey: Comedy
Theatre 44. Drama Survey: Modern
Theatre 50. Improvisational Playwriting
Theatre 70. Theatre Production: Scenery and Lighting
Theatre 71. Theatre Production: Costumes
Theatre 130. History and Art of Directing

Two courses chosen from:

Theatre 120A. Intermediate Acting
Theatre 131. Directing Process
Theatre 140. Scene Design
Theatre 141. Lighting Design
Theatre 142. Costume Design
Theatre 153A. Beginning Playwriting

Five courses* chosen from:

Theatre 160. Topics from Early Theatre through the Renaissance
Theatre 161. Scandal, Desire, and Classical Comedy
Theatre 162. Romantic Theatre
Theatre 163. Realistic Theatre
Theatre 164. The History of the Avant-Garde
Theatre 165. Modern Black Drama
Theatre 166. Chicano Dramatic Literature
Theatre 167. Experimental Theatre
Theatre 168. Contemporary Dramatic Literature
Theatre 169. Topics in Dramatic Literature and Theatre History: _____

Theatre 170. Masters of Theatre _____

Theatre 176. American Musical Theatre
Theatre 178. Hispanic-American Dramatic Literature

*Two of these must be chosen from Theatre 160, 161, 162, 163, or 164.

Two courses chosen from:

Theatre 144 or 145. Visual Ideas I or II
Theatre 147A or 147B. History of Costume
Theatre 175. Theory of Theatre

Additional requirements:

Theatre 100. Theatre Studio. Must be taken a minimum of two times.
Theatre 189. Majors Seminar. Must be taken a minimum of four times.

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. Undergraduates may choose one of the seven theatre minors outlined below:

1. Dramatic Literature and History: Theatre 11 (recommended), 42, 43, 44 plus three upper-division courses in dramatic literature or history.



THEATRE

OFFICE: 2550 Galbraith Hall, Revelle College

Professors

Anne Bogart, M.A.
Eric Christmas, Emeritus
Frantisek Deak, Ph.D.
Deborah Dryden, M.F.A.
Floyd Gaffney, Ph.D.
Jorge Huerta, Ph.D.
Robert Israel, M.F.A.
Adele Shank, M.F.A., Chairperson
Theodore Shank, Ph.D.
Arthur Wagner, Ph.D.

Associate Professors

Andrei Both, M.F.A.

2. Theatre Technology and Design: Theatre 11 or 13, 70, 71, plus three upper-division courses in production and/or design. One course from Theatre 102-106 may be counted as one of the three upper-division courses.

3. General Theatre Minor: Theatre 10 or 11, 12, 13 plus three upper-division theatre 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 department undergraduate advisers. One course from Theatre 102-106 may be counted as one of the three upper-division courses by special petition.

4. Performance Minor: Lower-division requirements are Theatre 11, 30, and 35. Students must choose three upper-division courses in acting from the following list: Theatre 120A-B, 121A-B, 122, 124, 180, 187A-B. One course from Theatre 102-106 may be counted as one of the three upper-division courses by special petition and in consultation with the proposed instructor. NOTE: Students may enroll in certain upper-division acting classes by audition only. If students who choose the performance minor do not gain admission to these upper-division courses, they may be directed to change to the general minor listed above and will need to check with the undergraduate adviser to do so.

5. Ethnic Theatre Minor: Theatre 11, 40, 41 plus three upper-division courses from Theatre 125, 165, 166, 187A-B (Black Theatre Ensemble and/or Chicano Theatre Ensemble).

6. Playwriting Minor: Theatre 11 (recommended), 42, 43, 44, 153A, 153B, and 154.

7. Revelle College Noncontiguous Minor: (Revelle students only) Revelle College undergraduates may choose from the six minors listed above, or they may design a noncontiguous minor as follows: six theatre courses, three of which must be upper-division. **Students must have their selection of courses approved by the theatre faculty adviser prior to the junior year.**

NOTE: Theatre 100, 101, 197, 198, 199 may not be used in the theatre minors as upper-division electives.

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. Students at UCSD must be curious about their art. The essential questions they ask are

only as good as their knowledge of the art form, including its conventions.

The curriculum for all students involves studio classes and seminars. These are integrated with a progressive sequence of work on productions and with a professional residency at the La Jolla Playhouse.

The M.F.A. program at UCSD is built around the master-apprentice system of training. All the faculty are active professionals who teach at UCSD because of a shared commitment to training young artists. Instruction takes place not just in the classroom, but in theatres around the country where faculty, with students as assistants, are involved in professional productions, including those at the La Jolla Playhouse.

Students graduating from the M.F.A. program at UCSD should be prepared to take positions in the professional theatre in the United States and abroad. Students are now working in New York, in resident theatres, in the film and television industry, and in European repertory theatres. M.F.A. candidates in acting, design, directing, dramaturgy/criticism, playwriting, and stage management will complete at least ninety quarter-units of academic work during their tenure in the program.

Courses

NOTE: For changes in major requirements and in course offerings implemented after publication, inquire at the office of the Department of Theatre.

LOWER DIVISION

10. Theatre and Film (4)

Theatre and Film analyzes the essential difference between theatrical and cinematic approaches to drama. Through six 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 response.

11. Introduction to the Theatre (4)

A broad exposure to the experience of theatre. The course involves active participation in and discussion of the multiple elements of living theatre—including examination of the creative contribution of the playwright, the designer, the director, the actor, and the critic.

12. Introduction to Performance (4)

An introduction and investigation of various performance forms; beginning with storytelling/ritual and progressing to contemporary plays. Areas explored include poetry/song/imagination and improvisation/impromptu speech/performance art/monologues. Students will explore each of these areas, following the topic lecture, in structured exercises during the section. Students are required to attend all Department of Theatre plays for that quarter.

13. 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. A course serving nonmajors as an introduction to theatre design and production.

14. Introduction to World Theatre (4)

An exploration of dramatic forms and traditions of theatrical performance from a range of cultures, such as African, Asian, Indian, and Hispanic. The course also studies the influence of these diverse traditions on the development of the dramatic arts in our own culture during the present century. Topics may include: ritual and theatre; theatre and society; script and improvisation; concepts of acting and the actor; gesture; costume and the actor's body; visual coding of the scenic space.

20. 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 production, the craft of the actor, and how these come together to produce the art of cinematic performance.

25S. 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.

30. Introduction to Acting (4)

Course designed to equip the actor with the basic tools necessary for further stage work. Lectures, exercises, and scene study. This course is prerequisite to Theatre 120A-B, Intermediate Acting. Priority will be given to declared theatre majors and theatre performance minors. Theatre 12 is recommended as preparation for Theatre 30.

35. Speech for the Actor (4)

Course is taught with stage performance of spoken English in mind. In particular, the goal of the course is to eliminate from the students' speech all distortions and manners of speech. Dialect preferences and sub-standard inaccuracies are identified in the speech of the students as the entire English phoneme is taught, reviewed, and applied to the students' speech.

40. 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.

41. Introduction to Black Drama (4)

This course is 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.

42. Drama Survey: Tragedy (4)

A close examination of plays that reveal man as overreacher, as dreamer, as self-destroyer, and as both victim and victor in the conflict with his cosmos. *Prerequisite: sophomore standing.*

43. Drama Survey: Comedy (4)

Comic theatre as a revelation of man's refusal to endure fools and charlatans, and as a celebration of the vital forces of life. *Prerequisite: sophomore standing.*

44. Drama Survey: Modern (4)

A close examination of the texts 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 expressionism to epic theatre. All of the plays dealt with will be viewed in terms of their

realization in the theatre so that their full value as texts is understood. *Prerequisite: sophomore standing.*

50. Improvisational Playwriting (4)

Free-form approach to building dramatic scenes with emphasis on immediate group-writing in class. The long-range goal is to shape various exercises into a unified one-act play. Beginning and more experienced writers can benefit from this introduction to playwriting. Exercises comprise both written and acting efforts.

70. Theatre Production: Scenery and Lighting (4)

One part of a two-part survey of technical theatre production. This course aims to give students an introduction to the techniques of scenery and lighting for the theatre. The course also examines these areas in the context of current UCSD theatre productions. *Prerequisite: Theatre 70 is a prerequisite for Theatre 140 and 141.*

71. Theatre Production: Costumes (4)

One part of a two-part survey of technical production. This course focuses on the use of costume and makeup in theatre production, studied primarily in the context of UCSD theatre productions. *Prerequisite: Theatre 71 is a prerequisite for upper-division courses in costume design.*

90. Undergraduate Seminar (1)

Discussion of various theatre topics.

NOTE: Theatre 11, 12, and 13 or Theatre 42, 43, and 44 will fulfill general-education requirements as follows: Muir College: fine arts requirement; Third College: humanities or fine arts requirement; Revelle: any theatre course will fulfill fine arts requirement. Fifth College: Two Western or non-Western culture courses. (Can be met through music, theatre, or visual arts.)

UPPER DIVISION

100. Theatre Studio (2)

Development of an understanding of central elements of theatre production—including scenery, lighting, sound, costume and properties—through participation in the creation of UCSD Theatre presentations. Theatre majors are required to enroll in Theatre 100 a minimum of two times; a maximum of twelve units of Theatre 100, 101, 102, 103, and 104 may be used for graduation. Students must attend first class meeting to enroll in the course. *Prerequisite: consent of instructor.*

101. Studies in Performance (0-4)

A course designed for the in-depth study of a particular play, its playwright, his or her times and milieu, culminating in a fully mounted presentation. Audition required. A combined total of twelve units of Theatre 100, 101, 102, 103, and 104 may count toward graduation. *Prerequisite: consent of instructor.*

102. Studies in Technical Theatre (2 or 4)

A laboratory class in which students participate in the construction and operation of scenery for UCSD Theatre productions. During this class each student will be assigned scenic projects to follow through from start to finish. Each student will receive step by step guidance and direction in the assigned project for the production and will actively participate in the total process that transforms a designer's drawings into completed scenery. A maximum of twelve units of Theatre 100, 101, 102, 103, and 104 may count toward graduation. *Prerequisite: consent of instructor.*

103. Studies in Costume Construction (2 or 4)

A laboratory class in which students participate in the construction of costumes for UCSD Theatre productions. During the course each student will be assigned a single costume or costumes to construct from start to finish. Each student will receive step by step guidance and direction on costume construction techniques and will actively participate in the total process that transforms a designer's sketch into a completed costume. A maximum of twelve units of Theatre 100, 101, 102,

103, and 104 may count toward graduation. *Prerequisite: consent of instructor.*

104. Studies in Lighting and Sound (2 or 4)

Theatre 104 is a laboratory course in which students participate in the preparation and operation of lighting and sound equipment for UCSD Theatre productions. During this class, each student will be assigned lighting or sound projects to follow through from start to finish. Each student will receive step by step guidance and direction in lighting and sound methods used in theatre production and will actively participate in the total process that transforms a designer's drawings into stage lighting or sound. A maximum of twelve units of Theatre 100, 101, 102, 103 and 104 may count toward graduation. *Prerequisite: consent of instructor.*

105. Studies in Stage Management (4)

A production/performance-oriented course exercising the fundamental techniques of stage management. Laboratory format culminating in fully mounted theatrical production. Interview required for admission. *Prerequisite: consent of instructor.*

106. Studies in Dramaturgy (4)

The study of the dramatic text prior to production, including analysis of the text and historical research when applicable. Subsequently, the student will study the process of transformation of literary text into the theatrical production through participation in Department of Theatre productions from rehearsals to the completion of the work. *Prerequisite: Theatre 42, 43, 44 recommended.*

109. Apprenticeship/La Jolla Playhouse (4)

The La Jolla Playhouse Summer Apprenticeship is for conservatory students who want professional production experience along with the conservatory's performance training. In addition to conservatory class work, apprentices are assigned to a Playhouse production for the entire rehearsal and performance process, getting to know actors, directors, and stage managers and establishing a positive network of professional contacts. Apprentice assignments range from seven to eleven weeks, May-August, depending on availability. *Prerequisites: audition/interview, upper-division standing, resume, and three letters of recommendation.*

110. Conservatory/La Jolla Playhouse (12)

The La Jolla Playhouse Summer Conservatory provides concentrated studies in performance, acting, scene study, text analysis, voice, speech, and movement in a professional theatre environment. Classes are taught by artists and staff from the La Jolla Playhouse and UCSD Department of Theatre faculty. Classes in the eight-week program meet Tuesday through Friday from 9:00 a.m. to 5:00 p.m. The conservatory concludes with a final workshop presentation for family, friends, and Playhouse artistic staff. *Prerequisite: audition/interview, upper-division standing, or consent of faculty.*

115-S. 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 Theatre Games or a beginning acting course. Offered in Summer Session only.

120A-B. Intermediate Acting (4-4)

The process of acting, its theory and practice, examined through exercises, text analysis, and the preparation of scenes from the modern repertoire. *Prerequisite: Theatre 30 or consent of instructor.* Priority will be given to declared theatre majors and theatre performance minors.

121A-B. Advanced Acting (4-4)

Further studies in the process of acting, theory and practice, through concentrated work in classical texts. *Prerequisites: Theatre 120A-B and consent of instructor.*

122. 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 television. Explorations in staging on the movie set involving differing camera angles. Students will rehearse and perform in simulated studio settings. *Prerequisites: Theatre 30, 120A-B, and/or consent of instructor.*

123. The Art of Movement: An Introduction (4)

Fundamentals of the art of movement as a basis for theatre, dance, the performing and visual arts, and as a research methodology for the analysis of movement. *Prerequisite: consent of instructor.*

124. Freeing the Voice (4)

Intensive workshop for actors and directors designed to "free the voice," with special emphasis on characterization and vocal flexibility in a wide range of dramatic texts. This proven method combines experimental and didactic learning with selected exercises, texts, tapes, films, and total time commitment. *Prerequisite: Theatre 30 or consent of instructor.*

125. Dances of the World (4)

Course designed for in-depth study of the dance of a particular culture—Afro-Cuban, Bharata-Natyam, Balinese, Korean, etc. Specific topic will vary from quarter to quarter. May be repeated one time for credit.

130. History and Art of Directing (4)

An examination of the director's artistic and interpretive responsibilities and of the creative process that leads to that development of the theatre event. The course will lay emphasis on the historical evolution of the director as central artist in the theatre, as a means toward understanding the various artistic bases from which directors have moved in their work. Additionally, there will be a heavy concentration on the research, analysis, and textual preparation that is an essential part of directing for the theatre. *Prerequisite: Theatre 11, 12 or 30, or consent of instructor.*

131. Directing Process (4)

An intermediate course on directing practice using information-getting exercises and games. Culminates in the guided rehearsal process of a scene or scenes from a play chosen by the instructor. *Prerequisites: Theatre 130 or consent of instructor.*

132. Advanced Directing (4)

A studio course for advanced students. This study will focus on the development of the director's most complex task: the creation (with actors) of a physical realization of text. The course will use carefully 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 MAY BE REQUIRED FOR ADMISSION TO COURSE. *Prerequisites: Theatre 70, 71, 130, and 131 required or consent of instructor.*

135. 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. *Prerequisites: Theatre 11, 12, and 13 recommended.*

140. Scene Design (4)

Projects in scene design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes drafting, model building, and rendering in various media for specific plays. *Prerequisite: Theatre 70 or consent of instructor.*

141. Lighting Design (4)

This course aims to develop the student's visual imagination in the context of lighting design and composition through a series of studio/lab projects. These emphasize research, conceptual-

ization, visual expression, and collaboration. Studio work involves manipulating light and color, and drafting basic lighting plots. *Prerequisites: Theatre 70 and consent of instructor. Theatre 104 is recommended.*

142. Costume Design (4)

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays. *Prerequisite: Theatre 71 or consent of instructor. Theatre 144, 145 recommended.*

144. Visual Ideas I (4)

History of visual expression of Renaissance, baroque, rococo, French Revolution, realism, focusing on the visual arts of the theatre as they reflect and use significant artistic movements. An integrated study through reading, research, and lecture of traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite: upper-division standing. Theatre 161, 162, and 163 recommended.*

145. Visual Ideas II (4)

History of visual expression on realism to the present, focusing on the visual arts of the theatre as they reflect and use significant artistic movements. An integrated study through reading, research, and lecture of the traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite: upper-division standing. Theatre 163 recommended.*

147A-B. History of Costume (4-4)

A survey history tracing the evolution of clothing and its social context from preliterate cultures through the twentieth century. A and B offered in alternate years. *Prerequisite: Theatre 144, 145, or consent of instructor.*

148. Drafting for the Theatre (4)

Studies in technical drawing for the theatre designer and technician. Through instruction and laboratory exercises, the student designer should attain a basic understanding of technical drawing and graphic skills so that he or she will be able to communicate design ideas to scenic and lighting workshops. *Prerequisite: Theatre 70 or consent of instructor.*

149. 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. Topics will vary from quarter to quarter. May be repeated three times for credit. *Prerequisite: Theatre 70, 71 or consent of instructor.*

153A. Beginning Playwriting (4)

A project-oriented exploration of writing for the theatre, focusing on finding effective form for dramatic action, developing character, and writing dialogue. Students will have various writing exercises and will write one or more short plays. Classes will be largely symposium sessions where students will engage in shared evaluation of scripts generated by writers in the class. *Prerequisites: Lit/Writing 8AB or Theatre 42, 43, 44, or consent of instructor, and upper-division standing.*

153B. Intermediate Playwriting Workshop (4)

Detailed attention will be given to character development and techniques for writing dialogue. Students will write a one-act play during the term which will be discussed at each step in its development in symposium sessions. *Prerequisite: Theatre 153A and/or consent of instructor.*

154. Advanced Undergraduate Playwriting (4)

Projects will be decided upon on an individual basis. The class will meet in seminar to discuss each step in the development of the plays being written. May be repeated for credit. *Prerequisites: Theatre 153A and 153B or consent of instructor.*

158. Experimental Theatre Workshop (4)

The Experimental Theatre Workshop is for those students who are interested in acting or in playwriting. The workshop will deal with some of the fundamental aspects of theatre; transformation, dialogue, character from a point of view common to both actors and playwrights. The acting student can see this workshop as a way of learning to understand the literary text through developing and performing his or her own text. The playwriting student can see the workshop as a way of learning to develop dramatic text through the acting process. Class will culminate in performances. *Prerequisite: consent of instructor.*

160. Topics from Early Theatre through the Renaissance (4)

A study of theatrical production and dramatic texts from ancient Greece and Rome, the Middle Ages, and the Renaissance. Topics vary. May be taken three times for credit. *Prerequisites: Theatre 42, 43, 44, and upper-division standing or consent of instructor.*

161. Scandal, Desire, and Classical Comedy (4)

From the reopening of the theatres in Restoration London to the *Marriage of Figaro*, which ushered in the French Revolution. This course traces the development of the comedy of manners and romantic comedy in England and France in the seventeenth and eighteenth centuries. A select group of texts will be studied in the contexts of the national and dramatic cultures in which they were first produced as well as from the perspective of their continued popularity in our contemporary theatre. *Prerequisites: Theatre 42, 43, 44, and upper-division standing or consent of instructor.*

162. Romantic Theatre (4)

This conceptual study will examine both the influence of nineteenth-century romanticism on contemporary theatre and romanticism as one of the fundamental attitudes toward art and life present throughout history. Emphasis will be placed on the relationship between contemporary assumptions about theatre and their original formulations in the context of the romantic theatre, and on how the romantic premises and attitudes found their expression in elements of theatrical structure—acting, directing, design, dramatic text—and in the audience's experience and response. *Prerequisites: Theatre 42, 43, 44, and upper-division standing or consent of instructor.*

163. Realistic Theatre (4)

This conceptual study will examine both 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 will be placed on the relationship between contemporary assumptions about theatre and their original formulations in the context of the realistic theatre, and on how the realistic premises and attitudes found their expression in elements of theatrical structure—acting, directing, design, dramatic text—and in the audience's experience and response. *Prerequisites: Theatre 42, 43, 44, and upper-division standing or consent of instructor.*

164. The History of Avant-Garde Theatre (4)

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 which were the most representative and influential on the culture of the twentieth century. *Prerequisites: Theatre 42, 43, 44, and upper-division standing or consent of instructor.*

165. Modern Black Drama (4)

From Lorraine Hansberry's *Raisin in the Sun* to the latest plays of Ed Bullins, black drama has mirrored and, in some instances, forecast the mood and aspirations of black people in America. The course examines the plays, playwrights, and participants in contemporary black theatre, its concerns and influences. *Prerequisites: Theatre 42, 43, 44 strongly recommended.*

166. Chicano Dramatic Literature (4)

(Same as Chicano Studies 142.) Focusing on the contemporary evolution of Chicano dramatic literature, this course will analyze the playwrights and theatre groups that express the Chicano experience in the United States. Relevant "actos," plays, and documentaries will be examined for their contributions to the developing Chicano theatre movement. *Prerequisites: upper-division standing; Theatre 40, 42, 43, 44 strongly recommended or consent of instructor.*

167. Experimental Theatre (4)

Course dealing with the forms of contemporary theatre and principal figures in the contemporary theatre world—playwrights, directors, designers, performers. *Prerequisites: upper-division standing and Theatre 42, 43, 44 or consent of instructor.*

168. Contemporary Dramatic Literature (4)

Survey on American and British works from 1950s to the present. Playwrights to be read include writers such as Pinter, Hare, Churchill, Brenton, Osborne, Albee, Guare, Shepard, Durrang, Mamet, and Fornes. Course may include assigned visit to local theatre production. *Prerequisites: upper-division standing and Theatre 42, 43, 44 or consent of instructor.*

169. Topics in Dramatic Literature and Theatre History: _____ (4)

A lecture course offering the upper-division and/or graduate student 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. *Prerequisites: upper-division standing and Theatre 42, 43, 44 or consent of instructor.*

170. Masters of Theatre: _____ (4)

This seminar study will focus on an artist of seminal importance to the development of the theatre. Intensive consideration will be given to theory and practice of the artist under consideration, with emphasis on theatrical realizations that can be reconstructed by integrated research, including biography, major theoretical texts, production records, correspondence, and critical studies. Examples of recent courses include Moliere, Athol Fugard, and Strindberg. Topic will vary quarter to quarter. May be repeated two times for credit. *Prerequisites: upper-division standing, Theatre 42, 43, 44 required or consent of instructor.*

171. Music Drama (4)

(Same as Music 122.) 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. *Prerequisite: upper-division standing.*

172. Great Films of Great Plays (4)

Examination of selected major 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.

173. 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. May be repeated two times for credit. *Prerequisite: upper-division standing. Offered in Summer Session only.*

174. Shakespeare on Stage (4)

A close look at the performance of Shakespeare's plays in the theatre from the point of view of actor and director. Exploration of historical elements that shaped the Bard's repertoire. Lectures and texts will be illustrated with scenes presented live and on film and will be critiqued. May be repeated one time for

credit. *Prerequisite: Theatre 42, 43, 44 recommended.* Offered in Summer Session only.

175. Theory of Theatre (4)

The basic objectives of the course are: (1) to survey the most important theories of theatre from Aristotle to present-day structuralism and to establish theoretical terminology; (2) to learn to analyze a theatre production; and (3) to learn to use theoretical material as a part of the creative process for actor, playwright, and director. *Prerequisites: upper-division standing and Theatre 42, 43, 44 required or consent of instructor.*

176. 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.

177. Understanding Life Phenomena through Sociological Concepts and through Drama (4)

(Same as Sociology 177.) This course will compare, contrast, and where possible, synthesize the way in which sociologists attempt to understand the complexities of behavior in human life through the use of concepts and systematic investigation with the way dramatists attempt to distill and portray these same emotion-wrought situations. Major sociological concepts will be discussed and portions of well-established plays will be presented by theatre majors which illustrate these concepts in action. Lectures on the playwright's goals and dramatic components of the play, as well as generic applications of the concept to other areas of human group life will be offered as a catalyst to class discussion. Students will be assigned related readings in both sociology and theatre. *Prerequisite: one lower-division sociology course or consent of instructor.*

178. Hispanic-American Dramatic Literature (4)

This course will examine 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. Students will be asked to read early examples of plays as well as contemporary works by authors such as Eduardo Machado, Jose Rivera, and Luis Valdez. *Prerequisites: Theatre 42, 43, 44, or consent of instructor as well as upper-division standing.*

180. Major Project in Acting (2 or 4)

Designed for the advanced performance student, this course will allow for intensive focus upon a particular challenging role, and for its development within the context of preparation, rehearsal, and performance. Additionally, the interaction of students within this course will allow for a sharpened understanding of the external adjuncts to the role, and of the other creative forces that must be assimilated. May be repeated one time for credit. *Prerequisites: Theatre 120A-B and consent of instructor. Admission by consent of instructor only. See department for special projects application.*

181. Major Project in Design/Theatre Production (2 or 4)

Designed for the advanced design/production student, this course will allow for 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. Additionally, the interaction of students within this course will allow for a sharpened understanding of the external adjuncts to the project, and of the other creative forces that must be assimilated. May be repeated one time for credit. *Prerequisite: admission by consent of instructor only. See department for special projects application.*

182. Major Project in Directing (2 or 4)

Designed for the advanced student in directing, this course will permit intensive concentration on the full realization of a dramatic text, from research and analysis through rehearsal and into performance. Additionally, the interaction of students

within this course will allow for a sharpened understanding of the external adjuncts to the role, and of the other creative forces that must be assimilated. May be repeated one time for credit. *Prerequisites: Theatre 130, 131, and 132 and consent of instructor. See department for special project application.*

187A. 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, commedia dell'arte theatre. Audition may be required. A maximum of twelve units may be used toward graduation.

187B. Ensemble: _____ (4)

An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon explorations of ensemble rehearsal process, the development of technical self-support systems, the extension of performance modes, and the performer/event/audience relationships. Ensemble segments include: black theatre, Chicano theatre, feminist theatre, commedia dell'arte theatre. Audition may be required. *Prerequisite: Theatre 187A. A maximum of twelve units may be used toward graduation.*

189. Major Seminar (1)

Required of all theatre majors. Designed to provide the student with an opportunity to explore a variety of topics relating to the dramatic arts to be presented by Department of Theatre faculty and distinguished lecturers.

195. Instructional Assistance (2 or 4)

Assist with instruction in undergraduate Department of Theatre courses. May be repeated for a total of eight units.

196. Senior Study in Theatre (2-8)

Designed for the senior theatre major who has shown exceptional ability, and for whom a special study of major scope and depth will provide a significant culminating experience. These studies will vary in subject according to student needs and interests, but will only be permitted for those whose proven creative gifts and level of preparation qualify them for work and achievement at the highest level. *Prerequisites: senior standing and consent of instructor.*

197. Field Studies (2-8)

Designed for advanced students, this course will enable them to significantly extend their knowledge of the theatre through intensive participation in the creative work of major professional theatre, under the guidance of artists resident in those theatres. In addition, students will be required to submit a regular written evaluation each week of their ongoing field study to their faculty adviser. *Prerequisites: consent of instructor and senior standing.*

198. Directed Group Studies in Theatre (0-2-4)

Group studies, readings, projects, and discussions in theatre history, problems of production and performance, and similarly appropriate topics. *Prerequisites: minimum, junior standing and consent of instructor.*

199. Special Projects in Theatre (0-2-4)

Qualified students will pursue special projects in reading drama, studying theatre history, or doing research for a production. *Prerequisites: minimum, junior standing and consent of instructor.*

details of the program and the course offerings at the time.

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. From Script to Performance (3)

A study of selected scripts and of productions of those scripts recorded on film or videotape. Through discussion, we will analyze the acting styles and techniques and interpretations of the scripts in the recorded productions. *Prerequisite: graduate standing.*

203. Text Analysis for the Actor (2)

A course designed to introduce the actor to the principles of text analysis, character analysis, and scoring, using the theories of transactional analysis as the principle tool. Lectures and discussions on the principles of Constantin Stanislavsky and Eric Berne, and presentation of sample text analysis by members of the class form the structure of the course. *Prerequisite: graduate standing.*

204A. Theatrical Modernism: Nineteenth to Twentieth Century (4)

Topics to be covered include: radicalism of realism; symbolist theatre and the origins of the avant-garde; the new director as an artist; new structures of representation; painters and the modern theatre; from modernism to postmodernism. *Prerequisite: graduate standing.*

204B. Contemporary Theories of Theatre (4)

An investigation of contemporary theories of theatre with an emphasis on structural and poststructural perspectives on text and textuality. The seminar will focus on adapting contemporary techniques of close reading to the interpretive and creative processes in the theatre. *Prerequisite: graduate standing.*

204C. 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.

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 Studio (2)

Studio designed to provide information and skills necessary to realize productions that are in rehearsal but not to be used as rehearsal period. *Prerequisite: graduate standing.*

GRADUATE

NOTE: The theatre graduate program is currently under review, and substantial changes may result. Students should consult with the departmental graduate adviser to determine the exact

208. Theatre Seminar (2)

An introduction to ideas and individuals in contemporary theatre for all first-quarter graduate students. *Prerequisite: graduate standing.*

210A-B-C. Acting Process I: Realism (3-3-3)

The actor's process is analyzed and experienced through a series of exercises designed to introduce the actor to the principles of "action" and "objective" followed by scene work from realistic texts employing an "actor's score" as a viable tool, culminating in intensive work on Chekhov. *Prerequisites: 210A for B; 210B for C.*

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.*

212A-B-C. Theatre Production I (1-4/1-4/1-4)

Ranging from staged readings of new plays, documentary drama, or synthetically created dramatic texts to totally integrated productions of full-length plays (faculty or student directed) and incorporating the creative contribution of actors, directors, playwrights, and critics, this intensive involvement in multiple forms of theatre will serve as the necessary creative laboratory for the M.F.A. program. (S/U grades only.) *Prerequisites: 212A for B; 212B for C.*

213A-B-C. Movement for Theatre I (2-2-2)

An intensive studio course in the art of movement as a basis for theatre performance. Theory and practice of energy flow, weight, spatial focus, time consumption, and the shape factor. (S/U grades only.) *Prerequisites: 213A for B, 213B for C.*

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.*

222A-B-C. Theatre Production II (1-4/1-4/1-4)

Ranging from staged readings of new plays, documentary drama or synthetically created dramatic texts to totally integrated productions of full-length plays (faculty or student directed) and incorporating the creative contribution of actors, directors, playwrights, and critics, this intensive involvement in multiple forms of theatre will serve as the necessary creative laboratory for the M.F.A. program. (S/U grades only.) *Prerequisite: 222A for B.*

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.

231. Survival Seminar (1-3)

An advanced seminar that focuses on the grimmer realities that bridge between the theatre artist and the theatre, including a study of unions, relations with agents and managers, contracts and taxation, auditioning, interviewing, and various methods of professional development. Particular attention will be given to generation of a broad understanding of the company to enter into participation in the professional theatre.

232A-B. Theatre Production III (1-4/1-4)

Ranging from staged readings of new plays, documentary drama, or synthetically created dramatic texts to totally integrated productions of full-length plays (faculty or student directed) and incorporating the creative contribution of actors, directors, playwrights, and critics, this intensive involvement in multiple forms of theatre will serve as the necessary creative

laboratory for the M.F.A. program. *Prerequisite: Theatre 232A for 232B.*

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.

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. Graduate Directing Seminar (0-4)

A seminar for all graduate directing students. Devoted to exploring the historical, theoretical, practical, and personal aspects of the craft and process of directing. Includes discussion, readings, occasional papers, and directing exercises. Will relate strongly to each term's directing projects.

250. Playwriting Seminar (4)

The specific topic will vary each quarter but may include (1) an investigation of the realistic dramatic genre and a review of fundamentals of playwriting; (2) an investigation of the variety of nonrealistic dramatic genres and a further study of more complex issues of dramatic composition. *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 (3)

Class will deal with series of tasks usually associated with the function of dramaturg in professional repertory company: preparation of text for production; cutting and rewriting of plays; problems of translation, etc. Class will also deal with the general issue of the function of dramaturg in the contemporary American theatre. *Prerequisite: graduate standing.*

253. Dramaturgy Practicum (3)

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 (4)

A series of detailed dramaturgic and scenographic examinations of influential reinterpretations of classic dramatic texts.

THEATRE

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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.

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.

270A-B-C. Design Studio I: _____ (4-4-4)

This course will focus on beginning-level problems in theatre design, including text analysis, research, conceptualization, and visual expression. Students will work on individual projects in lighting, costume, and scenic design. The course will include group critiques of completed designs and works in progress. 270A: Scenic Design; 270B: Costume Design; 270C: Lighting Design.
Prerequisite: graduate standing.

271. Advanced Design Studio III (1-6)

Ongoing work on individual projects for all graduate students in design with group critiques of completed designs and works in-progress. To be repeated each quarter of the graduate student's third-year residence.

272. Portfolio Studio (1-4)

This course evaluates current portfolio progress of graduate students in their third year of training. Creative projects in class designed to augment the individual student portfolios. Class culminates in final exhibition of student portfolio in combination with student's thesis production.
Prerequisite: graduate standing.

273. Theatre Production: Design (1-4)

Intensive involvement in UCSD theatre productions in the role of designer or design assistant, including collaboration with director from dramatic text to production. The course will serve as the creative laboratory for M.F.A. students specializing in theatre design.
Prerequisite: graduate standing.

274. Intermediate and Advanced Scene Design (4)

This course explores intermediate and advanced problems in scenic design through creative projects and works in progress.
Prerequisite: graduate standing.

275. Intermediate and Advanced Lighting Design (4)

This course explores intermediate and advanced problems in lighting design. Creative projects are focus of class work, with special emphasis on works in progress.
Prerequisite: graduate standing.

276. Intermediate-Advanced Costume Design (4)

Projects in costume design, emphasizing script analysis, research, conceptualization, and visual expression. Studio work includes costume rendering in various media for specific plays.

277. Fabric Painting and Dyeing for the Theatre (4)

Studies in the surface treatment of fabric for theatre costume, includes textile design techniques of batik, silkscreen, block-print, 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: _____ (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, 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.

282. Technical Production for Theatre Administrators (1-4)

A course for all theatre administration students 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.

283. Design Workshop: Costume, Lighting, Scenery (1-4)

For all first-year M.F.A. students in theatre administration. Course will vary from year to year, always focusing on the development of knowledge and awareness of design in the production process. Each term, the student will study one aspect of design, e.g., scenery, through class work or production projects.
Prerequisite: graduate standing.

284A. Nonprofit Theatre Structure (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 (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 (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 (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 (4)

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, tele-marketing, and budgeting.
Prerequisite: first- or second-year graduate standing.

296. Stage Management Practicum (4-12)

Taken in the final term by second-year stage management students. Course focusing on the development of knowledge and skills of contemporary examples of stage management.
Prerequisite: graduate standing.

297. Thesis Research (2-8)

Thesis research for M.F.A. degree. (S/U grades only.)

298. Special Projects (0-4)

Advanced seminar and research projects in theatre. (S/U grades only.)

299. Thesis Project (2-8)

Specific projects in theatre individually determined to meet the developing needs, interests, and abilities of M.F.A. candidates. (S/U grades only.)

500. Apprentice Teaching (2)

This course, designed to meet the needs of the graduate students who serve as teaching assistants, includes analysis of texts and materials, discussion of teaching techniques, conducting discussion sections, formulation of topics and questions for papers and examinations, and grading papers and examinations under the supervision of the instructor assigned to the course. Participation in the undergraduate teaching program is required for the M.F.A. degree. The amount of teaching required is equivalent to the duties expected of a 25 percent teaching assistant for one quarter. Enrollment for two units in this course documents the requirement.

501. Teaching in the Humanities (4)

Consideration of pedagogical applications to teaching of literary, historical, and philosophical texts at the undergraduate level. Pedagogical aids for the teaching of composition and supervised teaching in sections of the undergraduate humanities sequence.
Prerequisite: graduate standing.

THIRD COLLEGE

HONORS PROGRAM

OFFICE: Provost, Third College, Administration Building

The Third College Honors Program provides exceptional students at Third College the organization and the environment within which to pursue individual excellence. Participation in the Third College Honors Program entitles high achieving students upon entry to enroll in the Freshman Honors Seminar 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 by faculty or prominent persons on or off campus which focus on recent research or current events in all fields. The quarterly Provost's Chat provides a relaxed and friendly atmosphere to discuss items of interest to honors students directly with the provost of the college. Third College recognizes superior achievement each year with an Honors Recognition Dinner 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 classes in science and mathematics, and University Honors at graduation all add to the challenge of honors education at Third College and UCSD.

WRITING PROGRAM

OFFICE: Third College Humanities Building (TCHB), Third College

Charles R. Cooper, Ph.D., *Professor of Literature, Coordinator of the Program*

The Third College Writing Program (TCWP) offers Third College students a university course in writing and reading the major forms of nonfiction prose: autobiography, reportage, explanation, and argument. TCWP 1A and 1B are required of all Third College freshmen as part of the Third College general-education program. Some transfer students also take one or both courses. In TCWP, students practice a wide range of strategies for invention and inquiry, field research, and library research. They learn how to search out evidence supporting their arguments, to integrate it appropriately into their essays, and to docu-

ment their sources. They receive comprehensive instruction in writing academic reports and taking essay exams. TCWP emphasizes the connection between reading and writing. Consequently, students engage in rhetorical analysis of published texts, learning critical reading skills which they apply in writers' workshops to their own and other students' texts. Students write about 15,000 words (journals, invention, drafts, revisions) and read about 1,000 pages in each course. Classes are small, permitting students to participate in discussion and analysis of readings and in writers' workshops, where drafts to be revised are analyzed critically by the instructor and other students. All essays are revised at least once. At least three times each quarter, students meet their instructors in scheduled tutorials. Both courses must be taken for a letter grade.

Courses

1A-1B. The Writing Course (4-4)

A course in university reading and writing required of all Third College freshmen and of transfer students who have not completed a comparable course elsewhere. Course 1A focuses on explanation and argument (proposing solutions to problems, justifying evaluations, explaining causes, analyzing literature). Students study strategies of defining, illustrating, comparing, and classifying. They learn library search strategies as well as a style of documenting sources. Course 1B continues the study of argument and also concerns autobiography, biography, and reportage. Students study strategies of describing and narrating. Along the way to writing a long profile in the reportage sequence, students complete observational and interview writeups.

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.)*

THIRD WORLD STUDIES

OFFICE: Room 121, Third College Humanities Building, Third 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*

Sherley Anne Williams, M.A., *American and Afro-American Literature*

Associate Professors

Robert Cancel, Ph.D., *African and Caribbean Literature, Coordinator of Third World Studies*
 Michael P. Monteon, Ph.D., *Latin American History*
 Marta E. Sanchez, Ph.D., *Latin American and Chicano Literature*
 Rosaura Sanchez, Ph.D., *Spanish and Latin American Literature, Linguistics*
 William Tay, Ph.D., *Chinese Literature*
 Carlos Waisman, Ph.D., *Sociology*

Assistant Professors

Vicente L. Rafael, Ph.D., *Communication: Southeast Asian and Philippine Culture*
 Julie Saville, Ph.D., *Afro-American History*

Adjunct Professor

Leften S. Stavrianos, Ph.D., *History*

The Third World Studies Program has three main objectives:

1. To provide an understanding of the Third World and its relationships to the West. In order to understand these relationships, it is necessary to study the historical context out of which the present relationships developed. For example, besides trying to understand what kind of society existed in Meso-America when the Spaniards arrived in 1520, the student must also have an understanding of the historical development in Europe which resulted in Spain's decision to seek wider trade abroad. There is insistence on both the similarities and differences which Third World societies have among themselves and the similarities and differences with Western societies.
2. To provide an interdisciplinary approach to the study of the Third World. The program is not conceived as being exclusively historically oriented nor as being predominantly a social science program, but rather one that integrates both the social sciences and the humanities.
3. To provide an understanding of the 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 7A-B-C, TWS 21, 22, 23, or TWS 24, 25, 26). 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 problem or on a geo-historical area. The remaining four courses may overlap with the other major requirements. Students should consult a Third World studies faculty member or program adviser for approval of a major program.

MINOR

A student may minor in Third World studies by selecting a lower-division Third World studies sequence (three courses) and three upper-division courses in disciplines dealing with the Third World.

Third World studies faculty members offer courses in the Departments of Literature, Sociology, History, Philosophy, Theatre, and in the Third World Studies Program. Appropriate courses in political science, music, and anthropology will also be considered. Students should consult departmental and program listings for Third World area offerings.

Courses

See listings also under the Departments of Literature, History, Philosophy, and Sociology for other Third World area offerings.

LOWER DIVISION

7A. Race and Ethnicity in the United States (4)
(Same as HILD 7A.) A lecture-discussion course in 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.

7AW. Race and Ethnicity in the United States (6)
(Same as HILD 7AW.) A writing-intensive version of Third World Studies 7A that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States.

7B. Race and Ethnicity in the United States (4)
(Same as HILD 7B.) 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.

7BW. Race and Ethnicity in the United States (6)
(Same as HILD 7BW.) A writing-intensive version of Third World Studies 7B that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. The focus will be on Asian and European migration to the United States.

7C. Race and Ethnicity in the United States (4)
(Same as HILD 7C.) A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be Chicanos, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in America.

7CW. Race and Ethnicity in the United States (6)
(Same as HILD 7CW.) A writing-intensive version of Third World Studies 7C that teaches writing and analytical skills in conjunction with the study of the comparative ethnic history of the United States. Of central concern will be Chicanos, race, oppression, mass migrations, ethnicity, city life in industrial America, and power and protest in modern America.

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. (FW,S)

21W, 22W, 23W. Third World Literatures (6-6-6)
A writing-intensive version of TWS 21, 22, 23 that teaches writing and analytical skills in conjunction with the study of cultures of various Third World countries through close reading of selected literary texts.

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.

24W. Origins and Consequences of Underdevelopment (6)
(Same as HILD 4AW.) A writing-intensive version of Third World Studies 24 that teaches writing and analytical skills in conjunction with the study of the history of the Third World

peoples of Asia, Africa, and Latin America (surveyed from the fifteenth century to 1900).

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)

25W. China and the West (6)
(Same as HILD 4BW.) A writing-intensive version of TWS 25 that teaches writing and analytical skills in conjunction with the study of eighteenth-, nineteenth-, and early twentieth-century China.

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 America, 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)

26W. Third World: Nationalist Rebellions and Economic Development (6)
(Same as HILD 4CW.) A writing-intensive version of TWS 26 that teaches writing and analytical skills in conjunction with the study of nationalist movements in Africa, Asia, and Latin America.

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.

133. Contemporary Chicano Issues (4)
The course, interdisciplinary in nature, will study the contemporary Chicano experience from cultural, social, and historical perspectives, and provide students with information and understanding of the important characteristics of the Chicano community by providing a critical analysis of the societal context in which "La Raza" has sought to maintain and develop its culture. *Prerequisite: consent of instructor.*

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:

■ **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
- HIUS 112. The Era of Civil War and Reconstruction
- HIUS 135. Slavery and the Slave Trade in Comparative Perspective
- HIUS 136. Slavery and Freedom in Nineteenth-Century America: Images and Realities
- HIUS 158. Social and Economic History of the Southwest: I
- HIUS 159. Social and Economic History of the Southwest: II
- HIUS 167. Topics in Mexican American History
- HIAF 110. History of Africa to 1880
- HIAF 111. Modern Africa since 1880
- HIAF 120. History of South Africa
- HIAF 130. African Society and the Slave Trade
- HIAF 140. Economic History of Africa
- HIAF 160. Special Topics in the Economic History of Africa
- HIAF 161. Special Topics in African History

HIEA 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

■ **LITERATURE**

General

- 130. Novel and History in the Third World
- 132. Introduction to African Oral Literature
- 133. Introduction to Literature and Film of Modern Africa
- 135. Contemporary Caribbean Literature
- 136. Latin American Literature in Translation
- 137. Mexican Literature in Translation
- 140A. Classical Chinese Literature
- 140B. Modern Chinese Literature
- 140C. Contemporary Chinese Literature
- 142A-E. Earlier Japanese Literature
- 143A-E. Later Japanese Literature
- 145. Topics/Japanese Literature
- 146. Japanese Works/Authors

English

- 180. Chicano Literature in English
- 182A-B. Development of Afro-American Literature
- 183. Afro-American Prose
- 184. Afro-American Poetry
- 185. Themes in Afro-American Literature
- 186. Harlem Renaissance
- 187. Black Music: Communication and Culture

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
- 150. The Development of Chicano Literature
- 151. Themes and Motifs in Chicano Literature
- 152. Chicano Prose
- 153. Chicano Poetry
- 154. Chicano Theatre
- 160. Spanish Phonetics
- 162. Spanish Language in the United States
- 163. Spanish Language in America

- 172. Indigenista Themes in Spanish-American Literature
- 173. Spanish American Literary History

■ **MUSIC**

- 126. Introduction to Oral Music
- 127A-B. Music of Black Americans

■ **PHILOSOPHY**

- 152. Philosophy and Literature

■ **SOCIOLOGY**

- 146. Social Stratification
- 151. Comparative Race and Ethnic Relations
- 185. Political Economy of Development and Underdevelopment
- 187. African Society through Film
- 188A. Community and Social Change in Africa
- 188B. Chinese Society
- 188C. Social Change in Modern India
- 188D. Latin America: Society and Politics

■ **THEATRE**

- 141. Modern Black Drama
- 142. Chicano Dramatic Literature
- 187A-B. Chicano Theatre: Ensemble
- Black Theatre: Ensemble

Students wishing to include additional related courses from these and other departments should consult a Third World studies adviser.

▼ **URBAN STUDIES AND PLANNING**

223 Cognitive Science Building

Professors

- Michael E. Parrish, Ph.D., *History*
- Faustina Solis, M.S.W., *Community and Family Medicine*
- Charles W. Thomas, Ph.D., *Urban Studies and Planning*

Associate Professors

- Rae Lesser Blumberg, Ph.D., *Sociology*
- Amy Bridges, Ph.D., *Political Science, Coordinator, Urban Studies*
- Steve Erie, Ph.D., *Political Science*

Assistant Professors

- William Deverell, Ph.D., *History*
- Robyn S. Phillips, Ph.D., *Economics*

Director of Field Studies

Keith Pezzoli, M.A.

Adjunct Lecturer

Barbara L. Brody, M.P.H., *Assistant Clinical Professor of Community and Family Medicine*

Associated Faculty

Wayne Cornelius, Ph.D., *Political Science*
 Robert F. Engle, Ph.D., *Economics*
 Claudio Fenner-Lopez, M.A., *Communication*
 Michael P. Monteon, Ph.D., *History*
 Alan M. Schneider, Ph.D., *AMES*

Visiting Lecturers and Visiting Associate Professors

Nico Calavita, D.Arch., *Urban Design*
 Thomas Crandall, M.S., *Environmental Planning*
 Lawrence Herzog, Ph.D., *Border Studies*
 Joseph Martinez, A.I.A., *Urban Design*
 Paul Peterson, J.D., *Land Use*

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 single 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. The upper-division field studies sequence allows students to work on specific policy projects in the San Diego region.

Urban studies and planning provides an undergraduate community of students with diverse interests and goals. After graduation some majors pursue graduate work in social science disciplines. Others pursue graduate study in public policy, law, planning, architecture, or design. Urban studies has always also attracted students interested in medicine and public health issues, and these students may 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 govern-

ment, 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, internship, and senior seminar

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 (4)
- USP 107. Urban Politics (Political Science 102E) (4)
- USP 131. Community Dynamics and Ethnicity (4)

Senior Sequence Requirement

In their senior year, all students must take the senior sequence of field work, internship, and seminar. 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.

- USP 186. Urban Fieldwork Seminar (6)
- USP 187. Urban Studies Internship (6)

Students must take the senior seminar (USP 190) as a graduation requirement. In this seminar, students will complete a substantial research paper based upon their fieldwork and internship experience.

- 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 106. Contemporary Urban Issues
- USP 128. Poverty in Urban America
- USP 120. Urban Social Problems
- USP 150. Black Ghetto
- USP 152. Social-Psychological Aspects of Black Identity
- USP 160. Western Environmental History
- Political Science 100G. American Politics and Public Policy
- Political Science 102J. Advanced Topics in City Politics
- Political Science 106. Bureaucracy
- Political Science 103A. California Politics
- Political Science 160AB. Policy Analysis
- Political Science 138. Political Economy of Urbanization
- Political Science 100H. Race and Ethnic Politics
- Anthropology 116. Urban Anthropology
- History (HILA) 115. Latin American City, a History
- Sociology 149. Theory of Social Problems
- Sociology 150. Equality and Inequality
- Sociology 151. Comparative Race and Ethnic Relations

Courses

LOWER DIVISION

Sociology 153. Urban Underclass
Sociology 148E. Ethnicity and Politics
Sociology 159. Asian Americans
Economics 130. Public Policy
Economics 152. Topics in Public Economics
Economics 155. Public Choice
Economics 179. Management in the Public Sector
Economics 134. Regional Economics

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 108. Regional Planning and International Development
USP 115. Urban Transportation Planning
USP 117. Technology of Cities
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 146. Case Studies in Health Care Programs/Children and Families
USP 147. Case Studies in Health Care Programs/Poor and Underserved Populations
USP 148. Health Policy and Planning
USP 171. Practical Land Use Problems
USP 173. History of Urban Planning and Design
USP 174A. Introduction of Urban Design
USP 174B. Practice in Urban Design
Economics 131. Economics of the Environment
Economics 138. Economics of Health
Political Science 166F. U.S. Welfare State
Sociology 117. Language, Culture, and Education
Sociology 126. Social Organization of Education

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.

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.

2W. Urban American Society—Writing Practicum (6)

An intensive writing course accompanying USP 11 (Urban American Society) which teaches writing skills focused on topics related to cities in American society.

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.

3W. Introduction to Urban Planning—Writing Practicum (6)

An intensive writing course aimed at improving student writing skills using topics related to the theme of urban planning, urban design, and the environment. To be taken with USP 12.

UPPER DIVISION

101. Applied Statistics for Urban Studies and Planning (4)

Introduction to statistical and quantitative methods using applications from urban studies, planning, and policy analysis. Includes descriptive statistics, measures of association, inference, hypothesis testing, statistical significance and linear regression. Required of USP majors who have not previously taken Social Science 60, Psychology 60, or Sociology 109.

102. Urban Economic Problems (4)

(Same as Econ. 135.) Analysis of causes of congestion, pollution, housing and discrimination and segregation, crime, etc., and of public policies to deal with these problems. *Prerequisite: one year of lower-division economics.*

103. U.S. Cities in the Twentieth Century (4)

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.)*

106A-B-C. Contemporary Urban Issues (4-4-4)

A research-oriented course focusing on institutions and communities in the urban area. Readings will be drawn from social science studies on urban issues and from studies on policy and planning. It integrates theoretical approaches to the study of various urban issues with applied supervised research. *Prerequisites: upper-division standing and consent of instructor. See department.*

107. Urban Politics (4)

(Same as Political Science 102E.) This survey course focuses upon the following six topics: the evolution of urban politics since the mid-nineteenth century; the urban fiscal crisis; federal/urban relationships; the "new" ethnic politics; urban power structure and leadership; and selected contemporary policy issues such as downtown redevelopment, poverty, and race. *Prerequisite: upper-division standing or consent of instructor.*

108. Regional Planning and International Development (4)

An introduction to the theories and techniques of analysis central to the field of regional planning. Discussions include the following topics: location theory and economic development, central place theory; urban hierarchies; urban systems, gravity models, regional-industrial composition; economic base; input-output analysis; growth pole theory; regional growth theory. The course also provides practical examples of the use of these techniques in international development planning in Latin America. *Prerequisite: none.*

115. Urban Transportation Planning (4)

An introduction to the field of transportation planning in cities. Lectures will cover the history of urban transport, transport and land use models; and economic and technical discussion of the viability of specific modes of transport including buses, electric transit, private automobiles, taxis, trucks, bicycle, and pedestrian movement. *Prerequisite: upper-division standing.*

117. The Technology of Cities I: Pollution, Water, and Wastewater Treatment (4)

A set of lecture-discussion courses which introduce students to the environmental problems caused by urban activities, and to the economic and technological aspects of the provision of important urban services such as water, transportation, sewerage, and energy. USP-117 deals with the causes, nature and abatement of urban air and water pollution, with the provision of potable water and with the treatment and disposal of wastewater. The course will be of special interest to students wishing to pursue careers in urban public administration, physical urban planning, and applied economics. *Prerequisite: upper-division standing 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.*

120. Urban Social Problems (4)

(Same as Sociology 152.) Concerns the facts and theories of contemporary urban social problems in the United States. The emphasis will be on social problems, not on urbanism. Topics may include: urban poverty; inequality based on sex, age and race; crime and deviance; urban environment, pollution, housing, transportation, and health; fiscal crisis and the politics of municipal finance, including the role of ideology and interest groups in the definition of social problems. *Prerequisite: any lower-division sociology course.*

123. Housing Policy (4)

(Same as Econ. 133.) Examines current issues in housing policy; housing finance, rent control, neighborhood decline and revitalization, gentrification and displacement, home-ownership affordability, segregation and discrimination, and low-income housing. *Prerequisite:* one year of lower-division economics.

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.

131. Community Dynamics and Ethnicity (4)

An examination of the interaction of migration and urbanization on community as a social system. Characteristics of agencies and organizations which deliver services or influence changes will be approached from the use of ethnicity as a conceptual model. *Prerequisites:* USP 131L (concurrently), upper-division standing, USP major, consent of instructor. See department.

131L. Community Dynamics and Ethnicity Lab (2)

Models for human service delivery, community development, action, and planning will be taught through exercises and individual projects. *Prerequisite:* USP 131 concurrent enrollment.

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 socio-economic 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)

146. Case Studies in Health Care Programs/Children and Families (4)

The purpose of this course is to identify the special health needs of children, youth and families and to review their status of care, factors influencing incidence of disease and health problems, and political and legislative measures related to the provision of care. Selected programs and policies that address health promotion and current health problems such as developmental disabilities, child abuse, teenage pregnancies, and inju-

ries will be analyzed. Offered in alternate years. *Prerequisite:* upper-division standing or consent of instructor.

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:* USP 143 or consent of instructor.

148. Health Policy and Planning (4)

Outlines determinants of community health, trends in health needs and resources, evaluates performance in meeting needs, analyzes factors accounting for performance, and explores means and prerequisites for improving that performance. Focus on San Diego. *Prerequisites:* USP 144A-B, upper-division status or 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. Social-Psychological Aspect of Black Identity (4)

This course examines formal theory on personality formation in terms of the life-style of Afro-Americans. Emphasis is devoted to the interdependence between personal characteristics, Afro-American culture, and the social conditions which foster blackness as a personality construct. *Prerequisite:* upper-division standing or consent of instructor. See department.

152. Adult Development and Aging (4)

An examination of the developmental stages of early, middle, and late adulthood and their processes of behavior change. Topics include impact of societal and cultural factors, continuity and change in the individual personality, influence of norms and roles, family life, adult sexuality, and ethnicity as a cultural experience in human development.

153. Society, Motivation, and Personality (4)

This course will provide an examination of the interplay between values, activities, and emotional components of behavior. Topics to be covered in depth include social support systems, understanding values, motivations and drives, basic needs and their gratification, coping and expression, and psychological health. *Prerequisites:* USP 152B, upper-division standing, or consent of instructor. See department.

160. Western Environmental History (4)

This course is an examination of settlers' interaction with the western American environment. The course will focus on the distinction between the objective environmental understanding of science and natural history and the subjective views of settlers and historians. Was there ever a "virgin land" in the West? What are the most compelling environmental issues in the West today?

171. Practical Urban Land Use Problems (4)

A lecture-discussion course on the relationship between American legal institutions and land use policy issues, with special attention to the problems of urban areas and the conflict between private rights and the public interest. Among the topics covered are the legal aspects of zoning, redevelopment, transportation, and the protection of the natural environment. *Prerequisite:* none.

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)

(Same as Visual Arts 174.) This course will introduce the elements of urban design and examine the factors necessary for the execution of an urban design plan. Students will look at the city of San Diego as a place of urban design in a structured exercise designed to teach how to examine a city qualitatively from an urban design/urban planning point of view. The special geographical and political forces that help shape San Diego's urban design future will be examined through the review of current planning projects. The possibilities of what may be done to enhance urban design in San Diego will also be examined. *Prerequisite:* upper-division standing.

174B. Practice in Urban Design (4)

Through seminars and related studio work, lectures and case studies, the course will focus on the approaches toward complex interrelationships of land use programs, infrastructure, transportation issues, public open space, economic feasibility, social values, and aesthetics which will be investigated and related to the understanding of public benefits and private enterprise. The studio section of the course will deal with determining optimum building envelope relationships, site organization, ambience, environmental chart, image, and user needs in selected urban areas. Particular attention will be paid to developing skills in communication concepts and ideas. *Prerequisite:* upper-division standing or consent of instructor.

175. Environmental Problems of Urban Studies (4)

Man's activities have had dramatic impact upon the natural resources of California's urban areas. The class will focus upon the nature and extent of such impacts with an emphasis on evaluating the current status of resource-related planning on management efforts. Major themes will include politics of resource protection; provision of parks and open space; preserving natural area; wildlife management; air and water quality issues; land use planning by state agencies; protecting agricultural lands and guiding the location of new development. The goal of the course is to provide the student with a better understanding of the ways in which the natural resources of urban areas are being protected and planned for by government agencies and the limitations of current programs. *Prerequisite:* upper-division standing.

186. Urban Fieldwork Seminar (6)

Seminar on the use of qualitative field research methods in an applied urban setting. Course will cover theories of neighborhood planning conflict (location conflict). Students will then use systematic observation, interviews, and surveys to carry out a major field research project in a selected neighborhood in the San Diego region. Students will learn organization, testing, and application of survey instruments in the field. Oral reports, exam, and field research paper required.

187. Urban Studies Internships (6)

Students work with the field studies instructor in the Urban Studies and Planning Program and select an internship with a local planning agency or other professional activity pertinent to their career interests. Students spend ten hours per week as interns with the agency. Students must prepare a paper reporting on their internship experience. *Prerequisites:* USP 186, senior standing, departmental stamp required.

190. Senior Seminar (4)

Based upon their previous fieldwork courses and internship, students will write a substantial research paper on a current urban policy issue. The seminar will rotate from year-to-year among the faculty in urban studies and planning. *Prerequisites:* USP 185, 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.

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.

Madlyn M. Kahr, Ph.D., *Professor Emeritus*

Allan Kaprow, M.A.

Kim MacConnel, M.F.A.

Faith Ringgold, M.A.

Jerome Rothenberg, M.A.

Italo Scanga, M.A.

Jehanne Teilhet-Fisk, Ph.D.

Associate Professors

Louis Hock, M.F.A.

Standish Lawder, Ph.D.

Fred Lonidier, M.F.A.

Babette Mangolte

Sheldon Nodelman, Ph.D.

Patricia Patterson

Ernest Silva, M.F.A.

Phel Steinmetz

Assistant Professors

Steve Fagin, M.A.

Jack Greenstein, Ph.D.

Susan Smith, Ph.D.

Adrienne von Lates, Ph.D.

John Welchman, B.A.

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, which provides faculty offices and studio spaces for graduate students. In addition, many of the faculty have studios near the Matthews Administrative and Academic Complex, 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.

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 Revelle fine arts requirement, 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*

*Normally, VA 112 is taken during the third year after completing requirements listed under Group II-Distributional Requirement.

GROUP II—Distributional Requirement

5 courses

One course from each of the following areas:

A. Criticism and Theory

- 113A History of Criticism I
- 113B History of Criticism II
- 113C History of Criticism III

B. Ancient

- 120A Greek Art
- 120B Roman Art
- 120C Late Antique Art

C. Medieval/Renaissance/Baroque

- 122A Art of the Middle Ages
- 122B Renaissance Art
- 122C Baroque Art

D. Modern

- 124A Art of the Eighteenth Century
- 124B Art of the Nineteenth Century
- 124C Art of the Twentieth Century

E. Non-Western

- 126A African and Afro-American Art
- 126B Polynesian Art
- 126C Melanesian Art
- 126D Art of the Southwest American Indians

GROUP III—Area Specialization

2 courses

Two courses in one area of specialization from the following list. At least one of these must be a seminar (indicated by *). In seminars, students will be expected to give reports and undertake independent research.

A. Criticism and Theory

All courses listed under Group II.A.

- 113D History of Criticism IV
- 114 Art Criticism
- *117 Narrative Structure in the Visual Arts
- 118 Landscapes, Grottos, and Fountains
- 128A Topics in Art Criticism and Theory
- *129A Special Problems in Art Criticism and Theory

B. Ancient

- 121A Prehistoric Art
- 128B Topics in Ancient Art
- *129B Special Problems in Ancient Art

C. Medieval/Renaissance/Baroque

- 123A Italian Art of the Early Renaissance
- 123B High Renaissance Art
- 123C Michelangelo
- *123D The City in Italy

*indicates seminar

- 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 Albert Dürer and the First Media Revolution
- 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

- 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.

- *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 programs in the media arts, to seek careers in commercial film, television or photography, or to develop as independent artists.

**FOUNDATION LEVEL—
Lower-Division**
(7 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
- Comm/Gen 20 Introduction to Communication

Group B

- VA 60 Introduction to Photography
- VA 70 Introduction to Media I (Technique/History)
- VA 71 Introduction to Media II (Theory)

A total of seven courses from Groups A and B are required. Any and all courses except VA 70, 71, and 174 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**
(7 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 173 Field Video
- VA 186 16mm Film Strategies

Photography Emphasis

- VA 165 Camera Techniques
- VA 167 Photo Strategies

Group B—History, Criticism, and Theory

2 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: VA 158 is required for all students with photography emphasis.

ADVANCED LEVEL—Upper Division
(6 courses required)

- VA 177 Scripting and Editing Strategies
- VA 178 Experimental Media
- VA 179 Narrative Media
- VA 180 Documentary Media

All four of the above are required. Additionally, two electives must be taken. VA 178, 179 or 180 are repeatable for credit as electives, or choose two from the following list.

Electives

Two 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 187 Animation
- VA 188 Optical Printing

Photography Electives:

- VA 166 Camera Techniques
- VA 168 Color Techniques

A total of twenty courses are required for the media major:

- 7 Foundation Level
- 7 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, pho-



*indicates seminar

tography, 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.

Personal Interview—Interviews may on occasion be requested by the Admissions Committee for prospective candidates.

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 issues in domains other than art that have bearing on the student's process, thought, and work.

Work—Students are asked to submit documentation of their best work in a suitable format such as slides, videotape, film, photographs, etc. These will be returned upon review of the application. It is necessary to include a self-addressed, stamped envelope for return of work.

REGULAR UNIVERSITY ADMISSION POLICIES

Please note that no application will be processed until all required information has been received. Students should submit applications to the graduate admissions office on or before January 15, 1991. 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.

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.

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.

11. Western Art I: Prehistoric to Medieval (4)

Works of art are tools through which humanity has struggled to understand and deal with the world, with society, and with the self. This course provides an overview of the development of Western art in its principal phases from the earliest times to the twelfth century A.D., and serves as the foundation for subsequent, more detailed studies in the history of art. Visual images first appear in the cave paintings and carvings of the hunting people of Ice Age Europe—an art of astonishing power and mysterious meaning. The village cultures which subsequently developed in the Near East grew in the Bronze Age into great civilizations, urban, literate, and highly structured, which gave rise to the first monumental art, expressing the new power and confidence of human society. The rational geometry of this Bronze Age art was transformed in the art of classical Greece into the vehicle for a heightened individual self-consciousness, which became more complex and more subjective in the imperial art of Rome. During the early Middle Ages—Byzantine, Carolingian, and Romanesque—new visions of otherworldly spirituality dissolved this classical formal language and recast it as the foundation of later European art. The arts of these cultures will be examined through the analysis of major monuments of architecture, sculpture and painting, with specific attention to the communicative function of the work of art as seen in relation to contemporary society and culture.

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.

13. Non-Western Art (4)

Nonliterate societies have created modes of art and expression profoundly different from those developed by societies based on technology and written communication. Traditional art forms from the Arctic and North-West Coast, Melanesia, Polynesia, and West Africa will be considered along with ephemeral constructions, 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—models which can throw a surprising light on artistic practices and ideologies of Western culture.

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, Taeluber-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.

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.*

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.*

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. The basic applicable scientific principles of light, optics, and electricity, as well as the evolution of media technology and theory will be covered. Conceptualization/preproduction strategies will be emphasized during laboratory periods and specific group exercises will be performed with 1/2" and 3/4" video equipment to gain a basic grasp of the techniques and to impart adequate levels of control. 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 extends the previously discussed topics, sophisticating the students' understanding, and emphasizing idea development and the analysis of the creative processes. The general principles of film and electronic media as language systems, the notion of a critical attitude, and the social effect/function of media will be covered, both in its current status and its potential for the future. Film and video will be contrasted and compared as technologies and information systems. Various examples of both

media will be shown in class to illustrate documentary, narrative, and genre traditions. An extension of the conceptualization/preproduction strategies and development of postproduction/editing strategies will be directly applied to the students' work in 3/4" video. 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.

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: 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 audiences. Autobiographical (solo) and social (group) performance, narrative performance, objects and spaces that perform, games and entertainments, rituals and transcendental performance are among the topics that may be covered. *Prerequisite: 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: 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 draftsman-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

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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: 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,B,C,D,E,F,G,H,I,J. Sculpture

A— 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: VA 1, 2, 3 and either 14 or 111.*

B— 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.*

C— 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.*

D— 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 narra-

tion. May be repeated once for credit. *Prerequisite: VA 107A or consent of instructor.*

E— 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.*

F— 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.*

G— 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.*

H— 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.*

I— 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.*

J— 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.

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.*

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)

From the early fourth to the late fourteenth century, Western European artists pursued a course which diverged radically from the classical legacy of Greece and Rome in order to explore the new Christian vision of man and his relation to God and the world. This introduction to the art of the Middle Ages takes a topical, rather than chronological, approach to this stimulating period in which competing claims of spirit and flesh often collided in art works of dazzling beauty and complexity. Topics to be covered include the creation of sacred space in architecture, painting and sculpture, together with the violation of sacred space in the upside-down world of monsters and grotesques in the margins of medieval art; abstraction and naturalism in the depiction of the human body and shifting attitudes towards the art of antiquity; and medieval theories of the visual image. *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 Durer 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 pro-

vided 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.*

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 the two archetypes which dominated the period's view of women, but saints, witches, goddesses, 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. *Prerequisite: none; Western Art II (VA 12), Art of the Middle Ages (VA 122A), and/or Renaissance Art (VA 122B) recommended.*

123M. Baroque Architecture (4)

During the seventeenth century, three great architects—Bernini, Cortona, and Borromini—changed the urban structure of Rome, making it the dramatic and magical city it is today. 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.*

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, Tauter-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, Wigman, Laban, Graham, Cunningham, and Rainer. *Prerequisite: none.*

125F. History of Twentieth-Century Sculpture (4)

Sculpture reemerged as a major art form in the twentieth century. Beginning with the playful experiments of Picasso, the Readymades of Duchamp and the primordial purism of Brancusi, the notion of sculpture has been subjected to a continuous set of transformations. By the early 1920s, many new possibilities opened up: the comical constructions of the dadaists, the dream constructions of the surrealists, the utopian fantasies of the Russians, and the functional aspirations of the Bauhaus designers. Political developments in Eastern and Western Europe led to an ideological and fashion-driven resurgence of neo-representational sculpture in German and Italian fascist works and to applied art deco styles in America and

France. At the end of the Second World War, the energies of sculpture were liberated once again to produce abstract expressionist and neo-dada sculpture: the work of David Smith, Jasper Johns, and Louise Nevelson. Styles and genres proliferated wildly in the late 1960s and early 1970s as sculptors drew upon a wide range of artistic and craft precedents. These new styles included minimal, site-specific and earthwork modes, and a variety of systems art bearing on technological, psychological, social, ecological, and political concerns. *Prerequisite: none; Nineteenth- and Twentieth-Century Art (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 arts, dance, and myths of Polynesia evoke romantic visions, perhaps because it was one of the last areas on earth to be inhabited, as well as being the last major culture to be rediscovered by the West. 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, Samoa, and Fiji. The role of the Maori artist as *Tohunga*, the symbolic council houses and the significance of tattooing will also be given special attention. *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 phe-

nomena 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, ways of animating the surfaces of sculpture and painting, of using volume free from the precision of classical proportions, and of evoking space without the single viewpoint. 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 and free of the stifling constraints of bourgeois society. 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. 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 quarter 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 intensive investigation into the form, history, and meaning of the silent cinema from its inception as a nineteenth-century optical toy to its fullest expression in the works of such masters as D.W. Griffith, Charlie Chaplin, Eisenstein, Vertov, Vigo

and others, with particular emphasis on the interrelationships between film and the other visual arts of the period. 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 Dali, 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. Students will develop a critical approach based on these relationships and explore this approach through short essays and a term paper. Topics include storytelling, performance and video, docu-art work, and video art on television. 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.*

VISUAL ARTS

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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.

167. 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.

168. Color Techniques in Photography (4)

Instruction in color photography and printing. Lectures on the 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. Assignments will be done collaboratively and/or individually and critiqued by the class and the instructor. Tapes by independent video artists will be shown and discussed in terms of technique and style. *Prerequisites:* VA 60, 70, 71, 111, and 174.

173. Field Video (4)

A production course emphasizing portable field video as a creative medium. Students will conceive, script, produce, direct, and edit short video assignments. This production and critique cycle is the basis of the course. Tapes by independent video artists will be shown and discussed. *Prerequisites:* VA 60, 70, 71, 111, and 174.

174. Media Sketchbook (4)

A first experience in formulating ideas and images for creative media production. Emphasis is upon original and inventive conceptualization and realization, as students perform in all aspects of video—planning, camera, performance, production—in their own works and crewing for each other. 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.

177. Scripting and Editing Strategies (4)

The aim of this course is to familiarize students with pre-production and post-production techniques (shooting script, storyboard, continuity notes, etc.), their relationship and their interdependence. Students will be given the task of developing at least three short narrative or documentary scripts (three minutes in length) from the writing stage to the shooting script and storyboard stage. They will be required further to shoot and edit one of these scripts and to present the instructor with organized notes taken during the editing process. Collaborative projects may be done. *Prerequisites:* VA 70, 71, and 174, and two production courses (taken from 165, 167, 172, 173, and 186).

178. Experimental Media (4)

A production course investigating a wide range of exploratory work in film, video, or photography. The course will concentrate on those works that fall outside the fixed genres of narrative and documentary or work on their boundaries. Several individual projects are required. May be repeated twice for credit. *Prerequisites:* two required from VA 165, 167, 172, 173, 177, 186; VA 177 strongly recommended.

179. Narrative Media (4)

A production course exploring 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 165, 167, 172, 173, 177, 186; VA 177 strongly recommended.

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. Final project required. May be repeated twice for credit. *Prerequisites:* two required from VA 165, 167, 172, 173, 186; VA 177 strongly recommended.

181. Sound and Lighting (4)

An advanced course aimed at gaining a sophisticated control on the application of sound and lighting theory. Examples in film and video will be screened and discussed. The sonic portion of the course will trace the evolution of film and video recording and manipulation, emphasizing current practice and equipment. The areas of acoustics fundamental electronics, microphones and recording devices, and the general theories of sound image relationship will be covered. The second portion of the course will study the theory and practice of illumination for film and video production. The strategies, processes, and equipment for both studio and location lighting will be covered. Each student will produce a project for each section of the course. *Prerequisite:* one from either VA 172, 173, or 186.

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. Students will edit stock material as well as generate their own materials for editing a final project. The aesthetic and technical similarities and differences of the film and video media will be a major topic. Course may be repeated twice for credit. *Prerequisite:* VA 177 and either 172, 173, or 186.

186. 16mm Film Strategies (4)

This production course is designed to heighten the students' understanding of film theory and practice utilizing 16mm gauge film. The techniques of camerawork, lighting, editing, sound, printing, and processing will be covered. Students should anticipate spending large quantities of time outside class on their projects. A final project will be required. The supplies provided by the student for this course are more expensive than for other production courses. *Prerequisites:* VA 1 or 2 or 3, 14, 60, 70, 71, 84 and 174.

187. Animation (4)

Founded in a historical context of personally produced work, beginning with Emile Cohl and continuing through contemporary work, this production course will cover both the theory and technique of film animation. Video animation will be discussed. Drawn, cell, object, and collage animation will be explored. Students should anticipate spending large quantities of time outside of class on their projects. Each student will be expected to complete several assignments as well as a three- to five-minute 16mm film. 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 manipula-

tion 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.

195. Teaching in Visual Arts (4)

Each student will meet with a section once a week under the direction of the instructor. The student will be required to attend the lecture in the course and to meet with the instructor at least once each week. May be repeated three times for credit. *Prerequisite:* consent of instructor.

NOTE: Only open to highly advanced upper-division students. Requires both instructor's and department chairperson'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: Only open to upper-division students. Requires instructor's, department chairperson'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: Only open to upper-division students. Requires instructor's, department chairperson'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-presentation 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.

290D. Graduate Seminar (4)

Studio Critiques

This course will be devoted to rigorous, in-depth critiques of the students' ongoing and previous work. A member of the class (but not the person whose work is being focused on) will take a turn leading the discussion each week. Offered during winter quarter of each year and required of all second-year students.

295. Individual Studies for Graduate Students (1-12)

Individual research for graduate students in preparation for their comprehensive examinations 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.



OFFICE: Literature Building, Second Floor, Warren Campus

THE WRITING PROGRAM

OFFICE: Building 410, Matthews Administrative and Academic Complex

Warren College 10A-10B is required of every Warren College student and must be taken immediately following completion of the Subject A requirement. The purpose of the sequence is to teach students, through constant practice and coaching, to read carefully, to communicate authentically in writing, and to criticize with a sense of the demands of varying contexts. Classes are very small and center on group discussion of student work.

The course emphasizes a variety of forms and aims of writing, and includes attention both to narrative and to analytical and argumentative writing based on sources. The readings focus on the general theme of the relation of the individual and society, with a marked emphasis on the American tradition. Thus, the readings help to prepare the students for work in the Ethics and Society course. Readings may include novels, essays, biographies, sermons, political documents, and book-length nonfictional treatments of the theme.

In both 10A and 10B, student papers are duplicated, distributed in class, and discussed by the class as a whole in a workshop setting. Each student also attends individual conferences with the instructor. Every student receives a mid-quarter evaluation and a final narrative evaluation which is placed in the student's file. The minimum writing requirement is 8,000 words per quarter. Warren College 10A-10B is offered P/NP only, and students may not test out of the requirement.

10A-10B. The Writing Course (4-4)

A workshop course in reading and writing required of all Warren College students. The course emphasizes a variety of forms and aims of writing and includes attention both to narrative and to analytical and argumentative writing based on sources. *Prerequisite: satisfaction of the university Subject A requirement.*

THE SCHOLARS PROGRAM

OFFICE: Warren Scholars Program, Literature Building, Second Floor, Warren Campus

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 stu-

dents educational, cultural, and social experiences designed to help students broaden their intellectual interests beyond their major. An annual reception is held in their honor with participating faculty and key college staff. 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 that result in automatic admission of entering UCSD students to the program are a high school GPA of 3.8 and an SAT score of 650 in verbal and 650 in mathematics. 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, Q-022, 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 an honors research paper in conjunction with an independent study supervised by a faculty member. Scholars may replace one upper-division course in a minor (program of concentration or area study) with the independent study.

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 texts will be selected in order to form a coherent and detailed investigation of issues central to the relation of man and society. The first quarter will ex-

plore topics relating to man's view of himself, and the second quarter will focus on man's view of 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.

ETHICS AND SOCIETY

OFFICE: Academic Advising, Literature Building, Second Floor, Warren Campus

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.

HEALTH CARE—SOCIAL ISSUES

OFFICE: Interdisciplinary Programs, Literature Building, Second Floor, Warren Campus

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 Campus

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 Campus

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."

WOMEN'S STUDIES

OFFICE: 2024 Humanities & Social Sciences Building, Muir College, 534-3583

COORDINATOR: Kathryn Shevelow, 101 Third College Humanities Building, 534-2138

Affiliated Faculty

Professors

Abraham Dijkstra, Ph.D., *Literature*
 Page duBois, Ph.D., *Literature*
 Frances Foster, Ph.D., *Literature*
 Helene Keyssar, Ph.D., *Communication*
 Susan Kirkpatrick, Ph.D., *Literature*
 Louis Montrose, Ph.D., *Literature*
 Chandra Mukerji, Ph.D., *Sociology/*
Communication
 Carol Plantamura, M.F.A., *Music*
 Jacqueline Wiseman, Ph.D., *Sociology*

Associate Professors

Rae Blumberg, Ph.D., *Sociology*
 Susan G. Davis, Ph.D., *Communication*
 Stephanie Jed, Ph.D., *Literature*
 Rachel Klein, Ph.D., *History*
 Carol Padden, Ph.D., *Communication*
 Fitz John Porter Poole, Ph.D., *Anthropology*
 Mary Ruggie, Ph.D., *IRPS/Sociology*
 Kathryn Shevelow, Ph.D., *Literature*
 Shirley Strum, Ph.D., *Anthropology*
 Jehanne Teilhet, Ph.D., *Visual Arts*
 Sandra Vehrencamp, Ph.D., *Biology*
 Cynthia Walk, Ph.D., *Literature*

Assistant Professors

Mounira Charrad, Ph.D., *Sociology*
 Nicole Hoffman, Ph.D., *Literature*
 Beth Holmgren, Ph.D., *Literature*
 Martha Lampland, Ph.D., *Sociology*
 Lisa Lowe, Ph.D., *Literature*
 Stephanie McCurry, Ph.D., *History*
 Jennifer Robertson, Ph.D., *Anthropology*
 Susan Smith, Ph.D., *Visual Arts*
 Cynthia Truant, Ph.D., *History*

Adjunct Associate Professor

Mary Walshok, Ph.D., *Sociology*

The rapid and dramatic changes in the roles of women (and men) during the last two decades have generated great interest and given rise to the serious study of the origins and meanings of gender. The Women's Studies Program at UCSD is designed to promote teaching and scholarship in a wide range of disciplines—literature, sociology, communication, history, and philosophy, to name just a few. The goal of the program is to understand the social, historical, economic, and biological dimensions of "women's place."

The centerpiece of the program is a women's studies minor open to undergraduates in all colleges. The minor consists of six courses as follows: the three-course lower-division sequence titled Cultural Traditions 2A-B-C: Introduction to Women's Studies; three upper-division courses selected from a group of courses which have been approved by the Women's Studies Advisory Committee and the Committee on Educational Policy. Of the three upper-division courses, no more than two may come from the same department.

To facilitate student advising there is a coordinator of the Women's Studies Program. In addition, women's studies faculty will be working with counselors in each college and with students from the Women's Center to help students explore their interests within the minor, and to pursue independent projects of study and reading.

Courses

Approved for the Women's Studies Minor

LOWER DIVISION

Cultural Traditions 2A. Introduction to Women's Studies: Gender in History and Culture (4)

This course will focus on manifestations of gender difference in the history and literature of one or more cultures, studying the social construction of gender both in the symbolic representations and institutionalized practices of a given society and period.

Cultural Traditions 2B. Introduction to Women's Studies: Gender and Identity (4)

This course will emphasize gender and the individual, with consideration of psychological, sociological, biological, and anthropological notions of gendered identity.

Cultural Traditions 2C. Introduction to Women's Studies: Women and Contemporary Issues (4)

This course will treat specific issues of social policy that affect women in particular. Topics may include abortion, reproductive rights, new reproductive technologies, and the feminization of poverty.

Anthro. 49. Japanese Culture and Society (4)

This course, open to all interested students, provides a multi-perspective view of postwar Japanese cultural productions and social institutions that challenges facile stereotypes of both U.S. and Japanese origin. The subjects and issues explored include urban vs. rural life; ethnic diversity; kinship; marriage; gender and sexuality; ancestor worship; work and leisure; education; laws; and internationalization vs. nationalism. *Prerequisite: none.*

UPPER DIVISION

Cultural Traditions 102. Selected Topics in Women's Studies (4)

This course is designed to bring the interdisciplinary focus of women's studies and the perspectives developed by feminist criticism and theory to bear on a range of issues concerning

gender. Topics will vary, but they might include such subjects as gender and science, psychoanalysis and feminism, the body, interdisciplinary feminist theory, feminism and race, and reproductive technologies. May be repeated for credit as topics vary.

Anthro. 112. Femininity and Masculinity in Japan (4)

This course explores the sex/gender system as it is manifested in Japanese culture and society, both historically and in the present, in the context of more general anthropological theory. The sociocultural domains to be examined include creation myths, verbal and nonverbal communication, militarization, comic books, advertising, literature, and theatre. *Prerequisite: AN 22 or introductory anthropology course elsewhere or consent of instructor.*

Anthro. 115. Marriage and the Family in Cross-Cultural Perspective (4)

Sources of power, types of relationships, and the means by which family members seek goals will be examined in the context of the culture of the society in question. Family life in societies from various parts of the world, including the United States, will be considered.

Anthro. 122. Japanese Psychology and Psychotherapies (4)

This course explores Japanese psychology in the context of myth, self- and gender identity, interpersonal relations, class, ethnicity, family, friendship, urbanization, and conflict. In addition, varieties of psychotherapies, from Morita therapy to those crafted by the "new" religions, are examined. *Prerequisite: Anthro. 45 or Anthro. 112.*

Anthro. 129. Female, Male, and Gender: The Cultural Shape and Social Force of Sexual Difference (4)

This 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: AN 22 or equivalent introductory course at another university.*

Anthro. 146. Everyday Religiosity in Japan (4)

This course explores the different forms of religiosity that inform and are informed by popular culture and everyday life in Japan past and present. Rather than dwell exclusively on such "great traditions" as Buddhism and Confucianism, or on formal analyses of Shinto, we will focus on the popular, "common sense" dimensions and expressions of Japanese religiosity, which include shamanism, ancestor worship, votive tablets, and fortune-telling, among others. Much emphasis is placed on sex/gender differences regarding religious work, experience, and symbolism and the historical and contemporary roles of girls and women as religious specialists are examined in great detail. *Prerequisites: upper-division standing and consent of instructor if no previous Japan course.*

Anthro. 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: AN 22 or introductory anthropology at another university.*

Chicano Studies 132. La Chicana (4)

A critical perspective of the Chicana's present minority status through an exploration of relevant crucial issues (i.e., employment, education, health, family). *Prerequisite: upper-division standing.*

Comm/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: Comm/Cul 100 and Comm/Gen 100-VA 170, or consent of instructor.*

Comm/Cul 115. The Theatre of Private Life: Family and Friends (4)

(Cross-listed with Drama 146.) 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. *Prerequisites: Drama 42, 43, 44 or Comm/Cul 100 required. Comm/Gen 100-VA 170 recommended or consent of instructor.*

Comm/Cul 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.*

HIEA 125. History of Women in China (4)

This course concerns women in Chinese history from the earliest times to the present. The course will focus on women's changing roles in the family, society, and culture. *Prerequisites: upper-division standing or consent of instructor.*

HIEU 147. The History of Women in Europe: The 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: The 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.

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.

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

WOMEN'S STUDIES

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.)

Lit/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.

Lit/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.

Lit/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.)

Lit/Gen 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.

Lit/Gen 123. Women in Italy (4)

(Same as Lit/Ital 140.)

A study of historical, political, and literary texts regarding women and feminism in Italian society.

Lit/Gen 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.

Lit/Gen 189. Gender Studies (4)

The study of the construction of sexual differences in literature and culture. May be repeated for credit as topics vary.

Lit/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.

Music 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, reproductive 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.*

Sociol. 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.

Sociol. 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.

Sociol. 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.

Sociol. 133. Comparative Sex Stratification (4)

(Numbered 171 prior to 1981-82.) 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.

Vis. Art 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, goddesses, 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.*

Vis. Art 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.*

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The University of California, in compliance with Titles VI and VII of the Civil Rights Act of 1964, Title 9 of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Age Discrimination in Employment Act of 1967 and the Age Discrimination Act of 1975, does not discriminate on the basis of race, color, national origin, religion, sex, handicap, 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 special disabled veterans or veterans of the Vietnam era, or because of their medical condition (cancer-related), 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 and treatment in university employment. Inquiries regarding our equal employment opportunity program may be directed to Associate Chancellor Nolan Penn at (619) 534-6861.

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INFORMATION-UCSD

BACHELOR'S DEGREE

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The salary averages are figured according to occupational classifications.

Occupation	Average Salary
Technical	\$27,700
Managerial	\$20,500
Sales/Marketing	\$22,300
Health/Life Science	\$19,600
Financial	\$21,700
Human Services	\$17,800
Arts/Communications	\$18,700

The employment status of the graduates who sought to enter the workforce is as follows:

Employed Full-time	87%
Employed Part-time	8%
Seeking employment	5%

Source: *UCSD Graduates—A Summary of 1988 Survey Results*. Information based only on those who sought to enter the workforce immediately after graduation. Survey conducted of June 1988 graduates in December, 1988.

UCSD FACTS AND FIGURES (AS OF FALL 1989)

On-campus student enrollment	
Undergraduate	14,324
Muir	3,521
Revelle	3,382
Third	3,150
Warren	3,479
Fifth	792
Graduate	2,271
Medical School (excluding 475 Medical Center residents and interns)	525
Total Students	17,595

On-campus teaching faculty members	998
------------------------------------	-----

Members of Honorary Societies/Prizes/Awards

American Academy of Arts and Sciences fellows	53
American Philosophical Society fellows	9
Econometric Society fellows	5
Fields Medal Recipients	1
Institute of Arts and Letters	2
Institute of Medicine members	8
International Academy of Astronautics members	7
National Academy of Education members	3
National Academy of Engineering members	10
National Academy of Sciences members	52
National Medal of Science recipients	3
Nobel Prize laureates	6
Pulitzer Prize	1

Total land area—UCSD	
Main campus	1,155
Outlying areas	393
UC Natural Reserves	414
Total acres	1,962

Books in library collection	1,903,851
UCSD Extension enrollment	27,327

Grade-point averages	
Lower-division undergraduate	2.86
Upper-division undergraduate	2.92
Graduate	3.69

Number of undergraduates in most popular majors	
Biology	2,278
Applied Mechanics and Engineering Sciences	1,406
Economics	1,225
Psychology	975
Political Science	920
Electrical and Computer Engineering	845
Communication	734
Literature	526
Mathematics	476
Computer Science and Engineering	468
Physics	376
Visual Arts	365
Chemistry	311

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.

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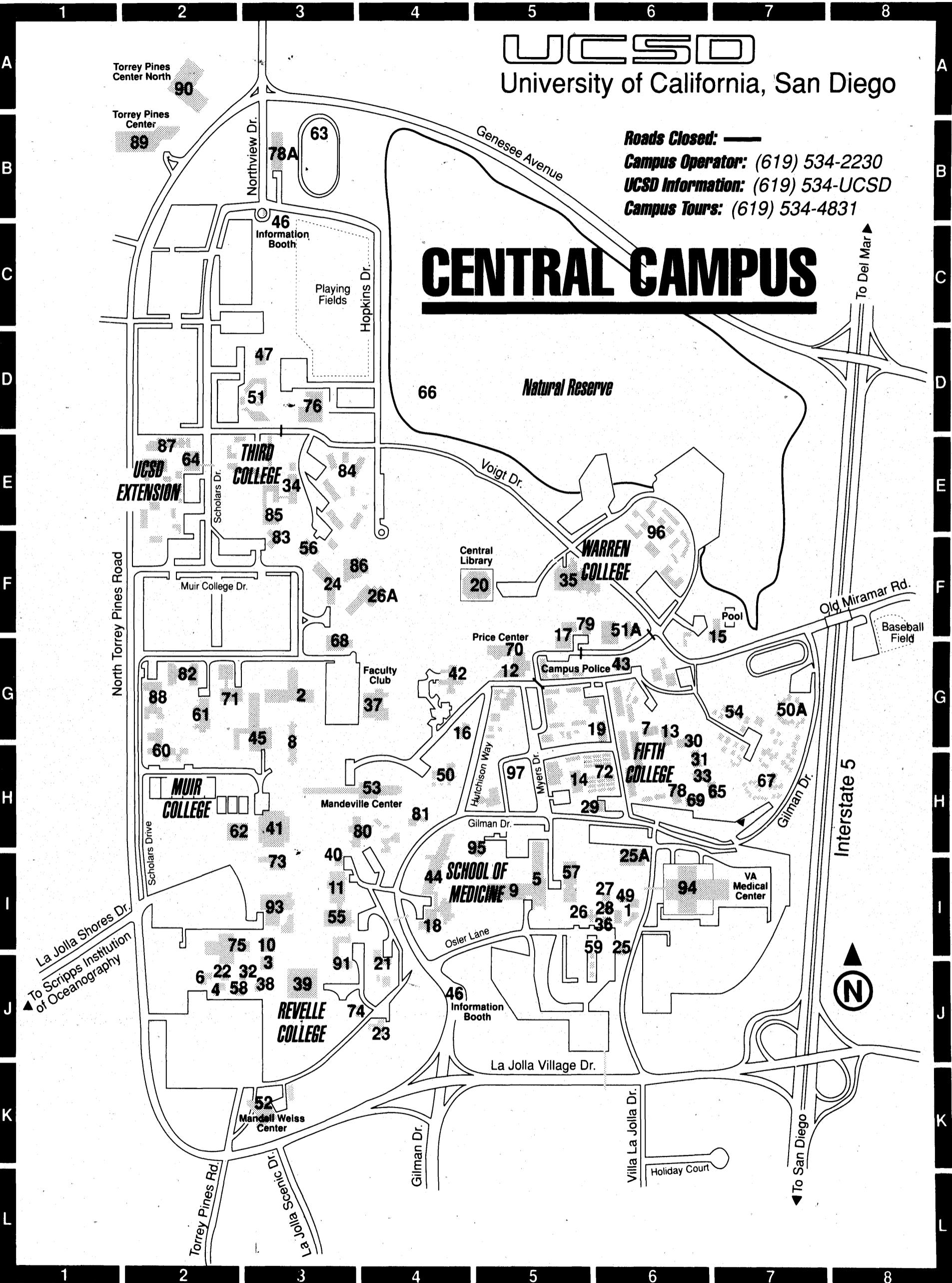
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