

University of California, San Diego

1980-81
**GENERAL
CATALOG**



Correspondence Directory

Admissions

Undergraduate
Graduate

Registrar & Admissions
(Address the appropriate
department of instruction.)

Building 102, Administrative Complex, Q-021

School of Medicine

Admissions Office

1301 Basic Science Building, M-006

Registration

Registrar & Admissions

Building 102, Administrative Complex, Q-021

Housing

Undergraduate
Married Students
Graduate Apartments
Off-Campus Housing

Housing Administration
Residential Apartment Office
Residential Apartments Office
Office of Housing Services

Building 206, Administrative Complex, Q-041
9258 Regents Road, S-007
9258 Regents Road, S-007
Building B - Student Center, B-009

Residence Status

Registrar & Admissions

Building 102, Administrative Complex, Q-041

**Financial Aids
(Loans & Grants for
Undergraduates and
Graduate Students)**

Student Financial Services

Building 214, Administrative Complex, Q-013

**Scholarships
(For Undergraduates)**

Student Financial Services

Building 214, Administrative Complex, Q-013

Fellowships

Office of Graduate Studies
and Research

Building 103, Administrative Complex, Q-003

**Teaching and
Research Assistantships**

(Address the appropriate
department of instruction.)

Employment

Student Employment Office

Building 210, Administrative Complex, Q-013

Student Activities

Student Center

Revelle Campus, B-023

**Foreign Students'
Affairs**

Office of International
Education

International Center, Q-018

**Educational Opportunity
Program (EOP)**

Student Center

Revelle Campus, B-030

**Graduate Advancement
Program**

Office of Graduate Studies
and Research

Building 103, Administrative Complex, Q-003

**Graduate Women's
Program**

Office of Graduate Studies
and Research

Building 103, Administrative Complex, Q-003

Provosts

John Muir College
Revelle College
Third College
Warren College

H&SS Building
Revelle Provost Building
Building 412
Building 302

Muir Campus, C-006
Revelle Campus, B-021
Warren Campus, Q-015
Warren Campus, Q-022

**Dean of Graduate
Studies**

Office of Graduate Studies
and Research

Building 103, Administrative Complex, Q-003

General Information

Public Information Office

Building 407, Warren College, Q-036

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**University of California,
San Diego**



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UNIVERSITY OF CALIFORNIA, SAN DIEGO

ACADEMIC AND ADMINISTRATIVE CALENDAR

1980-81

FALL QUARTER 1980

Fall Quarter begins	Monday, Sept. 15
Instruction begins	Monday, Sept. 22
Thanksgiving Holiday	Thursday and Friday, Nov. 27-28
Instruction ends	Saturday, Nov. 29
Free Day	Monday, Dec. 1
Final Exams	Tuesday, Dec. 2 – Saturday, Dec. 6
Fall Quarter ends	Saturday, Dec. 6
Christmas Holidays	Thursday, Dec. 25 – Friday, Dec. 26
New Year's Holidays	Thursday, Jan. 1 – Friday, Jan. 2

WINTER QUARTER 1981

Winter Quarter begins	Monday, Jan. 5
Instruction begins	Monday, Jan. 5
Academic and Administrative Holiday	Monday, Feb. 16
Instruction ends	Saturday, Mar. 14
Free Day	Monday, Mar. 16
Final Exams	Tuesday, Mar. 17 – Saturday, Mar. 21
Winter Quarter ends	Saturday, Mar. 21
Administrative Holiday	Monday, Mar. 23

SPRING QUARTER 1981

Spring Quarter begins	Thursday, Mar. 26
Instruction begins	Monday, Mar. 30
Memorial Day Holiday	Monday, May 25
Instruction ends	Saturday, June 6
Free Day	Monday, June 8
Final Exams	Tuesday, June 9 – Saturday, June 13
Spring Quarter ends	Saturday, June 13
Independence Day Holiday	Friday, July 3
Labor Day Holiday	Monday, Sept. 7



Undergraduate Admission Information and Enrollment Deadlines

	FALL QUARTER 1980	WINTER QUARTER 1981	SPRING QUARTER 1981
UNDERGRADUATE STUDENTS: ADMISSION Opening date for filing application materials	Nov. 1, '79	July 1, '80	Oct. 1, '80
UNDERGRADUATE STUDENTS: PRIORITY DEADLINE FOR APPLICATIONS FOR SCHOLARSHIPS	Feb. 11		
UNDERGRADUATE STUDENTS: DEADLINE FOR ENROLLMENT AND FEE PAYMENT CONTINUING STUDENTS: Deadline for early enrollment without \$10 late filing fee	May 23	Nov. 14	Feb. 27
NEW STUDENTS: Enrollment through these dates	Sept. 23	Jan. 6	Mar. 31
CONTINUING STUDENTS: Deadline for registration fee payments	Sept. 12	Dec. 19	Mar. 20
NEW STUDENTS: Deadline for registration fee payments	Sept. 23	Jan. 6	Mar. 31
QUARTER BEGINS	Sept. 15	Jan. 5	Mar. 26
INSTRUCTION BEGINS	SEPT. 22	JAN. 5	MAR. 30
ALL STUDENTS: LATE REGISTRATION PERIOD All students pay \$25 late fee. Special permission required to register after this date.	Sept. 24 through Oct. 3	Jan. 7 through Jan. 16	Apr. 1 through Apr. 10
UNDERGRADUATE STUDENTS: DEADLINE FOR CHANGE OF PROGRAM Adding Courses	Oct. 3	Jan. 16	Apr. 10
Dropping courses without late fee	Oct. 3	Jan. 16	Apr. 10
Changing to or from P/NP	Oct. 3	Jan. 16	Apr. 10
Dropping courses without penalty of "F" grade	Nov. 21*	Mar. 6*	May 29*
INSTRUCTION ENDS	NOV. 29	MAR. 14	JUNE 6
FREE DAY	Dec. 1	Mar. 16	June 8
FINAL EXAMINATIONS	DEC. 2-6	MAR. 17-21	JUNE 9-13
UNDERGRADUATE AND GRADUATE STUDENTS REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 6	Mar. 21	June 13
QUARTER ENDS	Dec. 6	Mar. 21	June 13
COMMENCEMENT			June 14
GRADES DISTRIBUTED TO ALL STUDENTS (APPROXIMATE)	Jan. 5	Apr. 14	July 7 (mailed)

*Subject to approval end of ninth week

Graduate Admission Information and Enrollment Deadlines

	FALL QUARTER 1980	WINTER QUARTER 1981	SPRING QUARTER 1981
GRADUATE STUDENTS: ADMISSION Applicants should check with their prospective departments for deadline dates			
GRADUATE STUDENTS: APPLICATIONS FOR FELLOWSHIPS Deadline date for filing application materials Notice of awards Acceptance of Awards NOTE: Most departments adhere to the above for assistantships also, but many will accept later applications	Jan. 15, '80 Apr. 1 Apr. 15		
GRADUATE STUDENTS: DEADLINES FOR ENROLLMENT AND FEE PAYMENT CONTINUING STUDENTS: Deadline for early enrollment without \$10 late filing fee	May 23	Nov. 14	Feb. 27
NEW STUDENTS: Enrollment through these dates	Sep. 23	Jan. 6	Mar. 31
CONTINUING AND NEW STUDENTS: Deadline for registration fee payments	Sep. 23	Jan. 6	Mar. 31
GRADUATE STUDENTS: APPLICATION FOR INTERCAMPUS EXCHANGE PROGRAM	Aug. 25	Dec. 15	Mar. 5
GRADUATE STUDENTS: FILING APPROVED LEAVE OF ABSENCE	Sep. 2	Dec. 22	Mar. 12
SCHOOL OF MEDICINE STUDENTS DEADLINES (Refer to School of Medicine announcement for deadlines)			
QUARTER BEGINS	Sep. 15	Jan. 5	Mar. 26
INSTRUCTION BEGINS	SEP. 22	JAN. 5	MAR. 30
ALL STUDENTS: LATE REGISTRATION PERIOD All students pay \$25 late fee. Special permission required to register after this date.	Sep. 24 through Oct. 3	Jan. 7 through Jan. 16	Apr. 1 through Apr. 10

	FALL QUARTER 1980	WINTER QUARTER 1981	SPRING QUARTER 1981
GRADUATE STUDENTS: DEADLINE FOR CHANGE OF PROGRAM Adding or dropping courses without \$3 penalty	Oct. 3	Jan. 16	Apr. 10
GRADUATE STUDENTS: MASTER'S DEGREE Filing for advancement to candidacy Filing approved thesis	Oct. 3 Dec. 5	Jan. 16 Mar. 20	Apr. 10 June 12
GRADUATE STUDENTS: DOCTOR OF PHILOSOPHY DEGREE Filing for advancement to candidacy Filing draft dissertation with doctoral committee Filing approved dissertation and related materials	Oct. 3 Nov. 8 Dec. 5	Jan. 16 Feb. 21 Mar. 20	Apr. 10 May 16 June 12
GRADUATE RECORD EXAMINATION (GRE) TEST DATES	Oct. 18 Dec. 13	Feb. 7	Apr. 25 June 13 (Aptitude Only)
GRADUATE SCHOOL FOREIGN LANGUAGE TEST (GSFLT)	Oct. 18	Feb. 14	Apr. 11 June 20
INSTRUCTION ENDS	NOV. 29	MAR. 14	JUNE 6
FREE DAY	Dec. 1	Mar. 16	June 8
FINAL EXAMINATIONS	DEC. 2-6	MAR. 17-21	JUNE 9-13
GRADUATE STUDENTS REMOVING INCOMPLETE GRADES (I) ASSIGNED IN PRIOR QUARTER	Dec. 6	Mar. 21	June 13
QUARTER ENDS	Dec. 6	Mar. 21	June 13
COMMENCEMENT			June 14
GRADUATE STUDENTS: COMPLETION OF REQUIREMENTS Final date for completion of all requirements for degrees to be awarded at end of quarter	Dec. 5	Mar. 20	June 12
GRADES DISTRIBUTED TO ALL STUDENTS (APPROXIMATE)	Jan. 5	Apr. 14	July 7 (mailed)



PREVIEW

EXPLORERS WELCOME

Your experience at UC San Diego will be largely what you choose to make of it. If you are genuinely interested in stretching your mind, and in acquiring knowledge and skills that will serve you well for the rest of your life, the University of California, San Diego could be the right choice for you.

If you still don't know where you are headed, or what you want to do with your life, UC San Diego might be able to help you find your way.

But if you are considering UC San Diego solely because someone else wants you to come here, or as a place to hibernate, we suggest you forget us. Because at UC San Diego, all of us are really serious about education.

Not that we aren't equally serious about enjoying ourselves in the process of learning — college years can be and should be years of adventure and happiness. These are the years for exploring, for unfolding, for living with other explorers, who like yourself, are searching for answers to certain very fundamental questions.

UC San Diego can be a very good place to make this search, and that's why most of our students come here. Very few undergraduate students truly know where they are going or what they want to do a

decade from now. If you feel confused about the future bear in mind that

- a third or more of all high school students graduating this year will eventually find occupations in fields that haven't been invented yet;
- the average American worker changes occupation five times during a working career.

UC San Diego welcomes explorers.

UC SAN DIEGO IS SPECIAL

So what makes UC San Diego unique? For one thing, this is an exciting place. It's intellectually stimulating to study with men and women who are making headlines in the arts, sciences, humanities, medicine, and oceanography. It's an inspiring experience to share a campus with a Nobel prizewinner who foresees the day when people may sail to distant planets by riding their spacecraft on the solar wind.

One reason for choosing UC San Diego, then, is its faculty.

THE COLLEGES OF UC SAN DIEGO

A second feature which makes UC San Diego a "special" place is

its structure, consisting of four semiautonomous undergraduate colleges: Revelle, which opened in 1964; Muir, which opened in 1967; Third, which opened in 1970; and Warren, which opened in 1974.

For some time now, educators around the country have been searching for an alternative to the "megaversity" syndrome. To bring first-rank scholars together for teaching the young and one another, it is necessary that a modern-day university be "big" — at least big enough to afford well-equipped instructional and research facilities, laboratories, and libraries. Yet "bigness" may result for some students in a loss of a sense of individual worth, in loneliness in the crowd, and at times in outright alienation. The college system at UC San Diego offers a structure intended to combine the best of a large university with the advantages of a small, liberal arts institution. The four colleges offer different educational philosophies and separate campuses and living arrangements. Each has a personality and life-style of its own. And each, through its staff, faculty, and student body, strives to give students a sense of belonging to a community.

A most important aspect of our collegiate system is its

encouragement of diversity among educational philosophies. We believe that as long as students have varied interests and goals and differing personalities, there can be no such thing as one optimal educational philosophy for all. It is only natural that faculty members who hold similar views should wish to band together to form their own college and determine their own ideal curriculum. As a consequence, students are able to choose that college which best fits their individual styles and preferences. The four colleges at UC San Diego have markedly different educational philosophies and traditions. While each is a comprehensive, four-year college offering its students the full range of courses and majors available at UC San Diego, each has a distinct set of graduation requirements and its own affiliated faculty and administration. As views change in any learning process, a student may wish to transfer from one UC San Diego college to another and can do so without having to face the hardships that accompany transferring to another university.

The UC San Diego college system is not static. Like all human processes, it is dynamic; it grows and changes. Over the years, enriched by experience and new generations of students and faculty, UC San Diego's structure has evolved, and it continues to do so. We, the faculty and students of UC San Diego, continue to learn from experience and to refine our college system. We explore.

RECREATION AT UC SAN DIEGO

UC San Diego's undergraduate colleges are situated on a 1200-acre site high on the bluffs overlooking the Pacific Ocean at La Jolla. This seaside community has long been famed as a vacation and retirement colony. It has some of the finest beaches and coves, restaurants, art galleries, and other

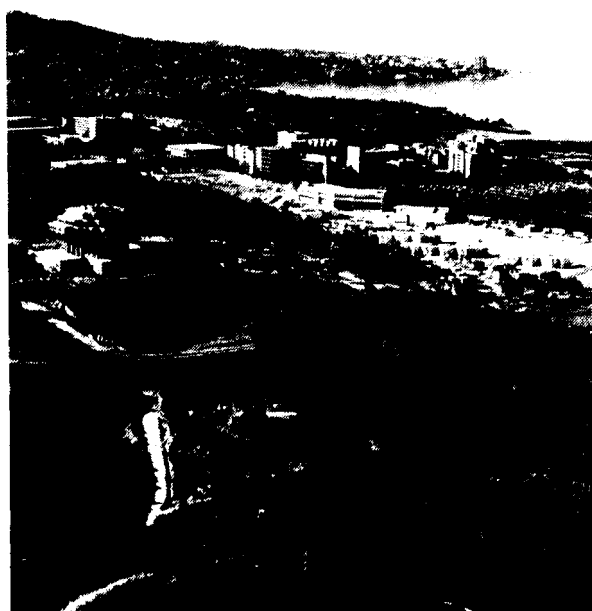
recreational and cultural attractions in the nation.

Naturally then, much of the social life at UC San Diego centers around the waterfront, with surfing and scuba diving among the favorite diversions of students here.

Inland, student life ranges from the small-town atmosphere of Del Mar southward to the open-air markets of Tijuana and the primitive wilderness of the Baja California peninsula in Mexico.

The city of San Diego, some twelve miles from the campus, offers a variety of recreational opportunities including Old Town (where California was born), Sea World in Mission Bay, the world-famed San Diego Zoo, and the Sports Arena and San Diego Stadium, sites of a year-round calendar of major league sporting events and concerts.

For theater-lovers there's Balboa Park's Old Globe, home of the National Shakespeare Festival every summer. Next door to the Old Globe, the Cassius Carter Centre Stage Theater presents a season of plays, while downtown the Civic Theater also schedules a full season of cultural events including opera, ballet, and the San Diego Symphony.



On-campus entertainment includes a series of Friday and Saturday night films at very low prices throughout the year. The Department of Drama presents plays throughout the school year in

the UCSD Theatre. Concerts ranging from rock to jazz to classical, free dances in the cafeterias and gym, street dances, noon concerts and appearances by prominent jazz and rock groups are also scheduled regularly.

Informal meeting places such as Muir's Five-and-Dime are visited by students throughout the day and evening. The Student Center provides many meeting rooms and recreational facilities for students. The Mandeville Center, a \$5.3 million fine arts building, houses offices, classrooms, and work spaces for the Departments of Music and Visual Arts, as well as an 850-seat auditorium. The three-level structure provides a center for art exhibits, concerts, and other cultural events.

MOUNTAINS, DESERTS AND BEACHES

Many Southern Californians live out-of-doors. The San Diego metropolitan area — which includes UC San Diego — has the most benign climate in the United States, year-round.

Fishing opportunities are plentiful offshore in kelp beds west of La Jolla, and surrounding the Coronado Islands in the Mexican waters. Bass and trout fishing are found in nearby lakes and streams. 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 in the spring.

For 900 miles southward from the U.S.-Mexican border stretches the peninsula of Baja California, a mecca for lovers of unspoiled beaches and untouched mountains and deserts. The peninsula, site of the grueling Baja cross-country road races each year, is still largely unexplored wilderness, despite the recent opening of a trans-peninsular highway.

MOST SPORTS-MINDED CAMPUS

UC San Diego Physical Education Department Chairman Dr. Howard Hunt calls this campus "the most sports-minded in America." And Dr. Hunt has the statistics to prove it. UC San Diego fields more intercollegiate athletic teams — thirty-one — than any other college or university in the nation. This total is all the more remarkable in light of the fact that UC San Diego has no big-time football team and that the student body voted four to one against allowing any athletic scholarships.



The university's amateur sports program has produced some championship teams. In one recent year, for example, UC San Diego's Tritons were national volleyball champions, and the team included two All-Americans. Local and regional championships have been common to other teams as well.

The same athletic philosophy governs men's and women's athletics. Athletes of both sexes share successfully in the use of facilities, equipment, and financial resources. Although students may be of varying interests and abilities,

all derive benefits from participating with other athletes, receiving instruction from qualified coaches and striving for excellence.

PLANNING YOUR CAREER

The choice of a major can be part of your career planning. But your choice will not necessarily lock you in for life to any specific type of work. A major in biology, for example, can provide certain laboratory skills, or preprofessional training for a health field, or lead to jobs quite unrelated to biology.

A firm commitment to a particular field is not expected. However, by graduation, in your own best interests, you should know where you want to begin, and have a direction in mind.

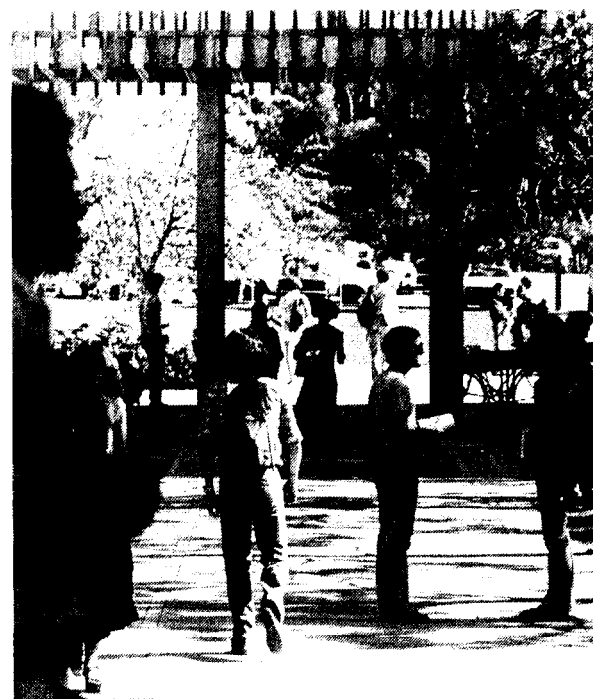
There are career-planning services to help you in this process. Counseling, occupational literature, employer information, and data on employment trends are all available. These services, together with your own experience, probably will lead you to a satisfying initial choice.

SELECTING YOUR MAJOR

Your major course of study at UC San Diego will be determined by a number of things, including your interests, skills, abilities, and needs.

Should you need help in selecting a major, there are many people standing by to aid you. Among them are the academic advisers in the provosts' offices, faculty members (who can help you to select a curriculum that is right for you), and a staff of specialists in Counseling and Psychological Services (who can help you appraise your needs).

With or without such help, you will probably select a major by your second year at UC San Diego, and perhaps will change it as your education progresses.



WHAT WE DON'T HAVE

As you will see from the list of majors shown in this catalog, UC San Diego offers a variety of programs in the humanities, fine arts, social sciences, and natural sciences. We must admit, however, that there are some programs not offered here. Further, although every academic program has met all the rigorous standards set by systemwide faculty and administrators, there are certain emphases in some majors which may not be what you are looking for. In some cases, our not offering a particular program or activity reflects a deliberately chosen philosophy; in others, the lack is temporary, to be liquidated as we grow; and in still others it is due to a reluctance to duplicate offerings at other UC campuses or in other segments of higher education.

So when you come to UC San Diego, don't expect to find:

An intercollegiate football team;

Athletic scholarships;

Physical Education as a major or minor;

Business courses (although we do offer a management science major, through the Department of Economics);

Oceanography as an undergraduate major (although we can prepare you for graduate work in that field);

Nursing (although we can give you the first two years leading to qualifying for the Schools of Nursing at UCLA and UC San Francisco, as well as other institutions);

Dentistry (although our various B.A. programs in the sciences make excellent pre-dental programs);

Industrial Arts;

Secondary Teaching Credentials (although at UC San Diego you can complete the first four years of the five required by the State of California);

Journalism (although many of our majors will qualify you to work as a journalist);

Geography;

Early Childhood Education.



Some departmental emphases of which you should be aware:

Our biology programs are strongly oriented toward the cellular and molecular levels of life. While we offer courses in organismal and field biology, there are no majors with this sort of emphasis.

Our Department of Visual Arts offers excellent programs in fine arts studio work and in art history — but you won't find illustration or fashion design or similar commercially applicable programs.

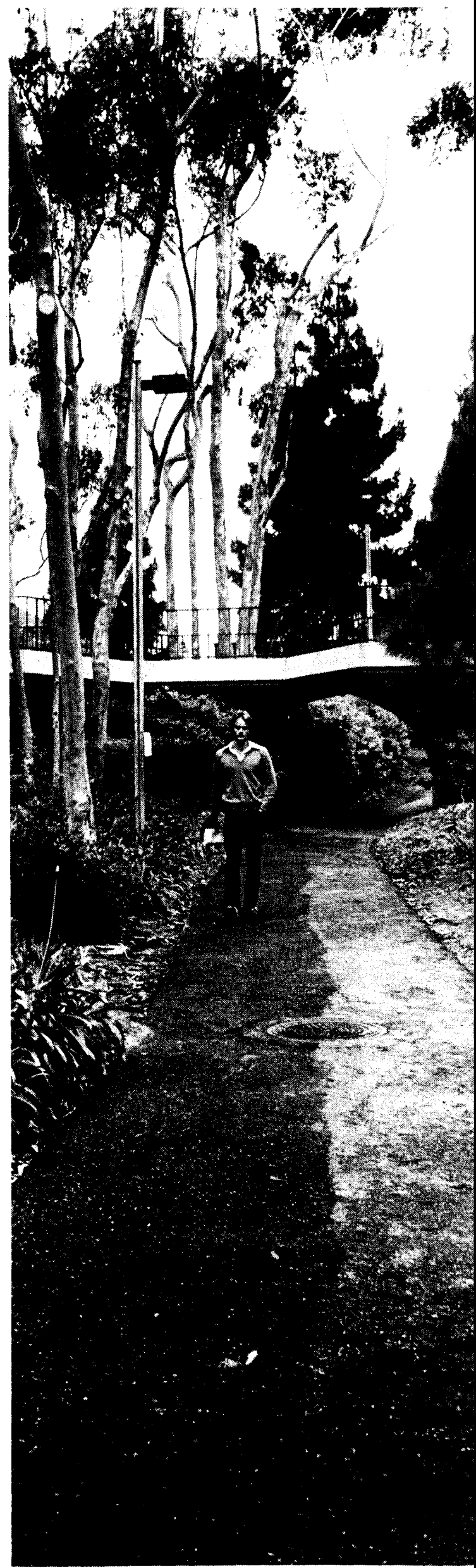
Our Department of Psychology offers an emphasis in experimental psychology, with choices of experimental approaches. We also offer a general psychology major, but nothing in the fields of humanistic psychology or clinical psychology.

Our Teacher Education Program leads to the partial credential in elementary teaching; graduates of this program are qualified for teaching jobs, with the understanding that the full credential is to be obtained within seven years, which will involve taking courses at some other college or university after the completion of the TEP here.

NEED MORE INFORMATION? CHECK THE FOLLOWING:

- How do I apply for admission? Page 80. (see also "Note," below.)
- How much does it cost? See "Fees and Expenses." Page 93.
- How does UC San Diego grade? Page 100.
- What about scholastic requirements? Page 103.
- How do I go about choosing a college at UC San Diego? Page 47.
- What kind of services and facilities are available at UC San Diego for students? Page 130.
- How many students and faculty were there at UC San Diego in 1979/80? See Appendix.
- Where do I write for more information? See inside front cover.

NOTE: An admissions packet for students interested in entering UC San Diego is available at any California high school or junior college counselor's office. Out-of-state students may obtain a packet by writing to the Office of Admissions on any University of California campus.



History of the University

The University of California was established in 1868. Initially located in Oakland, it moved to its first campus, Berkeley, in 1873. Today, along with the Berkeley campus, the University has campuses at San Diego, Irvine, Los Angeles, Riverside, Santa Barbara, Santa Cruz, Davis, and San Francisco.

Instruction on these campuses covers all of the broad and essential areas of human knowledge, including the arts, sciences, and literature. Each campus has its own organization, objectives, and style of academic life. Each offers a unique set of programs and facilities.

The university is governed by a board of regents. The regents appoint the president of the university, who is the executive head of the university, and, with the advice of the president, appoint the chancellors, directors, and deans who administer the affairs of the individual campuses and divisions of the university.

The University of California, San Diego is situated adjacent to the

community of La Jolla near the northern limits of the city of San Diego. The San Diego campus traces its origins to the closing years of the nineteenth century when Berkeley zoologists selected La Jolla as the site for a marine station. This project, which eventually was named the Scripps Institution of Oceanography, became a part of the University of California in 1912. When in the late 1950s the regents decided to establish a general campus of the university at San Diego, the Scripps Institution — with its small though distinguished staff of scientists — formed the nucleus of the new institution.

At first, only graduate studies and degrees in the physical and natural sciences were offered. In the fall of 1964 the campus accepted its first undergraduates, offering a basic lower-division curriculum to prepare students for majors in the humanities, social sciences, biological sciences, physical sciences, and mathematics.

Occupying more than 1200

acres, the UC San Diego campus spreads from the seashore at the northern edge of La Jolla, where the Scripps Institution is located, across a large portion of the adjacent Torrey Pines Mesa, high on bluffs overlooking the Pacific Ocean. Much of the land is covered with groves of eucalyptus, grown from seed brought from Australia.

The Master Plan for UC San Diego calls for establishment of a series of interrelated colleges on the bluff site. Each college will be designed to accommodate approximately 2300 students. Together, the various colleges will offer a wide variety of undergraduate and graduate programs. The objective is to give students and faculty the opportunity of working together in small academic units while, at the same time, enjoying the advantages of a major university. Four colleges — Revelle, John Muir, Third, and Earl Warren — are in operation.

UC San Diego is accredited by The Western Association of Schools and Colleges.

It is important to understand that the university experience is both social and intellectual; time spent getting to know other students, faculty, and staff undoubtedly enhances the learning process. In the following conversations, members of the UC San Diego community discuss their diverse backgrounds, differing approaches to their university pursuits, and assorted academic and social concerns. The broad range of comments and reflections offer a head start in coming to view university life at UC San Diego as an interesting, important, and lasting adventure.



INTERVIEW

Don Cotter

Sophomore
Warren College

Q: How did you happen to pick UC San Diego?

A: I was in my junior year of high school when I started looking for colleges that I could afford and which had a good reputation. Since I was a California resident, all the state, and University of California colleges looked good. I researched many and narrowed it down to Berkeley and UC San Diego. I was a computer science major and those two colleges had the best programs, both in computer science and in overall academic approaches. Since I lived nine blocks from the Berkeley campus, I decided to come here.

Q: Why did you choose Warren College?

A: Before entering college you read about the different philosophies of each of the four colleges. Since I had decided to be a computer science major I didn't really see the necessity of the Revelle curriculum, which gives you a little bit of everything and an idea of what you might like to do. Since Warren is a college where you step immediately into what you want to do, I chose it.

Q: Along with your major you have two minors. What are they, and how do you plan to combine these studies once you leave school?

A: My minors are business and literature. After I leave school I don't want to just program computers. I'd like to get out into the business world and become an expert in some company. Now, everybody who runs a company could use an in-house computer.

Q: There's no business school here. Has that been a problem?

A: I must admit that it hurts. The closest thing at UC San Diego is management science. I do hear the business major is being developed though, which is a really good sign. It's definitely needed.

Q: Has UC San Diego lived up to what you thought it was going to be when you came here?

A: For me it has lived up really well. I've tried to go out and make a point of participating in the intramural program, for example. If you wait for the intramural program to grab you, you'll never get into it. I'm also in the student government, and this year as a sophomore I'm a resident adviser. I try to make the university work for me. If someone does that, I don't see how he or she can fail.

Q: What sort of sports do you play?

A: I usually play three or four intramural sports: basketball, softball, and water polo. That's how I've gotten to know people. Some people can get isolated here, but through that particular outlet I found you can meet a lot of people. Next quarter I'm also starting something I've yet to take advantage of: the Mission Bay aquatic center, where I'm going to take a sailing class. But the resident adviser's position now keeps me busy outside of academics.

Q: What do you think was the biggest adjustment for you when you came to college?

A: There was one adjustment that I



"We go to classes on Revelle, Muir, and Third, but nobody has classes here at Warren so we are somewhat set apart. This is nice because you can go to classes and then come home."

had to make. I had gone to an all-male high school. Yet in high school I was senior class president and we had a sister school, which meant I developed many kinds of relations. But for some people I can see that that would be a real sharp awakening. There is also some academic shock when you come to the university. Classes here are so much tougher than in high school. I got spoiled in high school. I was always able to breeze my way through. But when you get here and you don't study, you'll find out that it's not going to work. So after the initial jolt, you have to change your style a little, hit the library more often.

Q: Was it a jolt living away from home or encountering a large, impersonal place such as a university?

A: In our particular dorm situation the impersonal aspect of the university disappears. The fact that you can't always talk to professors, and you feel lost, and sometimes like a number, is easier to deal with when you know that little family unit is back at the dorm.

Q: What about the social life here? The big complaint is that there is nothing to do.

A: If you just wait for the social life to grab you, you'll probably end up bored your entire four years here at UC San Diego. There are plenty of things to do. Being a freshman, it's tough because you don't know how to attack it. But there are parties on campus. Outside campus it's a little hard because we're sitting up on a hill here, and I don't have a car, which is a drawback. But with all the activities on campus I never have a free weekend anymore.

Q: At UC San Diego they downplay athletics and that kind of tradition. How do you feel about not having a football team to go root for? Or do you care?

A: I miss that a lot. During high school I went to all the football games. I enjoyed that kind of spirit. That's definitely lacking here. I can't say it's because we're so highly academic. Because Berkeley is highly academic and the students have that kind of release. We do make up for some of what we lose in

the intramural program, though. But I think that it's a shame that we don't have the money to give to our intercollegiate teams.

Q: Is there much of a sense of community among the various colleges?

A: We go to classes on Revelle, Muir, and Third. But nobody has classes here at Warren so we are somewhat set apart. This is nice because you can go to classes and then come home. There is a sense of your own personal pride for being a Warren student as opposed to being a Revelle student. There are different philosophies and different ideas.

Q: What kind of advice would you give people who are thinking about coming here?

A: I would suggest that they look at this school very carefully. A lot of people come here because they know it's in San Diego and they think, "... surfing and fun in the sun." They don't realize that there are high academic standards here. There is a lot down here to offer, but you have to be serious about your studies, also.

Jimmie Lee Brown, Jr.

Senior
Third College

Q: What lead you to apply to UC San Diego?

A: I applied during my senior year in 1974-75 to two places: UC Davis and UC San Diego. It just so happened that UC San Diego accepted me first. I originally intended to go to Muir College but when they sent back my application they asked if I'd mind going to Third. I figured any chance to go to college was to be welcomed, so I said yes.

I came down when I was a senior in high school and was very impressed. At the time, Third College had not really been built, and they had not built the new Mesa apartments. Everything was still under construction. What impressed me most, since I came down in the spring, was the clear air and seeing the blue ocean from the field at Muir. Everything looked nice, and the people I met were also very nice. They must have known I was new; they asked me what I'd like to know about the school. And I said, "What kind of people do you have here? What kind of curriculum do you have to

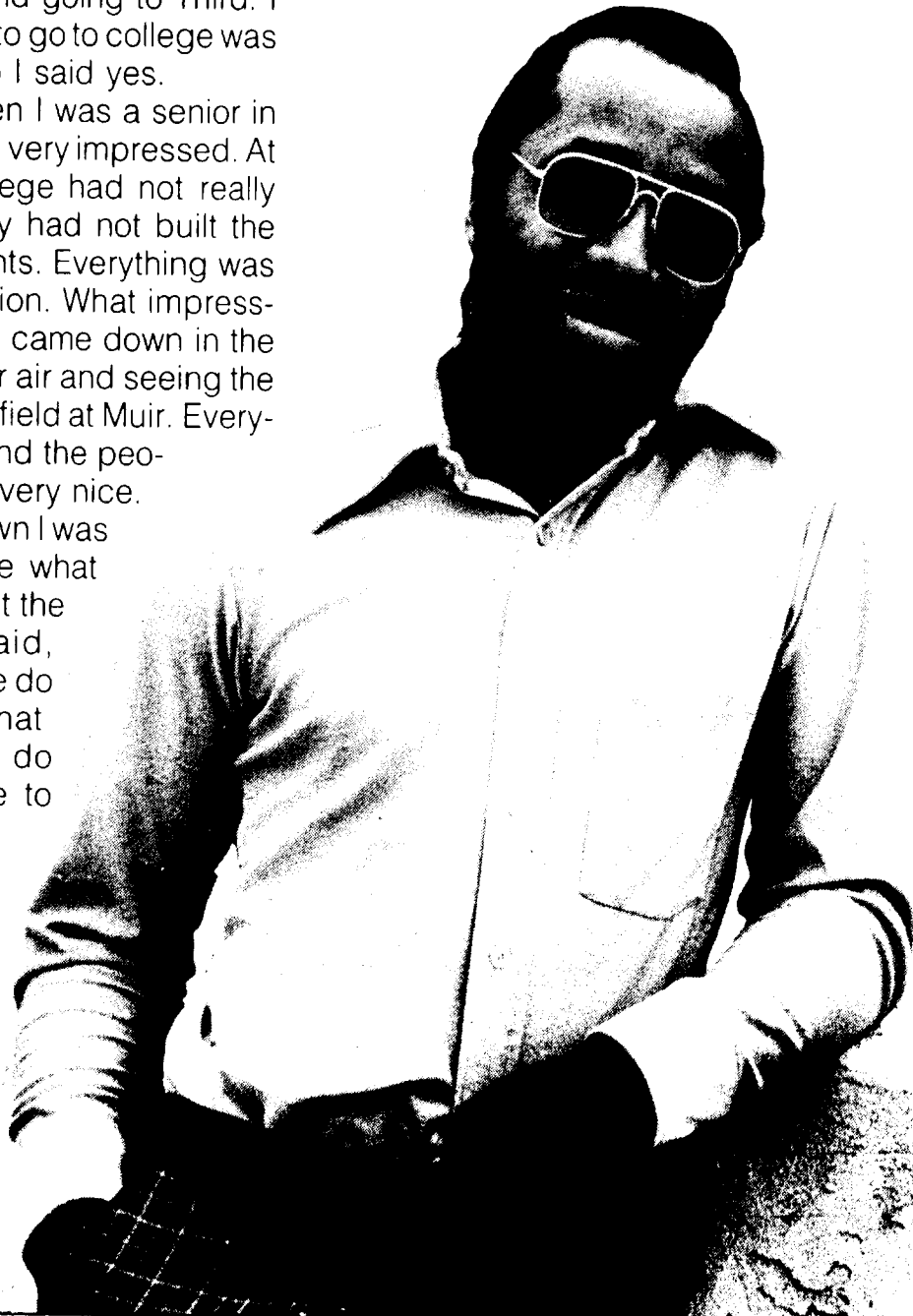
offer? What do students do here for fun?" These were people I had just met walking around, and they gave me all kinds of information. After subsequent visits I became totally convinced that UC San Diego was probably a good place to go.

Q: Now that you're a senior and have been here for five years, how do you think it has measured up? What's your impression now?

A: I'm a little worried about making this statement, but I guess I should make it anyway. I was unhappy with the major I had chosen, sociology. I wanted to go into law, to work with juveniles. The only program or college that offered such internships would have been Warren, then Fourth. But at the time I was asking about it, Warren was still basically new, and the internships not yet available. I think I was lucky though, in terms of going to Third College, because I became very involved in the governmental structure of the college. Even though I did not get the juvenile study input that I really wanted, I got a good idea of how politics operate on many levels.

Q: What sorts of things were you involved with at Third College?

A: I was working on recruitment and became involved in the running of the college. I was mostly involved with guarding against obvious injustices that would show up: among them, programs such as Third World Studies and Communications which are targets for cuts. Jarvis I and maybe Jarvis II threaten what I think are programs the university needs in a cultural sense.



"When I came here I was a hot-head and a radical. I've probably not ceased being a radical, but have learned how to direct my anxieties, my tensions. I know how to place them, word them, and possibly help many more people than I would have previously."

Q: What about your own sense of the campus as a whole? Do you feel after five years here that you're comfortable, or do you feel like an outsider? How has the experience been?

A: As a senior, I think it's time for me to go, but I'm going to miss the university. I may be facing fears about graduating, because school offers me a routine: I know that every three months something is going to happen. After summer, I'll be in school again. At Third College specifically, I'll miss the dean. In general, though, I'm not sure that people at the university have really made a conscious effort to rise above their own competitive attitude. Finding a student who will help you is hard.

Q: What do you think you've gained in five years of college?

A: One thing I've learned from dealing with problems here is to discuss the basics and the heart-and-soul of issues. The university has also helped open my eyes to a lot of policy, the infringements on people's rights. It has also opened my eyes to a lot of the nice things in life: I was really not into classics when I came here, now I am. I was really not into jazz when I came to college, now I am. It has been enlightening, culturally. I would also say it has helped me to become a better adult. When I came here I was a hot-head and a radical. I've probably not ceased being a radical, but have learned really how to direct my anxieties, my tensions. I know how to place them, word them, and possibly help many more people than I would have previously.

Q: What would you say was your toughest adjustment to college?

A: I can still clearly remember the day I first arrived. My mother and I left San Bernardino at six o'clock in the morning, and arrived at eight o'clock at the new Mesa apartments here. I was very nervous because I did not know who my roommates were going to be, since they came later. When I walked in I really felt alone. But by the end of my first week I had about five really good friends with whom I've associated ever since. And since then everything has moved well. The biggest academic problem I had was when I really found out what type of institution I had come to. When I was a freshman, I took a class with Dr. Saltman. His first statement was that the room was over-crowded and that fewer people should take the class. I stayed, and we had an exam that Friday. When the test was over people were leaving and crying and carrying on and I knew then that I was in a rough place. And if I was going to make it, I was going to have to be prepared on every level.

Q: Did you think it was going to be this tough when you came here?

A: Well, I really did not know what to expect when I came here. It was difficult as I look back on it now, but not as difficult as I thought it was going to be. But at first it definitely caused me some tears. At twelve o'clock at night it definitely caused me some tears.

Q: What about being a minority student on campus? How do you find that you fit in? Would you advise other minority students to come here?

A: I came from an all-white high

school so coming here and seeing a lot of whites didn't bother me. But I did find a feeling of racial hostility here. I have not really encountered it that much on the West Coast, but I met a few students at my college, Third, and at Muir, Revelle, and Warren that were really negative. People showed a great deal of open racial hostility, which I could not understand. But I must also mention that among the four colleges there are a great number of friendly and very warm people, too. I specifically speak of Revelle because I've met many, many good people at Revelle.

Q: What would you say to other minority students about UC San Diego?

A: That when they come they should try to succeed. They must succeed. If you can't push yourself to succeed here, who's going to assist you when you're out there in the field? Who's going to help you live? Nobody. I personally don't want a doctor who can't motivate himself or herself to do a great job on my intestines. I definitely don't want a lawyer who can't motivate himself or herself to take care of my case. I don't want an architect who can't motivate himself or herself to design the best building. This motivation also relates to people as a whole. I'm just saying that people should have a degree of dedication.

Q: What about your own future? Do you know what you want to do?

A: I applied to Iowa, to law school, because I eventually want to work with juveniles. I'm not going to stay away from school: I want to make sure I maintain my study skills.

Judy Preston

Sophomore
Warren College

Q: What brought you to UC San Diego from Indiana?

A: As a military dependent I was able to travel in a number of areas. I had been in California three years ago, and looked at the university system and determined that California would be my state of residence as an adult. At that time I had an associate degree in nursing. I'm interested in professional training and graduate work. The reputation that UC San Diego has of promoting their undergraduates to go to graduate school was one of the primary things that enticed me here.

Q: How do you find it being a student who is older than most of the other undergraduates here?

A: Older than most of the other graduate students! I find that it has been good for me because the administrative personnel have been responsive to me, the professors have been responsive to me. I think that one of the reasons is that I take it upon myself to make my needs known to those people. I don't think that the professors, the teaching assistants, or the administrative people will consciously let a need go uncared for.

Q: Do you think it's easier or harder for a thirty-year-old woman to return to school and be surrounded (for the most part) by people that are twelve years younger than she?

A: I think that it's a difficult process if you dwell on the things that you aren't. I'm not twenty-two years old, and I don't socialize on campus. My idea of a hot Friday night is not going up to Walk's pub or even going over to the beach.

But the campus is nevertheless very definitely a part of my life. I was surprised to find that women who come to UC San Diego are classified as older women if they are twenty-four. So I'm very "older" at thirty. But you have to have a positive attitude about what you're doing. And this is something that I've wanted to do for a long time.

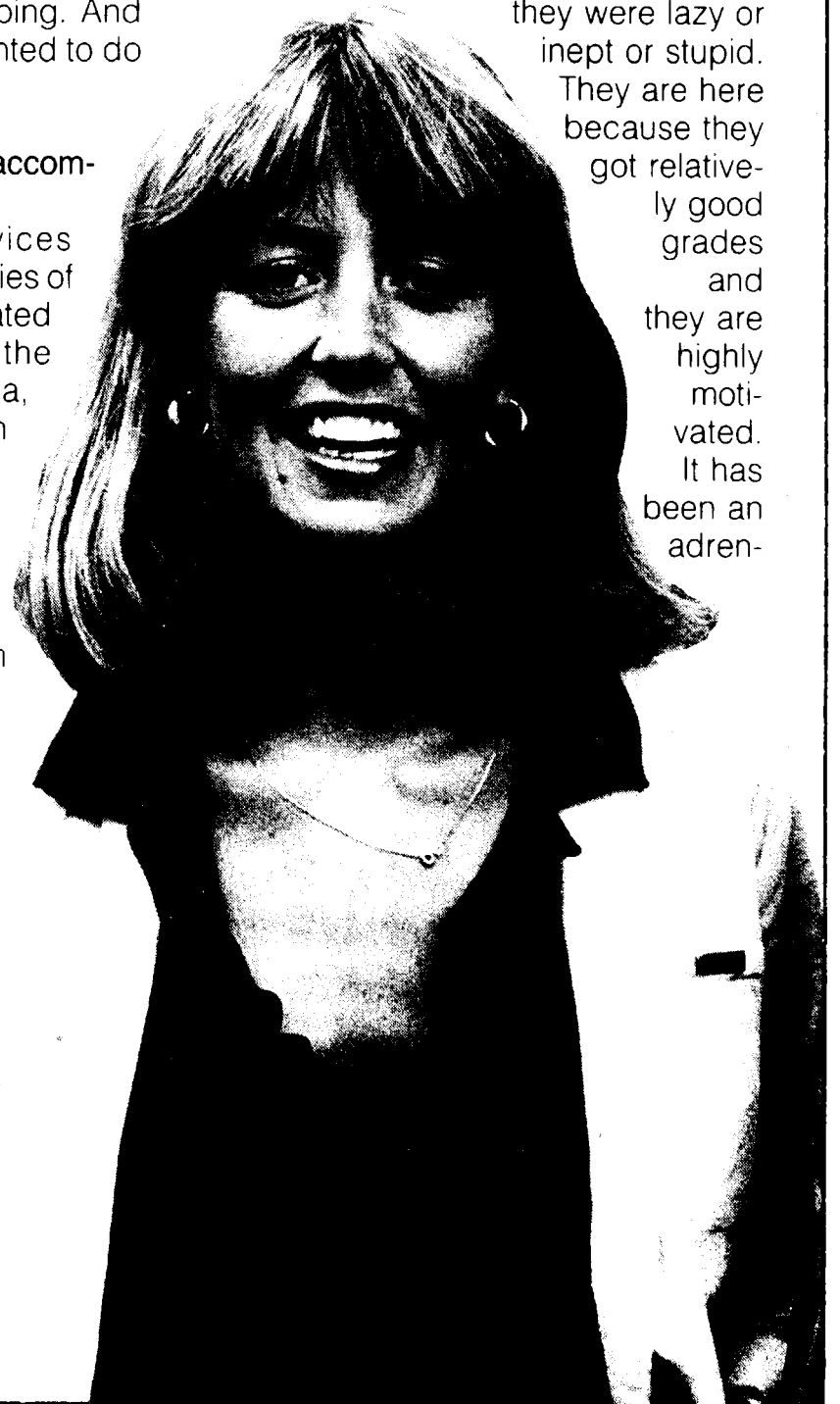
Q: What do you want to accomplish?

A: There's a health services administration program or series of programs that are being initiated now. Health services are the largest industry in California, and the third largest industry in the nation. Somebody has to be able to run part of that. I want to get involved in the administration of health services. Human care services is what I'm interested in. I'm looking at more indirect methods of providing that human care. Whereas nursing is direct care, health services administration is indirect care. I want to participate on a state or national level in health services administration.

Q: Has UC San Diego lived up to

your expectations? If not, how has it not?

A: It has met my expectations of excellence in the classes that I've attended. Even the younger people who are here now didn't get here because they were lazy or inept or stupid. They are here because they got relatively good grades and they are highly motivated. It has been an adren-



aline pump for me to be around people who are in their early twenties who are pushing. The other side of that coin is the question of whether it is reasonable at twenty to program yourself for the next fifty years. I've had a little more time to decide. Still the enthusiasm is there. It's a very enthusiastic group of people. A really intelligent group, too.

Q: Do you find that it's easier to return to school at a later age? You're more self-directed, you know what you want to do . . . you don't fool around as much.

A: My purpose for coming back to school was to get an education. My purpose is not to meet a nice young man so that I'll have a husband. My purpose is not to learn how to socialize with people. At the same time I want to integrate into my life parts of the campus that I never knew before . . . the music that's available, the theatre that's available. I'm doing crew this quarter, so I'm learning a new skill. There's a nice environment here, a very productive environment.

Q: Then you are a full-time student?

A: Yes. I have an academic internship this year. So I'm working twenty-four to thirty hours a week for the Indo-Chinese

resettlement program here. Then in order to eat because the stipend is not sufficient, I also work twenty-four hours a week at University Hospital in the newborn nursery.

"I was surprised to find that women who come to UC San Diego are classified as older women if they are twenty-four. So I'm very 'older' at thirty."

Q: Have you encountered many other students like yourself here?

A: Oh, yes. You know that Warren has the older-student reentry program. The orientation for reentry students at the first of the year is terrific. We spend two days going around the campus, literally like freshmen, even though we had all been on campuses before. I would have been somewhat taken aback, or very sluggish if I hadn't had the orientation program. There were a number of us, but the largest number were women in their early thirties to late forties.

Q: What was the hardest adjustment for you coming back to campus?

A: It's difficult to enter into a discussion with people who are dealing with theory. You meet people that you like who you know are really energetic and enthusiastic, and you'd like to show them the road. If you could make a little map for them of their travels through the next two or three years, or when they go out into whatever world they may be going into, it would be a little easier. You certainly couldn't show them all the dips and bumps, just give them a few guidelines. The difficult thing that I had to learn for myself was just to say, they'll learn.

Q: What advice would you give to people who were thinking of returning to college or starting college beyond the usual years?

A: I would say come back. Definitely. Come back and understand the shortcoming of having been out of school for a long time. But also understand the wisdom and the real-world abilities an individual possesses after having worked and dealt with a realistic situation. I think a lot of the younger students are terribly insulated from what they are actually going to experience as adults, working in an everyday world.

Elsa Leyva

Senior
Third College



Q: How did you happen to choose UC San Diego?

A: I had originally planned to go to UCLA just because I lived in Los Angeles, but after talking to a friend of a friend who was already here, and learning about the college system, I decided to come here. The college system just seemed more personal to me. I was used to big schools; my high school had 3,000 students. I was looking for something a little more personal so I thought UC San Diego would be a good place.

Q: How has it lived up to your expectations or not lived up to your expectations after four years now?

A: Five years now, since I'm on a five-year plan. It has lived up to my expectations in the sense that I have gotten a lot of personal attention, especially from the Third College staff and dean's office. They deal on a very personal level. They've made it easier for me to fit in. And that has been important because when I came, I felt that I didn't fit in.

Q: Why?

A: During high school I lived in East Los Angeles, which is predominately Chicano and Mexican-American. My high school was 98 percent Chicano. I was used to the environment and never really had any contact with other cultures. So when I came here I was on the other side of the fence. And I really didn't feel like I belonged here or knew if I was going to make it. But I found that there were very supportive staff members within the college system. I have also found a lot of friends through

M.E.Ch.A. (Movimiento Estudiantil Chicano de Aztlan) which has been a very supportive organization for me. I found something to keep me here. The program I am in, Urban and Rural Studies, offers courses which I feel I need — something that will not only give me theory but in time will be applicable to my goals: to come to college and better myself, and then go back to work in my community. In several of my class projects I have been working in the community and with the Chicano Federation. So I'm now getting A's in the classes because they have been very good projects; at the same time, I have been lending my services as a student.

Q: Do you feel that other Chicano students should also come here?

A: I feel that it's a very different atmosphere, but I don't feel that Chicano students should stay away because of it. More Chicano students should come to the campus so that the needs of Chicano students and other students at Third College are met. I think that Chicano high school students need to get away from the idea that college is only for the very bright. They need to realize that the university is there for them, too. And that they can make it even though it is hard. I know it was for me, but it still can be done.

Q: What was hard for you?

A: Much of my high school preparation was inadequate. I came to the university and was already behind. In high school I was in an advanced placement English class that was using discarded books from another local high school.

"I think that Chicano high school students need to get away from the idea that college is only for the very bright. They need to realize that the university is there for them, too. And that they can make it even though it is hard."

This was one of the drawbacks which I first experienced, but I have not let this get in my way. I feel that the individual has to be determined to make it, no matter what obstacle is in the way.

Q: Are there opportunities for other cross-cultural experiences here?

A: I had the opportunity through roommates when I first moved on-campus. For two years I had a roommate who was of Jewish background and another who was Anglo-Saxon. But there were clashes, which involved their way of living, their attitudes, and their values. These were all very different from the way I was brought up. Even though I was made aware of other ways of thinking, we could never become that close. My best friendships have always been with other Chicano students on campus, even though I have had very good classroom relationships with black students and other white students. But all students have the opportunity to learn about other cultures if they really want to do it. In my case, the contacts I've made have not been ones I've had to actively pursue.

Q: What about relations with faculty?

A: I have had some good relationships with faculty who make their classes interesting, because it's always easier to talk to professors who don't put up a front, but who encourage class participation both in and out of class. I have had some good experiences

where I have been able to sit down with faculty and talk with them. One professor who is a Chicano, Professor Romo, would often be in the snack bar and I could go and talk about classes and discuss other interests. I have found that interaction with Chicano faculty just makes university life a little more meaningful. It provides an extra push, a feeling that, "... hey, you can make it."

Q: What do you think was the hardest adjustment for you to make coming to college for the first time?

A: I think studying. In my first quarter, I was on academic probation, which really scared me. I wasn't used to studying the way you need to study here. It's just very different. I also had to adjust to the quarter system. I came from a high school where there were semesters, so I could slack off for one or two months because I could always make it up in the last one or two weeks. But here you can't even get sick!

Q: What are your specific plans when you graduate?

A: At this point, I am waiting for responses from some law schools to which I have applied. I hope to use my legal skills to help support the community, whether it's working directly with a client on a one-on-one basis, doing legal aid, or working on issues that need to be resolved.

Q: What kind of advice would you give

a student who was contemplating coming here?

A: They should visit the campus, to see what is offered and to look at the area. Also, a lot of high school students are told by their counselors (at least I was) to go to vocational schools, or to be a secretary or whatever. These students weren't really encouraged to go to college which I think is important. I feel that those students who want to do it should do it, and do whatever they need to do.

Q: What do you think you have derived from your years in college?

A: For one, I have seen myself develop personally. My activities on-campus and work on many committees have helped my self-confidence and my assertiveness. I'm now able to debate a hot issue with somebody and stay rational. I've also been able to put some of my goals in perspective. I know now that I can't go out and change the world once I graduate. Before I would think, "Wow, once I get my B.A., I'm going to go out there and make some changes because that's what's needed." In five years I've learned that we've been fighting for certain goals for ten years on this campus. Change takes a long time. And when you're very determined to do something and you want things to change, it's very hard to wait. You have to have the patience to wait for change, and just keep pushing.

Martha Lynn Bauman

Senior
Revelle College



Q: How did you happen to come to UC San Diego?

A: I wanted to go to a UC school, and I couldn't decide between UCLA, UC Davis, or here. And because I hadn't made up my mind on what I wanted to major in exactly, I came here. I looked up the requirements at Revelle, and thought that if I did end up taking all those courses I would have a pretty good background, and be able to decide from there.

Q: Did you have a particular major in mind when you came here?

A: I was thinking maybe math or science but I wasn't really sure; I ended up in management science.

Q: What has your experience at UC San Diego and Revelle been like for you?

A: I've really enjoyed it. I think that it has changed a lot since I've been here. A lot. People had told me when I was first going to come here that I wasn't going to like it because I was really involved in things in high school. And they said that there wasn't really that much going on here. But I found that there was plenty to do. I personally have gotten involved in a lot of things at Revelle.

Q: What, for example?

A: Well, after my sophomore year I was an orientation leader for incoming freshmen. Then in my junior year I was a resident adviser in the dorms. And those were both really good experiences. I learned a lot. I know everybody that is in the higher workings at Revelle.

and have gotten to know a lot of different people around campus. Then the following year I was orientation leader again. This year I'm an intern working with the dean's office at Revelle.

Q: Revelle has a reputation as probably the toughest of the four colleges. Do you find that to be true?

A: Not having been at any other colleges, I don't know. But I think that Revelle is pretty tough. It definitely puts you through everything. I know a couple of friends that are at other UC schools that don't come close to taking the variety of things that we have to take just for basic requirements.

Q: What sorts of things have you had to take?

A: For one thing, everybody at Revelle has to be proficient in a language,

which means you have to be able to read a magazine article in another language. You have to be able to talk to two native speakers for about twenty minutes about the article or about anything they might want to ask, and to be understood and to understand them. That's one thing that is different about Revelle. Also, there is a heavy emphasis on science and math.

Q: Aren't you supposed to take some courses in the arts too?

A: Yes. I've taken a lot of different courses: one in drama, three in econ., two in psych., three in humanities, and general courses that were just for interest.

Q: What do you think was the toughest transition for you to make from high school to UC San Diego?

"When I first came here we got together and planned things in groups among ourselves, because there weren't as many organized things. Now, if you don't know what you're going to do on a Friday night there are a million options to choose from."

A: I really had to discipline myself. If anything, that's the thing that I've gotten out of college that will be most useful.

Q: What about your social life?

A: People said to me when I first came here that social life is nonexistent. Students here are serious but everybody has fun and goes out and does things. When I first came here we got together and planned things in groups among ourselves because there weren't as many organized things. Now, if you don't know what you're going to do on a Friday night there are a million options to choose from.

Q: What about the transition of living away from home and moving on-campus. Was it hard on this campus to feel at home?

A: I didn't have any problem at all. I really enjoyed coming to college. The particular dorm I lived in was set up like a suite so there were ten girls. Our rooms came off a central livingroom so we kind of had our own little family. There were always people around, so I never felt lonely.

Q: What about your future plans? What do you plan to do after you graduate?

A: After I graduate I would like to work for a couple of years and probably get into a middle-management training program with some type of corporation. Then I would like to go back to a business school and get my master's in business.

Q: Isn't this a strange place to go for somebody who's interested in going into business?

A: If I would have known I was going to go into something like this maybe I would never have come to this school. But I didn't know what I wanted to major in. And since I do like math I knew that management science was a major that I would like. Plus it's easier to get into a business school with this background, even though there's no business major here.

Q: Have you had a chance to meet faculty in any kind of informal situation other than the classroom?

A: Yes, I have. When I was an orientation leader we would take the new freshmen down to the beach for dinner. We would invite about ten of the faculty to come. So I met them that way or during brown bag lunches the college set up. I've met others during office hours. I haven't gotten to know that many, but

the ones that I have gotten to know are very nice.

Q: What words of wisdom would you offer an incoming freshman?

A: I would say that it helps, especially at first, to study together if you have some friends in your classes. In my first year, in reviewing for Humanities finals, we would get together with about twenty people and just go through the subjects and people would talk about them. I would definitely advise students to meet some of the people in their classes. And if they have problems then they should feel free to get help, not only from friends, but also from services available on campus.

Q: Do you like the college system?

A: Yes. That's another reason I came here as a matter of fact. In Revelle there is a certain sequence of things you have to take. So gradually you get to know (at least by face) who is in your classes at Revelle. That really helps a lot with college identity. Plus, it's nice the way the living areas are separated because it's easier to get to know people. You don't feel like you're one little speck in this huge dormitory. I think that's one of the drawing points of UC San Diego.

Vivien Smith

Junior
Muir College

Q: How did you decide to come to UC San Diego?

A: I felt that I wanted to go away to a school that had a good science program. I also wanted to live far away from home, Palo Alto. I visited a friend here to see what it was like, and had a very good time socially, while learning a lot academically about the school. And I liked the idea that the campus here is isolated a bit. It felt like a real campus community. Now I wish, though, that there were a little more integration between the campus community and the outside community. Because it's hard if you don't have a car, which I don't.

Q: Has the campus lived up to your expectations after three years?

A: It has lived up to my expectations, in fact, exceeded them. I've been involved in a lot of activities which have made the school for me. I've enjoyed my courses and have had reasonably good teachers. I also have done well in my classes which really helps. But I have found that people who are dissatisfied with school are those who sit back and wait for someone to serve them on a silver platter. People who get out and get involved enjoy the school and stay here. They develop a strong sense of identity with the school.

Q: What kind of extracurricular things do you get involved with?

A: I play viola so I play in various music groups, such as the La Jolla Civic and University symphony. I also play soccer on the women's soccer team. I am also an H.A. (house adviser).



Q: H.A.?

A: It's just like R.A. (resident adviser). At Muir every two floors of the dorm are called a "house," and you have two house advisers for each house. This year I'm H.A. for the apartments which are right next to the dorms. I also work in the college center which they've just started this year called "MOM."

"Right now the ideal location is for me to live on-campus in order to be surrounded by my peers. It's good to be able to have midnight talks about many things: maybe life in general, or the chemistry test we just had."

Q: Where is that?

A: It's right underneath the cafeteria at Muir and used to be an old TV lounge. We turned it into an information center, a centralized location which includes a lounge and a game room.

Q: So you've lived on-campus since you've been here?

A: Yes, but next year I'm going on the Education Abroad Program to England. The year after that I think I will stay on-campus since I probably will live off-campus the rest of my life. Right now the ideal location is for me to live on-campus in order to be surrounded by my peers. It's good to be able to have midnight talks about many things: maybe life in general, or the chemistry test we just had. I also feel that living on-campus is convenient.

Q: Do you feel that this is a highly competitive academic situation for you?

A: Yes. I also think that it's more self-

competition rather than against your fellow students. I found all my fellow students very willing and eager to help me, just as I was with them. Even "the premed cut-throats." I have not met any premeds that go around sabotaging experiments, or are not willing to share.

Q: Are you a premed student? And do the premed courses meet up to your expectations?

A: Yes, I am. The courses are very demanding, and you really have to work hard. There's also an attitude here that a C is almost a failing grade. People also complain that it's difficult to get A's and easier to get B's, and I agree with that. It depends on the class. You can work really hard and just miss that A. And that hurts. On the other hand, if you keep plugging away, it shows. People do think highly of this school so I don't think that if you get a couple of points lower on your grade-point average the graduate schools are going to consider you a bad student. And from what I hear about the other UC's, this is one of the more demanding ones.

Q: How do you feel about Muir College?

A: I really like it. Their philosophy about education, stressing freedom to make one's own choices regarding courses to take agrees with mine. I like the flexibility in the general-education and major requirements. Also, living on campus I feel a good sense of the Muir community.

Q: Is there a sense of "Muirness?"

A: Yes, and there are the little rivalries between the colleges. On Spirit Nights you have each college screaming at the others when UC San Diego's basketball team is playing. I can identify with Muir a lot because of all the activities in which I've been involved. When people ask

me about UC San Diego, not specifically Muir college, I say I love it. Muir is a part of UC San Diego and UC San Diego is a part of Muir, and I don't really separate the two.

Q: What kind of advice do you think you might give to a potential applicant concerning the UC San Diego campus?

A: I would tell him or her to definitely visit the campus, and to stay for more than just one day. People have visited me and I've shown them some sites like the Central University Library. They then know what it's like physically, and they think it's a beautiful campus. But they don't have the feel of what it's like to live here, to interact with the students and professors. Maybe they should go to a couple of classes even if they don't understand the subject at the level being taught yet, in order to get the feeling of what a large lecture hall is like. Sitting in a class with 300 students is a lot different than being in a class of thirty. People should also take an interest in their education once here. If they don't like something they should say so and take an active part in changing it. UC San Diego is known as "typically a science school," and people get scared off and say they can't go here because they may be a sociology major. The emphasis on the sciences is evident when you look at the course listings. On the other hand, there are a lot of options and a lot of courses in other departments that you can take. I'm doing a Muir Special Projects major in medical sociology and have found many varied and interesting courses in different departments which I can combine. The most important thing students can do is become aware of the many department and program offerings, as well as visiting the campus to decide if they feel comfortable and happy living and learning here.

Dail St. Claire Bacon

Senior
Revelle College



Q: How did you happen to come to UC San Diego?

A: Although I'm from the East Coast, I spent my last year of high school here, and I was familiar with the university. I was aware of its strong science departments, and the opportunities here to work with the science faculty in independent research. That's what attracted me at the time.

Q: What have you done since you've been here in terms of research?

A: I worked for about a year and a half in the pathology department in the medical school. The experience taught me several things, not only about the work I was doing, but about myself. Subsequently, I changed my focus.

Q: Were you a premed student?

A: I still am. Actually I was going for a Ph.D. — M.D. in cancer research. Since then I've become more flexible. What I want to do is still go into medicine, but not research.

Q: What did you learn about yourself through your experience in research?

A: I found that working in a lab wasn't something that really suited me. I don't want to stereotype researchers, but I'm too extroverted. I felt I wanted to have more contact with people. In brief, my research was analyzing lung tissue with an electron microscope. And I must say that it was an incredible opportunity to work and learn. Being part of a research team is something that very few people do until graduate school; it was an experience I couldn't match anywhere.

"You have to be aggressive about your education here. I don't think I could have done all the things that I have done if I hadn't opened my mouth and pounded on doors, if I didn't walk into the provost's office and ask for help. You have to realize the opportunities that are here."

Q: How would you evaluate your experience and your life here at UC San Diego overall?

A: Tremendous. Really jam-packed with so many things. I think that going to a small university allows a student to go into different areas without having to break through a lot of bureaucracy. Since I've been here I've written for the school newspaper; I've participated in my college government and the Associated Students; I've started several organizations, and I've started a health newspaper. It comes out quarterly now. Sure, doing all those things has led to a small amount of over-extension in a way. Still, I don't think I would be able to do all those things in a large university.

Q: What was it like at Revelle college? I've heard that it's tough.

A: It is in a sense. It depends on how you define "tough." It's rigorous, but still I've found some flexibility in the system. I found a lot of support in the provost's office, with the academic advisers, and the dean. They have given me a lot of guidance. You have to be aggressive about your education here. I don't think I could have done all the things that I have done if I hadn't opened my mouth and pounded on doors, if I didn't walk into the provost's office and ask for help. You have to realize the opportunities that are here. And this is what I've done.

Q: You seem to be a student with a certain sense of direction, and you have a pretty good idea about what you would like to do. What about the student who comes here and doesn't know what he or she wants to do? Do you think that this is a good place to find out? Or do you think it's an advantage to come here knowing what field you're interested in?

A: Well, I think this school is good for those people who don't know what they want to do. I'm thinking of Revelle because the structure of Revelle allows you to prepare for any major. So after the first two years you've had exposure

to various disciplines and have a foundation with which you can pursue any major.

Q: What about your social life? Did you have any problems finding things to do?

A: There again, I think you have to be aggressive about your social life. Because there are things here that are available to students and that you can start up yourself. It only takes four students to start a student organization. Student organizations can sponsor programs and have all kinds of activities.

Q: What were some of the things that you found surprising, or difficult, or not so difficult when you came to college?

A: I've been told my coming to college was a lot different than most people's coming to college, because I came from the East Coast schools, and the whole East Coast environment. I was a bit of a loner my first year. School was all work for me, it was all academics. And this is what I thought college would be all about. When I came here I gave up a whole bunch of things . . . tennis and horse-back riding. I even gave up taking a P.E. course. I figured I must not waste my time, I must be in the library. I think that's wrong. I found out that it was wrong for me in terms of my physical health and my emotional well-being. You have no releases when you spend all your time with your studies. You can't deal with the stress or the pressure that comes with going to college.

Q: Did you live in a dorm when you first got here?

A: No. We had a little summer house down here and I lived there. My mother felt that since the dorms weren't supervised and didn't have a housemother, and no check-out and check-in times, that they weren't safe. So I wasn't living in the dorms, and I think that that was a mistake in a sense. Some people get along fine, living off-campus their first

year, but it's hard to get integrated into college life. Still, I think we have an excellent commuter resident program now which plans a variety of activities.

Q: Did you ever live in the dorms?

A: Yes, but I didn't take part in the dorm's social activities. I really didn't feel a part of the dorm life in general. I felt very removed from a lot of things that were going on. I just wanted to do my work and spend all my time in the lab. It took some growing up and some help from professors who recognized what I was going through before I came out of it. I had a freshman ask me the other day if she should sign up for a P.E. class, if she would have time for it right now, or should she wait until later on during the year. And I saw myself all over again. So I sat her down and told her about what happened to me. Because I don't think what happened to me has to happen when you come here.

Q: What sort of advice would you pass on to the prospective student who would be coming to UC San Diego? Are there any tips or ideas?

A: When you come to UC San Diego each college has its own orientation process. I would encourage people to take it seriously, although some of the programs planned might not apply to them. I think that college is not only an academic experience, per se. I did some growing up here. If you don't know what you're going to do, this is the right time to find out. So as a new student be open-minded. I would continue to emphasize being aggressive about your education. And not only in terms of academics, but also your social life. There are things here you learn that aren't in your classes and aren't in your books that are still very much a part of college and college life.

Terry Bates

Junior
Muir College

Q: How did you happen to come to UC San Diego?

A: What it came down to was that I wanted to stay in California. So I applied to three private schools and the UC system. UC San Diego was my first choice. I chose Muir because I had heard a lot from my friends about the Muir programs of allowing you to structure your own major. Looking at the *General Catalog* I liked the idea of not having my entire college experience programmed for me. The idea that I could do the

program on my own appealed to me, and that's essentially why I chose Muir.

Q: What is your field of interest?

A: I'm interested in foreign relations.

Q: How does that tie in with what you're doing at Muir now?

A: I'm taking a language, Chinese, which satisfies a requirement. I'm concentrating a lot on foreign affairs in my political science classes, and taking some other classes in economics that deal with international issues.

Q: How have you experienced life here? How have you enjoyed UC San Diego?

A: I chose UC San Diego and Muir without ever seeing it, even though I was in the North County. I just looked through the catalog. So when I came down here I was really surprised that it was more of a community and not like what I had seen on television about colleges and universities. It was not just students, and not completely isolated. UC San Diego campus is really open. It's not like you're in a college atmosphere; it's more like you're actually living on your own, and attending these classes and actually learning.

Q: So what you're saying is that it's almost a requirement for students who want to have a social life to go out and seek one?

A: No, it's not that active a process. All you have to do is pass by the Muir college center and look on the information board to see what's going on on-campus. They list not only Muir, but also all current activities. There are a lot of things like the UCSD Theatre, movies on campus, and a lot of club activities. If you look at the University Events calendar there are two or three events for every day. All you have to do is just pass the center or go to one of the other information areas and look up to see what's going on.

Q: Are other students friendly or cut-throat?

A: I thought it would be cut-throat but it isn't. I think living in dorms in my fresh-



"I did discover that there was a happy medium between concentrating on my studies and involving myself with the social activities on campus. It was hard. It was a lot harder than high school. But if you spend the time on it you learn a lot more. It's more interesting than high school."

man year was one of my best experiences. Actually living away from home, in a small suite with six or seven other people. It's like you're creating your own family. The first people you come in contact with are your suite mates. You and your suite mates are selected according to major or the area of concentration. It really helps in studies because you have those people to depend on.

Q: Do you have any specific plans for the future?

A: It's kind of a toss-up now. I'm planning to go to a private law school and I'm also interested in applying to the foreign service. I would like to concentrate on an Asian country. My mother is Chinese so I became interested in the Chinese language. Currently I'm not sure whether I'm going to go directly into foreign service or law school. If it is law, it's going to be something related to international law and international tax laws.

Q: What advice would you give to an incoming student?

A: I think that it's really critical at first to make sure that he or she selects the right college. I am very happy with Muir because I made comparisons and I

knew exactly what I wanted. I think before a student comes here he or she should make an analysis of Revelle, Muir, Third, and Warren colleges. I see a lot of students that are unhappy with what they have to take. Unless they are aware of exactly what the general-education requirements for each of the colleges are, they might get discouraged when they get here. Once you look in the catalog and see the areas of concentration and the general-education requirements, it's pretty clear that one college will emphasize science, the other will be a little more liberal, the other concentrates on Third World studies, and depending on your area of concentration, you should choose the college based on what you plan to do.

Q: What do you think (coming from high school) was the biggest surprise for you when you had to make the transition to college?

A: I thought college wouldn't be so much "up to you." I was really surprised at how much leeway you had. And how if you didn't show up at class it wasn't like the hard lines you would get in high school. They figure that if you got here that you're pretty interested in your

education. It's up to you to pursue it. And that was my big surprise. My high school was pretty structured.

Q: Did you have any difficulty with the work?

A: The first quarter I was here I really concentrated on my studies. I was afraid because I had heard a lot about how hard the UC system was. After applying myself I did fairly well, but I wasn't enjoying it. I did discover that there was a happy medium between concentrating on my studies and involving myself with the social activities on campus. It was hard. It was a lot harder than high school. But if you spend the time on it you learn a lot more. It's more interesting than high school.

Q: What about your social life on campus?

A: That's a big complaint. A lot of people complain that there is no social life. But there are a lot of available activities. If you want things to happen you can have them happen. The people that are saying that there are no activities are just like me in my freshman year. I complained that there were no activities because I wasn't getting active in the college.

James Arnold

Professor of Chemistry

It has been eleven years since American astronauts first landed on the moon. The trip, which gave America a "victory" in the so-called "space race" was an historical achievement — a magnificent triumph of science and technology. On their return to Earth, the astronauts and their colleagues who made subsequent journeys to the moon, brought back with them samples of lunar soil or "moon rocks."

James Arnold, professor of chemistry, was on hand when the first samples of moon rocks were brought to the window of the quarantine station for the scientists, clustered on the outside, to see. Arnold remembers having the same feelings then that he did when his first child was brought to the window of the hospital nursery.

Arnold has spent the past decade studying some of the moon rocks and learning more of the geochemical composition of Earth's nearest neighbor. To Arnold, the most important things that have been learned are key chronological points, "We know how long it took for the moon to be finally assembled," he says. "We know when the moon was made and we know what the moon is made of — the surface layers at any rate. And we know that almost nothing has happened on the moon in the way of interior activity for the last three billion years," he adds.

Arnold received his Ph.D. in 1946 from Princeton University. He moved to the University of Chicago as a post-doctorate fellow and later worked with Willard Libby and Harold Urey at Chicago. He joined the faculty at UC San Diego in 1958 as an associate professor of chemistry. Two years later he was appointed professor and first chairman of the Department of Chemistry.

Q: Were you always interested in becoming a scientist?

A: Probably the most pertinent thing regarding my interest in science as a career has to do with my parents. We lived in suburban New Jersey, the area near New York City. We had a seven-acre "farm" but my father went to New York every day. He was a lawyer, but if

he could have made a living from it, he would have been an archeologist. He was very interested in Egyptian archeology, and in many other things as well: foreign and ancient languages, science, politics, even cactuses. I don't know of anything in which he wasn't interested. We had an enormous library of about 10,000 books at home.

"I think I was most impressed when a moon rock numbered 10020 was exposed on the other side of the quarantine glass in Houston."



"When I was thirteen a number of things happened which made me decide I was going to be a chemist instead of an astronomer. One was that my father bought me a large Chem Craft set. He was a born teacher. He gave the neighborhood kids and me a course in chemistry from the Chem Craft set in our basement."

My mother was a former school-teacher. I was an only child, so she had enough time to spend with me. I had a very stimulating home environment. I was reading popular books on astronomy as far back as I can remember. There were very good popular books at that time: Eddington, Jeans, Gamoro. When I was thirteen a number of things happened which made me decide I was going to be a chemist instead of an astronomer. One was that my father bought me a large Chem Craft set. He was a born teacher. He gave the neighborhood kids and me a course in chemistry from the Chem Craft set in our basement. My father also got me a small telescope. It was then I discovered my eyes were bad. I had known they were bad, but they tired especially quickly from looking through the telescope. Today, I don't know of any astronomers who look through telescopes with their eyes. But, as a child, that was a factor. Also we had a family friend by the name of Salman Waksman. He was then an obscure teacher of soil microbiology at Rutgers University. Waksman eventually won the Nobel Prize for discovering streptomycin. I think that just seeing him, talking with him, and getting to know him also steered me in a chemical-biological direction and reinforced my interest in science.

Q: You were involved in the early days of the space program and the moon landings. What was it like?

A: When Sputnik went up I was like many other people — utterly enthralled by it. I followed the developments very closely. Probably the key association that led to my deep involvement was my coming here to UC San Diego. I had been a research worker and later a faculty member at the University of Chicago and had gotten to know Harold

Urey. When I came here in 1958 Harold had just arrived here also. The combination of Sputnik and Urey was definitely irresistible. I was simply drawn in and found myself one of the early volunteers for the planning process of space experimentation. I proposed a gamma ray experiment to determine the chemistry of the moon and Urey became very enthusiastic. He spoke about it to a number of people, which encouraged me even more. I had to do it, and found at that time some collaborators at the Jet Propulsion Laboratory. We proposed that experiment for the Ranger series of missions.

Q: You proposed it to NASA?

A: Yes. We made the first proposals in 1961 and the Ranger series of missions were flown as early as 1962 and 1963. However, they failed. The experiment didn't fail, the missions did, which was a common experience at that time. It was very disappointing, but we were determined to continue. And so by 1963, with the failures behind us, we had credentials in the field. When the Apollo program came along I was one of the first people asked to give lectures to the astronauts about what lunar materials might be like and why they were important.

Q: What were your reactions when you first saw the moon rocks?

A: I think I was most impressed when a moon rock numbered 10020 was exposed on the other side of the quarantine glass in Houston. This took place approximately ten days after splash-down. Seeing my first child from the other side of a pane of glass was a similar emotional experience. Both times I had a tremendous thrill and feeling of awe that, "... it's really here!" And seeing the moon rocks was like

seeing my baby: At first, your baby looks like anybody's baby. There's a room full of babies in a maternity hospital and yours is just one of the many. But of course it's unique. With the rock I had the same feeling: at first, it looked just like a rock. Then, when I looked at it closely I began to see things that are absent in terrestrial rocks, for example, little rims of glass around crater pits. Three or four of us were all standing with our heads dirtying the glass, arguing, trying to identify parts of the rock, and get a closer look.

Q: Have you been directly involved with all of the manned landings on the moon?

A: Yes, and we've had samples from all of them. On Apollo 11 and 12, I was part of the analysis and planning team. On Apollo 13, I helped train the astronauts to gather samples, document them, and give them maximum scientific yield. On Apollo 15 and 16, we had an experiment so we were inside Mission Control for the duration of the missions. It was a fascinating experience.

Q: Would you encourage young people to go into careers in space science? Is it still a promising field for the future?

A: I would certainly encourage anyone with the same fascination and drive for space as I felt to go into it. The future is simply unknowable, so I would say to anyone who is thinking about a career in which he or she can make a comfortable living doing something else, that it is probably ill-advised to pursue a career in space science. At the moment, the number of people who are going into space science is relatively small, and the opportunities are also limited. But the students who do get through find jobs. Good people can make it and will make it, I am sure.

Shirley Strum

Assistant Professor of Anthropology

"There seem to be broad, biological patterns in primates that have to do with reproductive strategies that influence the way individuals make choices. This has generated some new research and renewed interest in using non-human primates to interpret human behavior."

Close observation of baboons in the wild suggests that early humans or pre-humans possessed a predisposition for male and female roles in society, at least in terms of hunting behavior. This is the conclusion of Shirley Strum, assistant professor of anthropology, after three years of living in detached harmony among the primates in Kenya.

"Anthropologists for many years have realized that hunting played an important role in human evolution and until recently it was thought that humans were the only primates to hunt," she says. "When you look at the archaeological record, many human activities can be tied into the hunting way of life."

This "human-only" theory changed when Jane Goodall observed chimpanzees hunting. Subsequently, Strum discovered that baboons also hunt in very sophisticated ways, stalking, capturing and killing at least six species of antelope in addition to birds and hares.

"This is important particularly because it gives us some information about how behaviors can change within the complex setting of a primate group and it may provide clues to the evolution of human behavior," Strum says.

Strum's work with the Pumphouse Gang — a troop of baboons on the Kekopey Ranch in Kenya — has been featured in National Geographic and has been made into a movie. Anthropologist Strum joined the UC San Diego faculty in 1974 after receiving a Ph.D. from Berkeley. Her first direct observation of primates came in 1972 when she went to Kenya to do field research for her doctoral thesis.



Q: How did you first become interested in anthropology?

A: I was born in Germany after the war. My parents immigrated to California so I grew up in San Diego. I went to Berkeley as an undergraduate and was looking around for a field of study. I was interested in human behavior and wanted an approach that was a little more scientific, but not too rigid. As a result, I got interested in anthropology, at first in cultural anthropology because I liked the cross-cultural perspective. Then I took a class in physical anthropology and realized that that was for me. I liked the area of primate behavior better than the fossil evidence for human evolution, especially since at that time it was a new and growing field. I went on to graduate school at Berkeley, one of the few places in the world that was doing that kind of work then.

When I got interested in primate behavior it was at a time when people still believed you could use simple primate models for early man. They believed you could go out and look at baboons for example, and use aspects of their social organization to model early hominid social organizations. But the more information we acquired on non-human primates, the more studies that were done, the more it became apparent that you couldn't use these simple models.

Q: How would you contrast the study of humans to the study of other primates?

A: I thought the dynamics of human interaction were too complicated by culture and language to be easily understood. But there were other primates who lived socially complex lives without culture and without language.

“The more I’ve watched, the more I’m convinced that a lot of things that we think of as uniquely human are also present among baboons.”

Perhaps without using these other primates as models, you could still gain some insights into basic mechanisms that are difficult to see in the human context. I did my dissertation research on an issue of male and female roles in baboon society. Previous baboon studies had identified males as being very important to baboon social organization and that idea had permeated all the literature, both scientific and popular. The notion was that society was male-dominated, by aggression and hierarchy, and males controlled all the important functions in the group.

This was generalized to other primates and also to early man, especially in the popular literature. The early baboon studies only identified males as individuals and didn’t systematically sample all the animals in the group. I was interested in whether what was presented was an artifact of the sampling method. I wanted to look at baboons again with more systematic sampling techniques and see whether I would have the same ideas about baboon society. Of course I found that baboons are quite different from the original impressions. And now there’s enough information accumulating in the field that new generalizations are possible. There seem to be broad, biological patterns in primates that have to do with reproductive strategies that influence the way individuals make choices. This has generated some new research and renewed interest in using non-human primates to interpret human behavior. At this point, however, I’m more interested in baboons for their own sake than I am in what they specifically say about humans.

Q: Where did you do your studies?

A: In Kenya, right in the middle of the country, in the central Rift Valley near a village called Gilgil. I’ve worked on the same population of baboons since 1972, on a private ranch called Kekopey. The ranch is 45,000 acres and has more than a thousand baboons

on it in ten different groups along with a large wildlife population.

Q: What, then, have you learned about baboons?

A: I began looking at baboons with an orientation which said, “Quantify; do not project human motivations or make interpretations that go beyond what your simple uninterpretable, quantitative data allows.” The more I’ve watched, the more I’m convinced that a lot of things that we think of as uniquely human are also present among baboons. I’m currently playing around with an idea about baboon politics and social strategies and how they manipulate social relationships and each other. In a way it seems so characteristically human, that is anthropomorphic, but I have some good quantitative data to show that baboons are capable of using complex strategies, of assessing alternatives, making choices. In class I joke that they don’t have a little hand calculator to figure out a cost-benefit analysis of each of the behaviors. But in the same way, neither do humans. Yet both make complicated decisions. I suppose what I’ve learned about baboons is that they live in an incredibly complex social group, with multiple social networks that sometimes overlap and that when these networks come into conflict, individuals have ways of resolving those conflicts which are predictable but not simple. I can tell you what so-and-so is going to do to so-and-so, in general, but in a specific case it will depend on who’s around, what the resource is, what that animal did earlier — a varied set of factors. I think baboons are very smart about social life and interacting with others, whether or not they consciously think about being smart.

Q: What then have you learned about humans through studying about baboons?

A: You gain a different perspective on humans when you look at areas where there might be parallels in baboons. In a talk I gave at Irvine I was comparing politics and aggression in both baboon

and human societies. What is made clear by that comparison is that for baboons, individuals make choices about using aggression or other means to get what they want, based on the realities to them of the costs and benefits of the different alternatives, and sometimes they manipulate social relationships rather than use force. When you look at human politics, you see the same range of strategies but you see two innovations. One is that humans have language so that individuals can manipulate other individuals’ behavior more powerfully and in a new way. Humans also have new kinds of weapons that exist outside of their bodies. Baboon males have weapons; they happen to be their canines. Starting with hand axes, human weapons now include the nuclear bomb. Those two new factors, language and weapons, have combined to allow the costs and benefits of aggression to be disassociated for humans, so that the individual making the decision about aggressive behavior (a political decision), may be making it only on the basis of the benefits of the aggression to him or to somebody else. He will not experience the cost. On the other hand, somebody else will be experiencing the cost and not the benefit. This disrupts what is a series of evolutionary (biological) checks and balances about the use of aggression or power in most animal societies. What you can see in the comparison of baboons and people in similar situations is that within the baboon system, the checks and balances still exist.

I’m not saying that humans act like baboons. But, by using that framework you can see where the real differences are even though baboons are much more like humans than we previously thought. Understanding the differences, and also understanding how innovations may have disrupted the evolutionarily old patterns, provides a better perspective on why there are certain problems among humans, and in what areas the solutions might be found, even though you’re not able to implement the solutions immediately.

Millicent Abell

University Librarian

"One of the major efforts we're making here with first-class cooperation among our faculty colleagues is to introduce increasing doses of library education into the basic curriculum."

Millicent (Penny) Abell, UC San Diego's librarian, is surrounded by books, some 800,000 of them in the Central University Library. She has access to a half dozen of the finest private collections in the country.

So what does she read when she goes home in the evenings? "Spy novels! I love them all," she says. "My son goes to the library and gets me the latest spy books. They're great for pure escapism. I usually read them before I go to bed."

Abell, who was appointed University Librarian in 1976, admits that she has to do some serious reading as well. Administration and educational journals are required material. When she can get away from her office on the second floor of the Central University Library, she may go up to the eighth floor where the special collections are kept. There she leafs through rare books on such subjects as Baja California, Pacific voyages, and the Spanish civil war.

She is understandably enthusiastic about the libraries under her jurisdiction. As a professional in the field whose work took her from the University of Washington in Seattle to the State University of New York at Buffalo, she admires the breadth and scope of the libraries on the UC San Diego campus.

"There is a very high-quality research and teaching program here," she says. "The faculty and students are heavy library users. The collections we have show a remarkable quality and breadth."

Abell holds a B.A. degree in psychology from Colorado College, an M.A. in student personnel administration from Columbia University, an M.L.S. from State University of New York at Albany, and an M.A. in political science from the University of Colorado.



Q: Why do you prefer UC San Diego to the other places you've worked?

A: I came to San Diego from State University of New York at Buffalo where I was the associate director of libraries, and prior to that I had been at the University of Washington in Seattle as assistant director of libraries. This is my favorite of all the jobs I've had because

UC San Diego is just such a terrific place to be. The people here are of such quality and so interesting that every day is new and no problem is too much, no problem is overwhelming. The attitude is one of "we will succeed regardless of external threats or internal problems." I just think that permeates the atmosphere. This is the best library staff, I

"So the particular challenge now is how to select from the universe of information and organize it in such a way that the person who needs information can get at it most easily. The librarian is a bridge builder, a pathfinder, a broker between all that mass of what's available and the individual who has a peculiar need."

think, in the country; the best group of people I've ever encountered — very, very vigorous, very creative.

Q: How did you start in library work?

A: I was in student personnel administration at the University of Arizona when I met my future husband who was a career officer in the army. The first assignment he had after we were married was at West Point. I could not use my student personnel administration because there were no women at West Point at that time. I saw a brochure on the graduate program in librarianship and I thought, "Hey, this is a good deal. I can get a job anywhere my husband goes as I follow him throughout the world." As it turned out, we followed each other in taking turns making the moves for career purposes. My first job was in the library at West Point. I was the periodicals and reference librarian in the military academy library. Then my husband went overseas and I trotted along and lived for about nine months in Thailand and picked up a part-time job there with the Institute of International Education. It was a terrific experience. I managed to travel to Laos and to Cambodia, places my husband couldn't go because he was on a military passport. This was during Vietnam. I was helping to review graduates of Southeast Asian institutions who had applied for graduate work in the United States.

Q: What are some of the problems of running a library today?

A: This is a particularly interesting time for libraries. Information is continuing to be produced at ever-increasing rates. Inflation is an especially serious factor in the book business. With the development of new scholarly fields demand is always increasing. So the particular challenge now is how to select from the universe of information and organize it in such a

way that the person who needs information can get at it most easily. The librarian is a bridge builder, a pathfinder, a broker, between all that mass of what's available and the individual who has a particular need. In our day-to-day work, we are trying to do a couple of things. We are trying to facilitate the task of that individual seeker of information. You know, a lot of people think that they ought to be born knowing how to use a library. If they come in and have some trouble, they think there's something genetically wrong with them. That's not the case. At no point does one magically become proficient in using a library because libraries are very complex, particularly a research library. One of the major efforts we're making here with first-class cooperation among our faculty colleagues is to introduce increasing doses of library education into the basic curriculum, teaching people how to find the shortest, simplest path to what they want through this maze. The other thing we try to do is to find ways to make the system easier to deal with. And that's where our computer comes in. We now employ a couple dozen terminals for various uses within the library. I would guess that by the time students who will be entering this year graduate they will be consulting bibliographic information on line. Right now we're in the middle of a project to convert all of the card catalog information in the Cluster Undergraduate Library to a machine-readable form. Our next step will be to mount a pilot project which will allow people to get that information via computer terminal rather than by the traditional means of going through the card catalog. Another project is to convert all of the science libraries' bibliographic information to machine-readable form so that somebody down at Scripps will be able to consult a terminal and know that what he wants may not be in the Scripps library but is in the Biomed Li-

brary. As I said, we're trying to attack the problem for the user in two different ways. One is to teach the users the system and the other is to simplify the system. Librarians are often viewed as rather passive, introspective, and quiet sort of folk. I'm convinced that an academic library can't do its job unless the people in that library are very active and very aggressive. We have librarians whose responsibility it is to maintain liaison with every one of the academic departments, to be out there, to move around, to deal with students and faculty, to know what emerging interests are so that we can anticipate the information needs for those interests. We have an undergraduate library that is staffed by some of the most active people on campus who are absolutely committed to making that library an effective part of a student's undergraduate education.

Q: As a librarian do you feel reading habits and abilities have been affected by television?

A: Certainly not when I look at the utilization of our libraries. Our circulation rates have grown at about twice the rate of enrollment over the last eight to ten years. Every year the number of people using the library grows significantly. I see no evidence that people are using books less. On the contrary, although they're very often using them in conjunction with other kinds of materials. We have our playback center in the Cluster Library where there are computer terminals, video and audio cassette machines, and so on. It is used very heavily. We're interested in those so-called nontraditional materials because we see ourselves as being in the information business. And regardless of the form of information, we think we have a responsibility to assure that it gets to the people who need it.

Paul Pickowicz

Assistant Professor of History

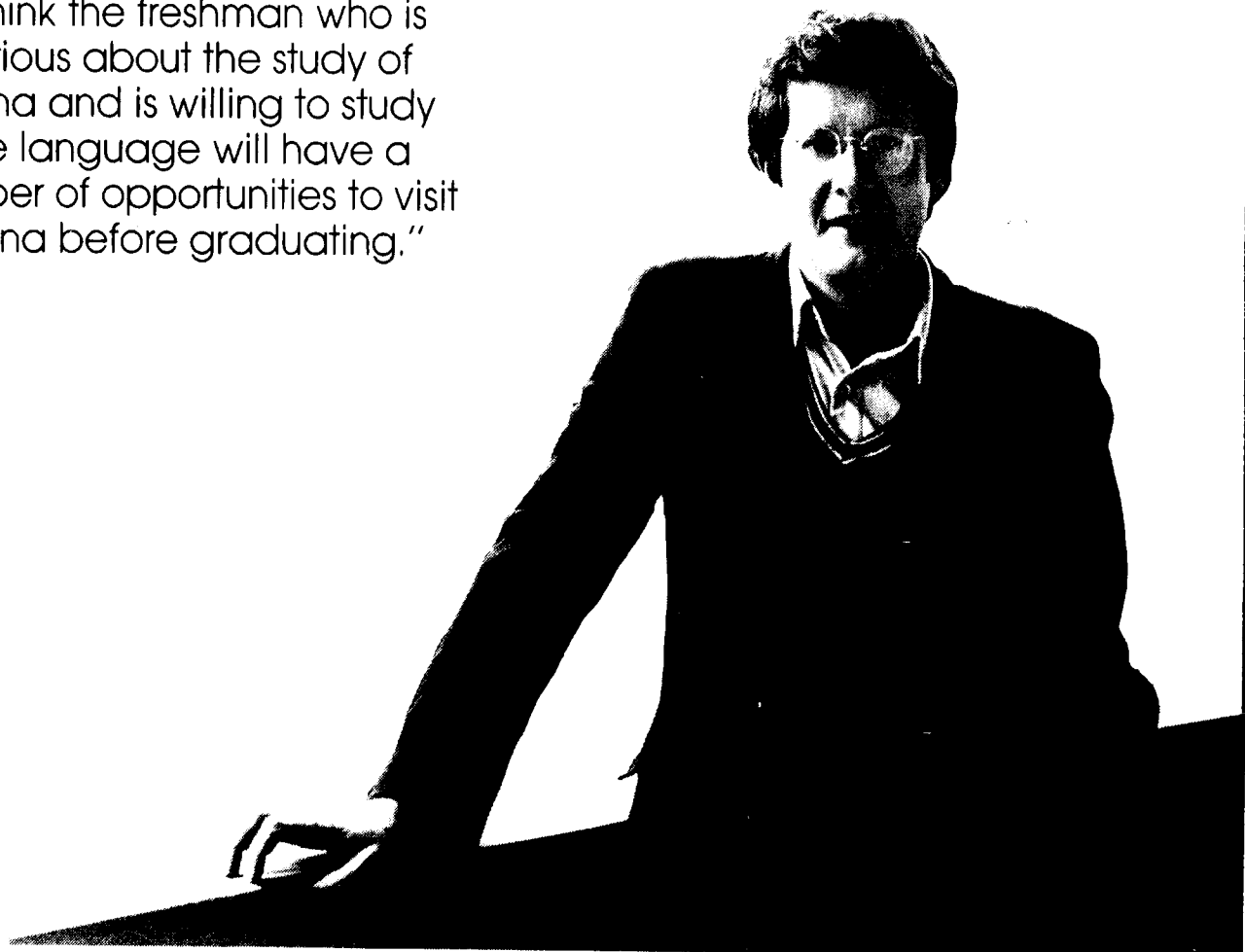
"I think the freshman who is serious about the study of China and is willing to study the language will have a number of opportunities to visit China before graduating."

Paul Pickowicz, assistant professor of history, was part of a four-member team that was the first professionally trained American research team allowed by the Communist government of the People's Republic of China to spend an extended time in a Chinese village doing an in-depth study of the people and their lives.

Pickowicz's visit to the village of Wukung in the wheat-growing area of Hobei Province in north China climaxed a five-year effort on his part to gain the permission of the Chinese authorities to live with Chinese peasant families and study how an agricultural village actually worked. The team spent three weeks in Wukung, a village of about 2,500 located about 200 miles south of Peking.

They were allowed to prepare and administer questionnaires to some 200 families to learn more about their customs, income, child rearing practices, and other aspects of their lives. They were also given access to official village account books.

Pickowicz, chairman of the Chinese Studies Program, joined the UC San Diego faculty in 1973. He received a Ph.D. in modern Chinese history from the University of Wisconsin and taught there and at the Chinese University in Hong Kong before coming to San Diego. "When I came to the San Diego campus, China was only marginally important," Pickowicz says, "but at the moment there is probably the greatest amount of academic interest. Universities are beginning to open up exchange relations with China."



Q: What were your early educational experiences?

A: I'm from New England. I grew up in the Boston area and was educated in the public school system. I was born on Cambridge Street a few doors down from what is now the Harvard East Asian Research Center, but like most others of my generation I had very little exposure to things Chinese in my youth. The history and social science courses in my school simply didn't devote much attention to Asia or China.

Q: What is your family background?

A: My mother's family, the McCarthy's, belong to the Irish community in Boston, while my father's family comes from a Ukrainian farming background. Both families were immigrants who came at the end of the nineteenth or beginning of the twentieth century. When I was young my parents worked in factories in the Cambridge area. I was the first member of the family to gradu-

ate from college. When I was in college I was interested in European history and literature and studied abroad at the University of Edinburgh during my junior year. Strange as it may seem, it was in Scotland that I first became interested in China. During that year, 1966, the Cultural Revolution erupted in China. I was fascinated by the British newspaper account of the Cultural Revolution and began to do a great deal of reading about Chinese politics and society. In my senior year, I studied ancient and pre-modern Chinese history in a more systematic way. During my year in Scotland another major development, the Vietnam War, began to heat up as casualties mounted on both sides. At first I didn't understand the war, but I remember very clearly that some supporters of the war claimed that the real purpose of the war was to contain the Chinese who were behind the scenes. I think it is fair to say that I began to develop a serious interest in China be-

cause of the Cultural Revolution and the Vietnam War. Many in my generation of China scholars got started this way.

Q: This was still as an undergraduate?

A: Yes, my interest began as an undergraduate. China seemed very important in world affairs, yet there was so much misunderstanding of the Chinese revolution in the United States. I did a master's degree in history at Tufts University in Boston, and then went to the University of Wisconsin in 1968 to begin Ph.D. work. It was there that I began to study the Chinese language and decided to concentrate on modern Chinese history. I was particularly interested in the history of the Chinese revolution. Our study of Chinese society never seemed like a tedious academic exercise. We felt that the study of modern China had great contemporary relevance, so we spent a large portion of our free time debating the details of China's recent history. Of course at that time none of us had any realistic hopes of actually visiting China. China was closed to all but a handful of Americans. In some ways I suppose we felt like astronomers studying life on some remote planet. We tried to piece together every shred of evidence to get a clearer picture. I subscribed to Chinese periodicals and newspapers, but China still seemed remote. Documentary films that gave a visual picture were even more important. In particular I remember documentaries by Edgar Snow and Felix Greene. It was a major event when these films appeared on campus in the late 1960s.

Q: What was it about China that fascinated you so much?

A: The most important thing was that China seemed to be such an unknown quantity. It struck me as odd that Americans knew so little about a place that was clearly so important. Periodically there would be a splash cover story in *Time* or *Newsweek*, but the same old images were being brought forward time and again. The news about China did not contain many satisfactory explanations. When I finished my Ph.D. qualifying examinations at Wisconsin I got my first chance to travel to Asia while I was doing research on my dissertation. I lived and worked in Hong Kong. Hong Kong was interesting be-

cause I was so near yet so far from China itself. Hong Kong was, and still is, a bastion of capitalism, but even in the early 1970s there was an extraordinary amount of Chinese Communist presence there. By this I mean that many of the banks, department stores, bookshops, cinemas, and newspapers are run directly or indirectly by the Chinese government. In this way we were able to get a small taste of China without actually being there. Although we had every reason to be pessimistic about our chances, a group of us doing graduate work at various American universities decided to defy the odds and request a group visa for travel in China. That sounds like nothing now, but in those days no American group had been invited to China. It seemed hopeless. We wrote up a proposal and sent it to the Chinese authorities sometime toward the end of 1970. We had no way of knowing what was happening behind the scenes, but in the spring of 1971 the Chinese issued a surprise invitation to the U.S. table tennis team, and that was the beginning of the U.S.-China thaw. A couple of weeks later we got a telegram from Peking inviting us to travel for five weeks in China. As graduate students we were thrilled to be the first academic delegation to visit China since the revolution of 1949. I still remember very clearly the day we walked across the bridge that separates Hong Kong from China. I think we felt like astronauts setting foot on the moon for the first time. For so long we had studied China intensively, but at a distance, then suddenly we were able to meet with many, including the late Premier Chou En-lai, who participated in the revolution. It was exciting to see splendid cultural treasures such as the Imperial Palace, the Temple of Heaven, the Great Wall, and so forth, but it was even more interesting to make a firsthand evaluation of the contemporary political and social scene.

The Cultural Revolution was still in progress at that time. My first visit was a very emotional experience, but there is a difference between visiting China then and visiting it now. In 1971 one only encountered "official" friends. They were extremely pleasant people whose job it was to guide foreigners around. It was possible to learn many things, but one's travels were carefully choreographed. There was really no way to get

behind the scenes and make "unofficial" friends. Even as recently as 1978 this type of situation prevailed. Now I'm excited for my students because things have loosened up a bit in China. One is still supplied with official companions but now it's possible to have unofficial friends, real friends. Now the authorities are somewhat less concerned, and the people, especially young people, will no longer be deterred from having natural human exchanges with foreigners. What one learns from such encounters is that there is nothing particularly mysterious or unusual about average people in China. Their concerns and aspirations, generally speaking, are not much different from our own. They have many of the same complaints and suffer from many of the same problems of daily life. Friendships of this sort tend to break down artificial national barriers and make us more conscious of the basic humanity we share. That is what I have enjoyed most about visiting China in the last couple of years, and I urge my students who go to cultivate the same sort of spontaneous friendships. They're very valuable. You learn much more about the nature of society from these friends than you can by reading official government publications.

Q: What are the chances of the average undergraduate, say the freshman entering UC San Diego this coming fall, visiting China before he or she graduates?

A: Anyone who has a serious interest in China should be able to go. This past year our Chinese Studies Program entered into an exchange relationship with three universities in China. At the moment we have a number of proposals in the works that would permit our undergraduates to go to China on study seminars or language learning programs. The Chinese response has been reasonably encouraging. We are hoping many of our language students will be going as a group for part of the summer of 1981, and during the 1981-82 academic year faculty members in the Chinese Studies Program may be organizing academic field trips to China. I think the freshman who is serious about the study of China and is willing to study the language will have a number of opportunities to visit China before graduating.

Floyd Gaffney

Professor of Drama

"One of the guys had joined the dance club, which we regarded as sissy stuff. Nonetheless, we ended up watching several classes because there were some very lovely young ladies in residence. That's when I decided to dance. I was terrible at first, all arms and legs like a colt turned out to pasture."

Floyd Gaffney bounds from project to project like a dancer stepping spryly to a fast jazz beat, which is no wonder. Gaffney has been dancing since he was a teenager in Cleveland, Ohio, and his early training included work with some of the leading modern and Afro-American dance troupes in the country.

As an accomplished actor and director as well as a dancer, Gaffney often finds himself involved in several ventures at once. He works extensively with community theater groups as well as with his own students. He often can be found directing one production while preparing for another, and his activities take him from New York, where he recently directed a premiere at the Billie Holiday Theatre, to Brazil, where he pursues his studies of Afro-Brazilian dance.

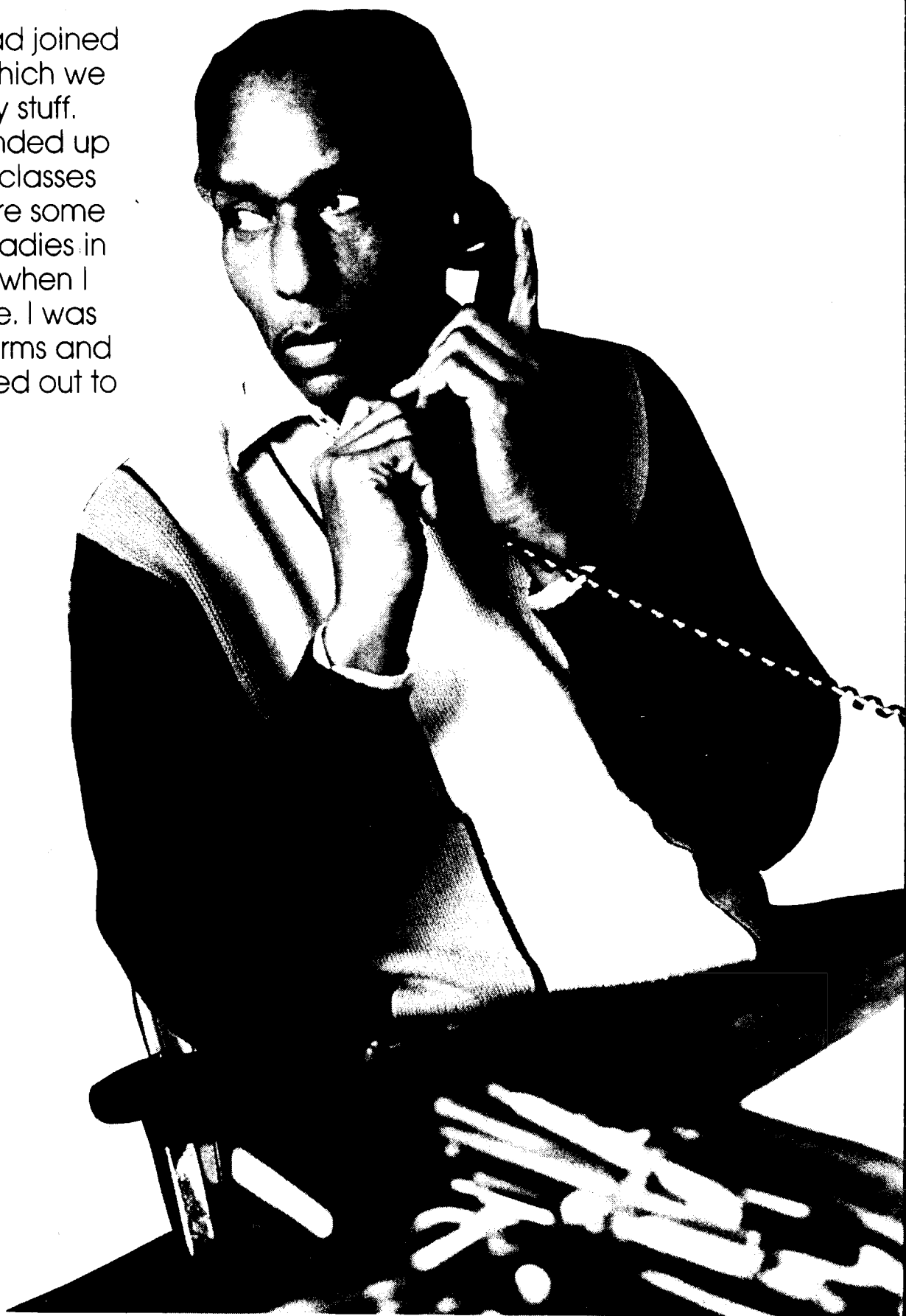
Gaffney is committed to the development of black performing arts programs at the university level, but he also emphasizes the need for all drama students to receive thorough training before they break into the world of professional drama.

"There are certain things with any discipline that are basic to that discipline," Gaffney says. "Take a pianist. He must learn to play his scales, whether he plays classical music or jazz. The same holds true with an actor or dancer. There are certain basic skills that are color-blind, that every performer must learn."

Q. Why did you become a dancer?

A: I first became interested in dance when I was fifteen years old. I received my earliest training at Cleveland's Karamu House, one of the oldest social service agencies in the United States. I initially went to Karamu with friends to play sandlot baseball. One of the guys

had joined the dance club, which we regarded as sissy stuff. Nonetheless, we ended up watching several classes because there were some very lovely young ladies in residence. That's when I decided to dance. I was terrible at first, all arms and legs like a colt turned out to pasture. While studying dance, I was



"My community commitments bring me into close contact with individuals interested in producing contemporary and historical plays of sociopolitical importance that reflect the tenor of our times. Vital community theatre can provide black playwrights, directors, and actors with a forum in which to create, experiment, and grow through theater and all that it encompasses."

also training in the children's theater at the Cleveland Playhouse. Some of my fellow students were such theater personalities as Joel Gray and Joan Deiner. My dancing and acting careers have been parallel ever since.

When I graduated from high school, all I wanted to do was dance. College didn't interest me in the least. I immediately went to New York to begin my career, but within a year Uncle Sam called upon me to do a four-year stint in the armed services.

Given the social, political, and economic conditions for blacks in the late forties and early fifties, I realized that being a professional dancer was tenuous, so I decided to get a college degree after I was discharged from the Navy. I earned a B.A. and M.A. degree from Adelphi University and I continued to be involved in both dance and drama. In 1966, at the height of the civil rights movement, I was awarded a Ph.D. in dramatic criticism from Carnegie-Mellon University. I taught at Ohio University and UC Santa Barbara, and in 1971 I came to UC San Diego.

Q: In what areas of drama do you work?

A: My main area of interest has always

been American drama, particularly the black American contribution. I am also interested in developing highly trained artists who can bring skill and craft to the profession.

My community commitments bring me into close contact with individuals interested in producing contemporary and historical plays of sociopolitical importance that reflect the tenor of our times. Vital community theatre can provide black playwrights, directors, and actors with a forum in which to create, experiment, and grow through theater and all that it encompasses.

Q: What opportunities are there today for the black artist?

A: Many opportunities are available today for black artists to pursue careers in television, film, on Broadway, off-Broadway and off-off-Broadway. Black theater groups are functioning successfully at local, regional and national levels, but one must be realistic. There is an imbalance between the number of people aspiring to the theater and the reality of the job market. These problems are further compounded with black actors, who traditionally are found in the unemployment lines most of the time.

One consideration is that all of the theatrical stereotypes which existed in the nineteenth century, and at the turn of the twentieth century, still exist. Step-and-Fetchit lives in the suburbs, wears Brooks Brothers suits, Stetson lids and Stacy Adams shoes. Observe the black shows that have been successful on Broadway recently! It has been a fairytale and fantasy period with shows like *The Wiz* and *Timbuktu*, to name only a few. And, as James Baldwin recently stated, we have come full circle and have turned to the minstrel period with shows such as *Bubbling Brown Sugar*, *Eubie* and *Ain't Misbehavin'*.

Ultimately, black people will have to develop and support their own theaters without depending on white financial resources. Support must come from the grass roots community and the black middle-class audiences. I'm optimistic. I feel that support for black theater is expanding among the middle class. There are pockets of very strong and exciting theater activities all throughout the United States. One has to remember that the black experience is not separate from the American experience, and that what blacks are contributing is part of the ongoing American theater.

Chia-Wei Woo

Professor of Physics and
Provost of Revelle College

"These days we find all kinds of major universities like Harvard and Stanford and certain campuses in the UC system moving back toward what's called a core curriculum. That's good. It's a swing back from too much flexibility. But to me it's not a complete solution."

Chia-Wei Woo, the ninth provost in the fifteen-year history of Revelle College, feels that a spirit of altruism is missing in today's university students. He would like to see students find some sort of goal in life besides the goal of their careers. He would like them to do something for others.

"In the late sixties students were activists," he says. "Maybe they went overboard. Then there was a backlash with no activism. Today, they are a little too complacent. I realize the major part of their going to the university is to study, but they still have time for outside activities."

Woo, the university's first Chinese-born provost, came to UC San Diego in 1979 from Northwestern University where he was a theoretical physicist and served as chairman of the physics and astronomy department for five years.

Woo came to this country in 1955 to study physics after growing up in Hong Kong and China during the Second World War. He is a man who measures centuries in dynasties and history in family generations.

Woo earned his doctorate at Washington University in St. Louis and spent 1966 and 1967

at UC San Diego as an associate research physicist. One of the things that drew him back to the campus after eleven years was UC San Diego's high caliber. "This is a great university," he says.

Q: What was your early life like in China?

A: It was very hectic. I was born in 1937 when the Second World War started in China. The Japanese army took over Shanghai. My father was in the government service at that time so he retreated along with the government to Hong Kong. Then in 1941 Hong Kong was taken over by the Japanese also, so there was no reason to stay there anymore. We went back to Shanghai where I went to grade school. During my high school years I lived in Hong Kong. I came to this country after high school.

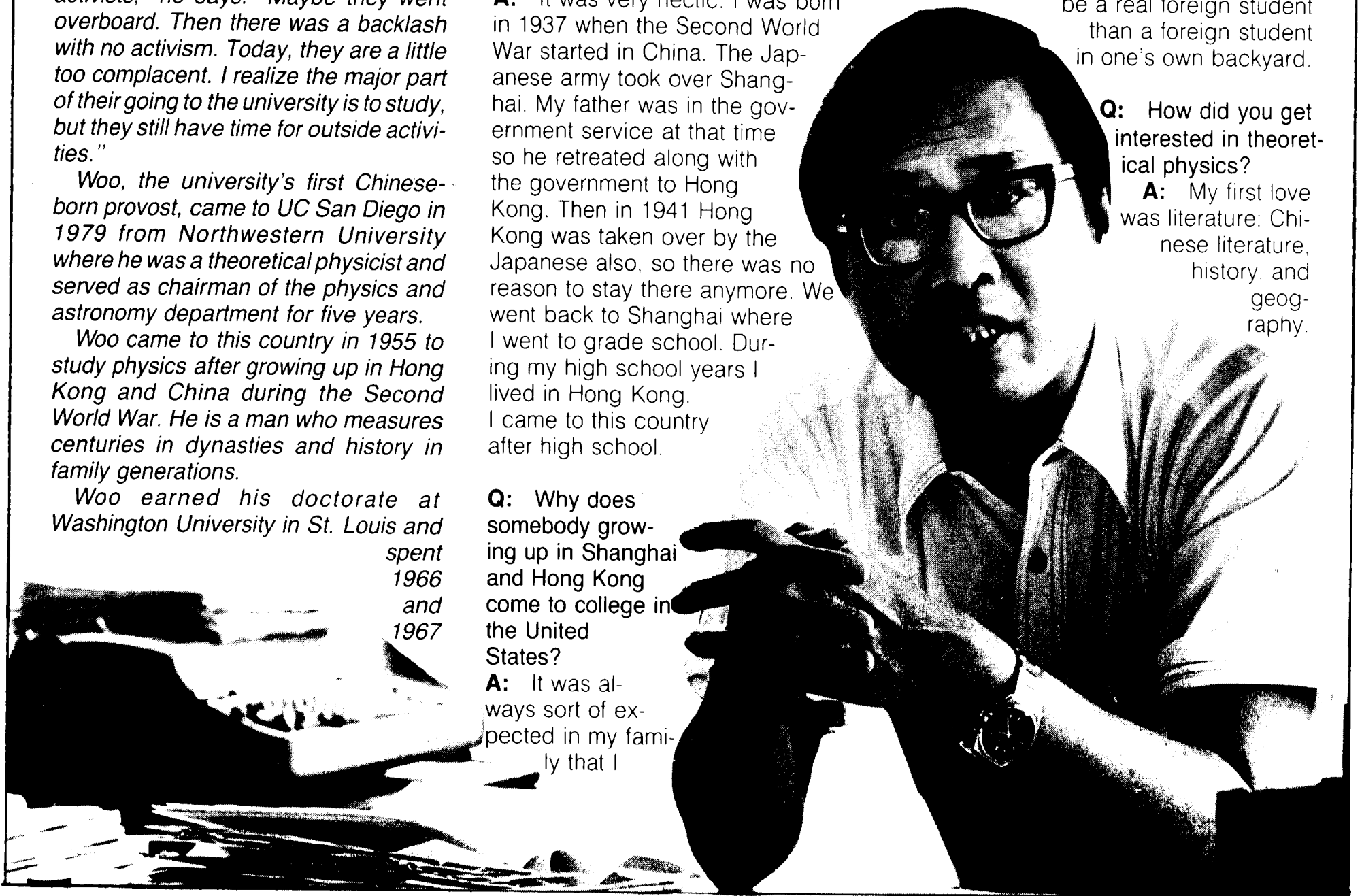
Q: Why does somebody growing up in Shanghai and Hong Kong come to college in the United States?

A: It was always sort of expected in my family that I

would be coming to the United States for higher education. It was planned that I would graduate from college in China somewhere and then come for graduate school. But it didn't work out that way. There was only one university in Hong Kong at that time recognized and run by the British colonial authority. It seemed better to be a real foreign student than a foreign student in one's own backyard.

Q: How did you get interested in theoretical physics?

A: My first love was literature: Chinese literature, history, and geography.



"I understand that college systems have not worked out too well in some universities. But in our case, by any conventional standard, we already have a great university. The college system is, to say the least, an added bonus for the well-being of the undergraduates."

I enjoyed writing novelettes and poems throughout my grade school and high school years. But for my generation, Chinese scholarship *meant* science. If you didn't go into science or engineering you'd have a hard time surviving. Once you are into science, you get hooked — simply because the discipline is so fascinating and overpowering.

Q: Was English a problem for you?

A: I took a number of years of English in high school. But, not unlike the way foreign language is taken here, until you use it, you really don't speak that language well. I didn't speak a sentence of English when I came to this country. That was part of the advantage of going to a very small college in a small town where nobody spoke your language: no English — no food.

Q: What is your specific area of research?

A: My field is known these days as condensed matter physics, "condensed matter" meaning liquids and solids. More specifically, I do many particle theory. What that means is that we work with systems in which the correlations between particles are extremely important. In a gas the molecules move rather freely. Their collective behavior is not terribly important. But in liquids and solids it's actually dominant. Once you learn to do theoretical work in that direction you can apply

it to many kinds of systems. So we've applied it to low temperature physics, surface physics, liquid crystals, nuclear matter . . . It's a powerful theoretical tool.

Q: What's your feeling about the college system? Is it an effective system?

A: I'm undoubtedly prejudiced. But I think unless you are dealing with a small university specialized in say just engineering, or one that has a definite mission, the college system gives you the only sensible approach. These days we find all kinds of major universities like Harvard and Stanford and certain campuses in the UC system moving back toward what's called a core curriculum. That's good. It's a swing back from *too* much flexibility. But to me it's not a complete solution. It provides an answer to a problem which has not been formulated well. What they are looking for is that one uniformly applicable, optimum educational philosophy that fits every student that enrolls. In all likelihood such an optimum doesn't exist. Let's look at my own family. I have three children, and those three children will be going to different colleges at UC San Diego simply because they have different personalities and goals. (We are having a fourth child to fit our four-college structure.) The same thing is true for faculty. The minute you talk to a new faculty member you can see right away how he or she looks at education. In our system we actually allow for four very different

educational philosophies. If you take a faculty member from Revelle College and one from Warren, for example, they can have a real argument on who has a better curriculum. And that's the way it ought to be. If you believe in rigidly enforcing a liberal arts education, join Revelle. If you believe in a more preprofessional, career-oriented education, don't join Revelle; by all means go to Warren. You don't need a grand compromise, winding up with a dilution of ideals.

I understand that college systems have not worked out too well in some universities. But in our case, by any conventional standard, we already have a great university. The college system is, to say the least, an added bonus for the well-being of the undergraduates. This college system brings a breath of fresh air on the higher education scene. Because of the college system, our curricula remain diverse but stable. We don't jump on and off the bandwagon and swing with the winds of change. The Revelle curriculum, for instance, hasn't changed in sixteen years — even though many students who are here complain about how rough it is (with pride, I suspect). But as soon as they get into their junior or senior year, or as soon as they become alumni, they come and tell us: "Don't change a damn thing. What you've got is the best." I'm sure that Muir students, Third students, and Warren students feel the same way about what they've got.

Gerry McAllister

Mandeville Gallery Director

"No matter what was around me, I found a way to make art. I dug my own clay, I asked the neighbors for paint, and I collected wallpaper sample books and strips of cloth for collage."

Visitors to the Mandeville Art Gallery at the west end of the Mandeville Center for the Arts at UC San Diego can bear witness to the eclectic nature of art today. Such diverse contemporaries as modern artist Frank Stella and editorial cartoonist Paul Conrad have exhibited there. Performance art, video art, ecological sculpture, painting and collage, as well as art offering an historical perspective, have all been presented in the gallery.

Gerry McAllister, a staff member who originally came to the San Diego campus as a student, is the person responsible for the operation of the Mandeville Gallery as well as the Mandeville Annex, the student gallery. She mounted her first shows during her tenure as a graduate student and eventually was called back as an assistant to the gallery director.

"At first, I did everything from running errands and ordering equipment to repairing and painting the walls," she says. Today, she works out of an office adjacent to the gallery which is often crammed with packing crates and boxes in addition to desks, files, reference materials, and two telephones.

McAllister's work now takes her around the country in search of shows that will be of interest not only to the campus but to the San Diego community as well. In 1979, McAllister was named one of San Diego's fifty "movers and shakers" by a local newspaper.



Q: How did art become part of your life?

A: I have always had a desire to make art. I grew up during the Depression and I had very little cultural stimulation, because we had no money to go places. No matter what was around me,

I found a way to make art. I dug my own clay, I asked the neighbors for paint, and I collected wallpaper sample books and strips of cloth for collage. I've just always had some sort of natural creative instinct.

I graduated from high school when

"What makes an art form last for any length of time is whether the major museums will collect it and whether people will buy it. Politics, money, what's going on in the world, all of these things have a direct relation to the art world."

the Second World War was going on and I had not been counseled to go to college, so at the age of seventeen I went to work on an air force base. After that I worked as a legal secretary for a while, then I quit work and that was it.

Q: Did you ever take any art classes?

A: My first classes after that were adult education classes, the kinds of classes the housewife attends after she puts her children to bed. In 1970, I transferred to UC San Diego as an undergraduate. I got my B.A. and then I earned my Master of Fine Arts degree in two years. I was a painter; I graduated as a studio artist, and I was advised to try to get exhibitions in Los Angeles and San Francisco. I felt that I needed a rest, so I stayed home until I got a call from the Department of Visual Arts asking me to come in and work part-time. Eventually, I found myself running the art gallery.

Q: How do you choose the exhibits that are shown in the gallery?

A: We do five or six shows a year in the gallery and we're always ruled by the budget. Basically, we show contemporary art and occasionally we do try to have an exhibit that deals with art history. We usually try to bring in some of the new things that are being done.

Q: What are these new "things" in art?

A: In the 1970s, art just exploded, it just went in every direction. I don't know what will catch on in the '80s. What makes an art form last for any length of time is whether the major museums will collect it and whether people will buy it. Politics, money, what's going on in the world, all of these things have a direct relation to the art world. The major museums have been relying on blockbuster exhibits because they're underwritten by corporations and they attract a large audience. We've seen exhibits like King Tut, the Treasures of Dresden, and the Peruvian gold exhibit. But I think galleries and museums are beginning to show contemporary art, or "art now," again.

Q: What trend do you see in the art world today?

A: One new form of art in the galleries today is performance art. Often an artist will do a performance or make a work of art which is not a lasting work of art. This kind of work is ephemeral; you can't collect it and it won't go into museum archives. Artists are no longer making paintings which must be put on stretcher bars and preserved. They are painting directly on the gallery walls and then painting over it when the show has ended. They document it, and the docu-

mentation becomes another form of art. The work is done to present an idea which can be photographed and written about, but it does not have to live on in its original form. Most of us have never seen the cave paintings in France, and few people have seen the Mona Lisa, or a Rembrandt. We only see pictures of them, yet most of us know about these works and appreciate them.

Yet we're conditioned to think that for something to be art, it must be precious and permanent. If a painting is on stretcher bars or if it's in a period frame with a light over it and somebody says "this is a work of art," we can accept that.

Take people into a science lab and show them an experiment going on and they'll say "well, I don't know what you're doing and I don't understand it but I just know something grand will come of it." But if they walk into an art studio they will be very critical of any research or anything that's new. They want it authenticated by an art historian and they want a dollar sign on it. It takes people a long time to accept new ideas in art. The old clichés are "my five-year-old child could do that" and "I don't know much about art, but I know what I like." We need to have more people become aware of what's going on in the art world and be more open and accepting.

Walter H. Munk

Professor of Geophysics

Walter H. Munk has become an integral element in the operation and direction of Scripps Institution of Oceanography because of his long association with the institution and his outstanding scientific contributions in geophysics and planetary physics. He came to the campus as a graduate student in the mid-1940s and has served as a professor since his graduation in 1947. The primary organizer behind the UC Institute of Geophysics and Planetary Physics, he was named as the institute's director of the La Jolla labs in 1959.

The recipient of numerous scientific awards, Munk is considered by many of his colleagues as one of the world's foremost oceanographers. When he was awarded the citation for the 1969 California Scientist of the Year, it was written, "His experimental and theoretical studies of ocean waves, large and small, have deepened our understanding of the beauty and mechanism of the ocean and the earth. His mathematical techniques and new instruments have pushed back the darkness and brought nearer the utilization of the resources of the sea."

Born in Vienna, Austria, in 1917, Munk received his B.S. and M.S. degrees from the California Institute of Technology, in 1939 and 1940, respectively.



"Sources of energy such as tides, waves, temperature differentials, currents, the major ways people talk about energy from the sea, will make very minor contributions from the point of view of the total need of energy."

Q: As a physical oceanographer, your concerns encompass such phenomena as currents, tides, water temperature, and the like. How would you describe the state of physical oceanography?

A: I would characterize the past hundred years of oceanography as a century of great exploration with very poor sampling. Sampling is a word that has a definite meaning to scientists in that if you sample a field in either space or time you have to do it at a certain prerequisite density in order to define the field being measured. If you sample here and there, you don't really understand what the field is like.

Scientists have grossly undersampled the oceans. We have recorded things at such intervals in time and space that the field that we have measured has really not been properly defined.

The use of satellites in oceanography will give us the possibility, which we have never had working from expedition ships, to sample adequately. Satellite sensors will define the ocean surface in a significant way over significant periods of time. As a result of some of the data we are collecting by satellite, we are finding that certain descriptions people have made of the ocean are not only inaccurate, but totally wrong.

The basic measurements of tempera-

"The basic measurements of temperature, salinity, sea-level height, and other ocean features have never been adequately recorded from ships, and the satellite will give a platform in space from which to do sampling properly."

ture, salinity, sea-level height, and other ocean features have never been adequately recorded from ships, and the satellite will give a platform in space from which to do sampling properly.

Q: Many people look to the oceans as sources of great potential in supplying food and energy for the future. What are your views on this?

A: An important point is that the oceans aren't a limitless source of protein and other food materials. It doesn't look as if major attempts to increase the production of food would do more than double or triple the amount of food from the oceans. The contribution will be significant, but not limitless.

As for energy from the sea, I don't think it is viewed as a principal source of power for our energy problems. Sources of energy such as tides, waves, temperature differentials, currents, the major ways people talk about energy from the sea, will make very minor contributions from the point of view of the total need of energy. Of course, if we consider oil beneath the seafloor as oceanography, it will continue to be a major source. But these rather exotic means that are being explored in the oceans are not going to solve the energy problem.

Q: How did you become interested in marine sciences and oceanography?

A: When I was a senior at Cal Tech I met a girl who lived in La Jolla and who was planning to spend the summer at her home. I decided to look for a job in La Jolla so I could see her. At the time, there weren't many places to work in the area and someone suggested I try to get a position at Scripps. At the time, I recall, I didn't even know oceanography existed, but I was accepted and became a visiting scientist for \$50 a month during the summer vacation. The young lady has long since returned to her family's home in Dallas, and I'm still here.

Then I took a year of graduate school at Cal Tech, but by then I made up my mind to continue work in oceanography. My master's thesis was on a subject in oceanography and upon completion of the work, I returned to Scripps to ask if I could become a student. Harold Sverdrup, who was a great physical oceanographer and who later became my teacher and mentor, was director of Scripps then. When I told him of my interest to become a student and have a career in oceanography, he said, "I am pleased you would want to do so, but I can't think of a single job that will become available in the next ten years." So I said, "Fine, I'll accept that."

Ever since, there have been more opportunities and things to do than I have time to consider.

Q: What recommendations would you make to an undergraduate who is interested in pursuing education and a career in oceanography?

A: He or she should learn a discipline well, whether it is biology, chemistry, physics, or geology. First learn the fundamentals, and read some about oceanography, but I wouldn't recommend undergraduate courses in oceanography as they are not necessary for graduate work. We have found that it is preferable that young people work on the fundamentals during their undergraduate years, and then go out and pound on the doors of the oceanographic institutions to make sure their interests are known.

Students should be encouraged to do what they want during their undergraduate years, not what is fashionable or what the job market wants now, which will be out of date by the time they are through with their education. They ought to do what they want to do and hope their timing to enter the job market will be reasonably good.

Kristin Luker

Assistant Professor of Sociology

"It's important to understand that we all react to certain dynamics in our society. Maybe this is utopian, but if people can understand some of the forces that are working in their lives, they may be able to have a little more control over their environment."

While working as a volunteer in a Planned Parenthood clinic, Kristin Luker observed that many of the women coming to the center for abortions were middle-class women who, for all appearances, were educated and well-informed. Luker wondered why these women were becoming pregnant, when contraception was so readily available to them.

Her curiosity led to an extensive study which resulted in her first book, Taking Chances. She developed a theory about the phenomenon, which she calls "contraceptive risk-taking," concluding that for a variety of reasons, many women opt to ignore birth control and then turn to abortion when they become pregnant.

Luker now is researching a second book about the emotions behind the abortion issue. In her field, the sociology of reproductive behavior, Luker has found that her subjects often have passionate convictions on each side of an argument. It is the volatility of the issues which piques Luker's interest, since she is mainly concerned with the basis of peoples' thoughts and actions.

"The people I admire most are the ones who have really complex views of the world, the ones who recognize that an issue is complicated, but who in the long run feel that their view is the most useful, accurate and moral," she says.

Q: Why did you choose sociology as your profession?

A: I grew up moving every few years and living in foreign countries, and so I was always something of an outsider. Even in America, each different community had its own rules and special

way of interacting. I would always try to figure out why people behaved the way they did, why they thought the way they did.

As an undergraduate at Berkeley, I thought I wanted to be a psychology major. I took one of those "rat" courses that was required of psychology majors and I got the first C I had ever gotten in my entire life. I was also taking sociology, and I was getting more and more excited by it. Suddenly, there was a profession, a discipline, that thought about reality the way I thought about reality.

I became a demographer, and I am still interested in population studies. Lately, I have moved away from what demographers traditionally study to social demography, which is the study of what motivates people to do what they do.

For example, some-

thing that I find quite interesting is how emotional cigarette smoking has become. Here we have an issue that was big in the nineteenth century, when smoking was thought to be a filthy habit and states passed laws against it. Then

the issue fell into quietude for a long time. Now, it has become a major issue once again. I am fascinated

that there is a political organization that lobbies against smoking now, and I'm curious about why it didn't become a heated issue until some ten to fifteen years after the surgeon general's report, which showed smoking was bad for your health.

Q: What is your role as a sociologist? Is it to research and



"Also, if we are coming upon an era of limits, as Jerry Brown calls it, then I think it is going to be a very interesting and very complicated time because it is difficult to take publicly funded services away from people."

document patterns, or to look for the reasons these patterns develop?

A: I think it is very important to figure out why things happen. I try to see both sides of an issue and suggest that each side on an issue often becomes blinded to the other's realities. Then I try to present this information so the reader can see positions on both sides. It's important to understand that we all react to certain dynamics in our society. Maybe this is utopian, but if people can understand some of the forces that are working in their lives, they may be able to have a little more control over their environment.

Q: As we enter a new decade, what kinds of trends do you see?

A: The sixties and seventies were times of affluence, and I think that the state of the economy today is leading to cultural and social conservatism. If jobs are easy to find, then you feel free to wear your hair long and show up at work in jeans . . . So what if you get fired? You can always get another job down the street. Now, people feel less secure about their jobs and their economic status, and it's leading to a sense of constriction of social and cultural opportunities as well. I don't find it surprising that people are cutting their hair

shorter and are more worried about grades or jobs.

Also, if we are coming upon an era of limits, as Jerry Brown calls it, then I think it is going to be a very interesting and very complicated time because it is difficult to take publicly funded services away from people. In the 1960s, our society made certain commitments. We came to feel that people had a *right* to public education, health, and a certain minimum standard of living. If there is going to be the severe scarcity that many seem to be predicting, I foresee an era of very troubling conflict where groups fight it out over a shrinking set of resources.

Standish Lawder

Associate Professor of Visual Arts

"In film, when you see a street receding into the background, you know in your mind that you're looking down a flat plane and at an image. In stereoscopic film, when you look down at a three-dimensional image of a road, you have no doubt that you can walk down that road."



A visitor to Standish Lawder's studio will not find paints or easels or the other tools of the conventional artist. Lawder's canvas is the screen on which he projects the films which are his works of art.

His workshop is strewn with gadgets. Wires, switches, and mechanical devices are clues that the work being done here is highly technical. Mounted on a tall platform is his current project: a projector that eventually will show the stereoscopic films that Lawder creates.

Lawder's first films were made in the basement of his home in New Haven. As a student and then as a faculty member at Yale University, he created a large body of experimental films which is recognized as a significant contribution to the growing medium of film as art.

Lawder considers his films to be an extension of traditional art, with the framed image put to motion and pushed through time to create cinematic imagery. Through stereoscopic film, Lawder hopes to add a third dimension to his work.

Q: Have you always been interested in film?

A: I have been interested since I was young in science, medicine, mechanics, optics, and natural phenomena. My course work in college was predominantly premed, and then I discovered something called "art," so I was an art major, while still carrying a full premed schedule.

I went to Yale and did a master's thesis on Bavarian baroque architecture and decided to take it no further than that, because the Germans had

"I'm going one step further and extending painting into movement through time and space. I'm getting a fascinating set of experimental variables in terms of wonderful, startling, and unbelievable manipulations of objects in space, size, and scale."

the field pretty well covered. My passion was, and is, twentieth-century art, and I was shopping around for a dissertation topic when I realized that there was an enormous body of material that was part-and-parcel of the history of modern art. No art historian had looked at this material because it was not paint on canvas, it was images on moving film. I did my graduate work on this: film as modern art.

Film is so fascinating and so seductive that almost anyone who gets very close to it, even from a scholarly point of view, wants to become involved and produce it. I started making films when I was doing my graduate work, and I've been making films ever since. We all know what film is, its magic and how it works. But there is also an area into which film can be pushed and that is the third dimension, through 3-D, or stereoscopic film. As I began to experiment and explore stereoscopic film, I found there was not adequate filming equipment, so my project has become to design and assemble a technically perfected stereoscopic motion picture system.

Q: What is stereoscopic film?

A: Stereoscopic film is a visual phenomenon which produces a sensation that is kinesthetic and powerfully physical, more like animated light sculpture than like film. It gives you the

eerie sensation that you are physically there. In film, when you see a street receding into the background, you know in your mind that you're looking down a flat plane and at an image. In stereoscopic film, when you look down at a three-dimensional image of a road, you have no doubt that you can walk down that road.

I expect my work in stereoscopic film to come out of a tradition of thinking as a painter; that is, thinking of the screen as a substitute for the canvas. I'm going one step further and extending painting into movement through time and space. I'm getting a fascinating set of experimental variables in terms of wonderful, startling, and unbelievable manipulations of objects in space, size, and scale.

Q: What do you see in the future for your project and for film in general?

A: My work is very critically dependent on technical developments, and more and more what we're going to see in expanded moving imagery depends on technical developments. For example, on the drawing boards now are wafer-thin liquid crystal visual display systems that can be read as flat-screen video monitors that are no more than an inch thick. These crystals are neither film nor video; they are a new technology.

We're going to see richer, more complex, and larger images and an increasing sophistication of our arsenal of techniques as a result of these technological advancements. We've already seen this in films such as *Star Wars* which are 90 percent computer-controlled special effects. These kinds of films would have been technically impossible to make ten years ago.

I think we're also going to find an increasing development of what can best be called private or semi-private screening situations. One example of that which is already taking place is projected video, where you can watch football games in bars on four-foot screens. It is not going to be long before those screens are in every living room in the country. Film cameras on the market now are so totally automated that they are no more complicated to use than aiming a water pistol at someone, and video is becoming more available for do-it-yourself movies.

We have no idea at this point what is coming or what is possible, and I think we're in for some wonderful surprises. I wouldn't trade this time for any other in the history of art. As an artist, what I find most exciting about my work and related work is that it represents a virgin art. Work which is being done now will allow us to experience sensations and create illusions that have never been possible before.

Roger Reynolds

Professor of Music

Chairman of the Department of Music

"People here are concerned with making new materials rather than disseminating old materials. Can you imagine a physicist being content with teaching Newton's laws? Yet somehow we think of music as stopping somewhere back with the classics."

Roger Reynolds, a prolific and widely honored composer, toured for several years as a performer in Europe, Japan, and the United States before joining the UC San Diego faculty.

Because of his commitment to the exploration of new musical techniques, Reynolds set about to acquire funding on behalf of the university for a center where he and his colleagues could pursue their creative projects. Today at the Center for Music Experiment (CME), some of the most active and innovative artists in the contemporary music world meet to work and to share their efforts with the public.

Currently, Reynolds is working to establish a modern computer system on campus, a system specifically designed for musical purposes.

"Musicians must learn more now than was previously necessary in order to make music," Reynolds says. "Technology has made music a more demanding and complex procedure than ever before."

Q: Why did you become a composer rather than a performer?

A: I turned to composition as an act of outrage. I had graduated from the University of Michigan with a degree in engineering physics and I went back for a degree in music. I was outraged that all of the students around me were per-

forming music of older times by foreign composers.

The scientists who originally formed this campus had the remarkable good sense to make sure that the arts departments were composed of practitioners.

There are parallels between the arts and sciences. People here are concerned with making new materials rather than disseminating old materials. Can you imagine a physicist being content with teaching Newton's laws? Yet



"Technology . . . has had an impact on us through amplification . . . now a group of five performers can have an impact on 100,000 people. A small group of individuals can control with the subtlety of a chamber ensemble an effect which is bigger than that achieved by a large orchestra."

somehow we think of music as stopping somewhere back with the classics.

Q: How is music today different from music of past centuries?

A: In the West, we've had the idea that an instrument or voice should produce a uniformly smooth and well-matched set of tones, from its lowest to its highest register. But, if you listen, for example, to Japanese music, the scale on the bamboo flute is very irregular. Each pitch has its own acoustic quality, a different timbre, a different color, almost as though it has been produced by a different instrument. The Japanese performer or composer enjoys that lack of homogeneity and uses it. In the West, we are becoming more aware of the fact that instruments which exist now can produce a far wider range of sounds than we used to think was proper.

Another major and quite unique impact that has been made on music in this century is electronics. Technology is allowing us to store natural sound, to alter and enhance it. Certainly in the

next decade our home music industry is going to be dominated by digital equipment; records which will be read by, let's say, a laser beam instead of a needle, and the laser doesn't produce wear.

Technology also has had an impact on us through amplification. It used to be necessary if you were a Berlioz, to have an orchestra, a band, several choruses, and soloists spread around the auditorium to have the kind of effect that you wanted. But now, a group of five performers can have an impact on 100,000 people. A small group of individuals can control with the subtlety of a chamber ensemble an effect which is bigger than that achieved by a large orchestra. You could take a vocal quartet, for example, amplify and multiply (by computer processing) the actions of the soprano so that she sounds like a chorus of sopranos. This sort of thing can be done live and with stunning control; the potential is clear, and I think it will be done in the next decade.

Q: What is the potential for using the computer as an instrument?

A: In the past, computers have not been used for musical purposes, but in the last couple of years some very exciting doors have opened. Over the past decade, musicians who worked with computers were metaphorically in the position of a pianist who would strike a chord and wait until the next day to hear it. Now we have the possibility of continuous and direct interaction with the computer, so a musician can tune and refine the sound immediately. That's going to produce in the eighties an enormous expansion of the range of sound materials with which a composer can easily work.

Performers and composers also will be working live with computers on stage, so a concert will not be a sterile situation where a few reels are turning and sounds are emerging. With the use of a combination of projected images and sounds, one sees in the eighties the possibilities of a very rich, and powerful experience: human performers interactive with technology.





VIEW

Choosing a College at UC San Diego

As a member of the nine-campus family of the University of California, UC San Diego is a full-fledged university in every sense of the term. 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. UC San Diego's Scripps Institution of Oceanography is world-renowned in its field, and the university's relatively new School of Medicine already has won national distinction for the quality of its scholarship. UC San Diego's undergraduate programs also have been singled out for special honors in national surveys, despite the comparative youth of UC San Diego as a general campus.

So UC San Diego is, first and foremost, a university. There is one feature, however, which sets this campus apart from most large universities in California and elsewhere: the "small-college" concept, patterned after the model so successfully pioneered, centuries ago, by Oxford and Cambridge.

Separate colleges may be found on many American university campuses, but these are designed usually to serve specific disciplines

— a college of engineering, a college of agriculture, a college of business administration, and the like.

At UC San Diego, however, every major is available to all qualified undergraduates and with few exceptions is equally accessible to every student without regard to the student's college affiliation. As a consequence, your choice of college will depend, in nearly every case, not on the major you wish to study but on your preference among the styles and patterns of the colleges' general-education and degree requirements and goals.

Early in the planning of UC San Diego, it was recognized that many students learn more, and achieve greater personal satisfaction, when they are academically and socially affiliated with a relatively small group of faculty and fellow students. The planners also understood that there are many advantages to "bigness" in a university: a faculty of international renown, first rate teaching and research facilities, laboratories, and libraries. A new arrangement had to be created, one which combined not only the best of a large research

university with that of a small liberal arts college, but also one which would be responsive to the diversity of opinions on what general education should be, what missions should higher education have, and so forth. The planners asked themselves how UC San Diego would best meet its responsibilities to serve the people of California and organize its undergraduate program most effectively to accommodate — indeed encourage — a diversity of educational interests and philosophies.

The answer was the San Diego 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 College in 1964. Three more colleges — John Muir, Third, and Earl Warren — have since been established. Because each has its own distinctive characteristics, you may choose from a variety of educational philosophies and environments in selecting the program best suited to your personal goals.

REVELLE EDUCATIONAL PHILOSOPHY

The faculty of Revelle College believes firmly in providing the students with a true liberal arts education. Designed into the curriculum are well-defined general education requirements in writing, humanities, social sciences, mathematics, physical and biological sciences, fine arts, and foreign language. These lower-division courses are structured and rigorous, to assure that the student acquires rudimentary knowledge in most major fields of human endeavor. In addition, six more courses are required in an area unrelated to the student's chosen major, to give him or her deeper understanding and appreciation of subject matters outside the intended profession. This rather traditional educational philosophy receives strong support from the students, parents, and alumni, who share a common sense of pride knowing that to graduate from Revelle College means to have acquired reasonable competence in the humanities, social sciences, and natural sciences. The student is now well prepared to meet other varied challenges of life.

MUIR EDUCATIONAL PHILOSOPHY

Students at John Muir College maintain that it is distinguished by its atmosphere of friendliness and informality, which involves much concern for the rights and welfare of others. This goes well with its educational philosophy and requirements, which stress individual choice and development while assuring breadth and depth in learning. Such an atmosphere, combining freedom with responsibility, has helped to make Muir the largest of the colleges.

Under Muir's general education requirements, each student is required to complete four year-long sequences (three courses each).

The sequences are selected from among six general categories, within which are a wide variety of choices. Under such a plan Muir students are offered both diversity and academic scope and excellence.

THIRD EDUCATIONAL PHILOSOPHY

The Third College educational philosophy is based on the belief that the best preparation for a complex and rapidly changing world is a broad liberal education complemented by in-depth study in areas of the students' own choice based on individual academic interests and career goals. This educational approach has several major advantages which students find very beneficial:

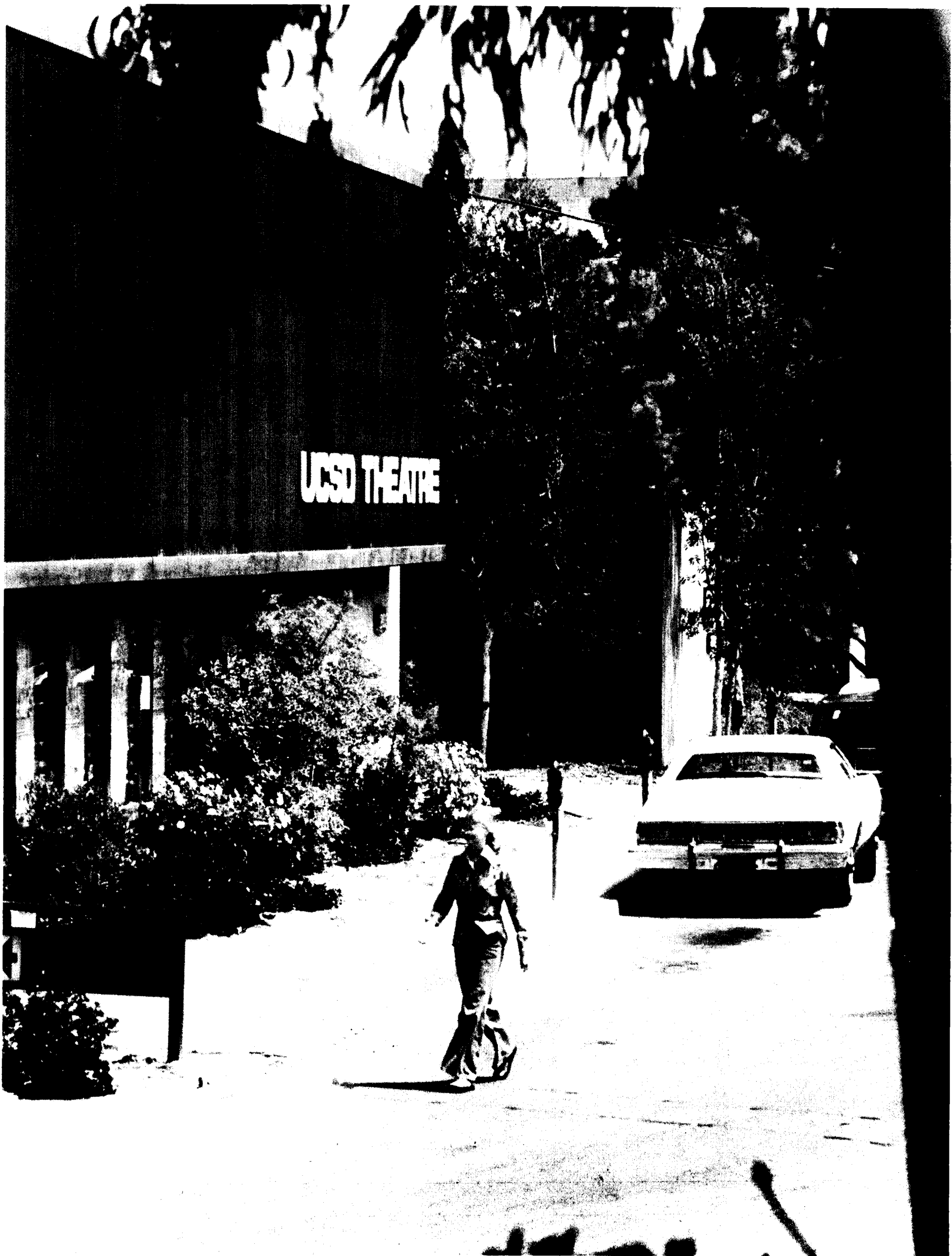
1. Guarantees a basic understanding of the principal branches of knowledge: humanities and arts, social sciences and the natural sciences and mathematics.
2. Provides the flexibility to enable students who have well-defined major interests and career goals to begin work on their majors as freshmen.
3. Provides a structure which guides students who have not decided on a major to sample an array of potential majors while

simultaneously satisfying the graduation requirements of the college.

WARREN EDUCATIONAL PHILOSOPHY

Warren College emphasizes curricula and programs that assist students in making a close connection between their undergraduate education and their career goals. This is true for students with all aspirations; the professions, the arts, etc. The Warren curriculum gives the student a wide range of options, but once the student has selected areas of interest, somewhat more specialization within those areas is required than in the other colleges. All students must take two courses in writing, two courses in symbolic skills (calculus, computer science, or symbolic logic), a major and two minors. These courses give students both a fundamental background and specialization in three areas. By choosing an appropriate major and minors, students can make a significant connection between their undergraduate education and their career goals. The college offers academic internships and career-life planning programs for students who wish to sharpen their skills and test their choices.





Revelle College



Revelle College, the first college on the UC San Diego campus, was named in honor of Dr. Roger Revelle, former university-wide dean of research, and for many years director of UC San Diego'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.

The Educational Philosophy

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 of 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 one-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' upper-division years (junior and senior), 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 in the graduate division.

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 a substantial fraction of course 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

Revelle College students are required to demonstrate an acceptable level of basic knowledge in the humanities, fine arts, social sciences, language, mathematics, and the physical and biological sciences.

Students are encouraged to meet the general-education requirements and the requirements of the major and minor 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 Subject A requirement.
2. A three-course sequence in an interdisciplinary humanities program including three laboratories in writing and rhetoric.
3. One course in the fine arts.
4. Three lower-division courses in the social sciences (at least two of the courses must be in one social science sequence).
5. Three additional courses to be selected from the humanities or social science sequences.
6. Three courses in mathematics (three quarters of calculus).
7. Five courses in the physical and biological sciences to include four quarters of physics and chemistry and one quarter of biology.
8. Verbal and reading proficiency in a modern foreign language or successful completion of a modern or classical language course approved for this requirement.

1. Subject A

Satisfaction of the university requirement in Subject A. (See "Undergraduate Registration and Academic Regulations" and "Humanities".)

2. Humanities

The purposes of the general-educational 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 three courses, in sequence, of the interdisciplinary humanities program offered by the Departments of History, Literature, and Philosophy, which focus on some of the great documents of civilizations. Either Humanities 10A-B-C, 11A-B-C, or 12A-B-C is taken in the freshman year. In addition, laboratories in writing and rhetoric are taken in conjunction with the sequence. Writing laboratory sections are organized to give students experience in several rhetorical strategies as well as to give students training and practice in the preparation and critique of expository essays relevant to the materials studied concurrently in the humanities portion of the course. Completing either of these sequences (with a "C" grade in each course) satisfies the Subject A requirement for students who have not otherwise satisfied it. Additional attention is given to those students who enter Revelle College with a Subject A deficiency.

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 drama, music, or visual arts. (See "Courses, Curricula, and Programs of Instruction.")

4. Social Sciences

Three lower-division courses in the social sciences are required for the bachelor's degree. Students will choose three lower-division courses offered by the Departments of Anthropology, Economics, Linguistics, Political Science, Psychology, or Sociology. At least two of the courses must be in one social science sequence.

5. Additional Three-Course Requirement in Either Humanities or Social Science

In addition to completing the three-course humanities requirement and the three-course social science requirement, a student must take three additional courses in humanities or social sciences. Science majors will probably elect to complete the additional humanities/social science requirement in the junior year in order to allow for science laboratories in the sophomore year. Students must select these additional courses in one of the following ways:

- A. Three courses in one humanities sequence of three courses in one of the approved sequences in literature, history, philosophy, music, drama, or visual arts.

OR

- B. Three courses in a social science sequence which, when combined with the first social science requirement, meet one of these patterns:

1. Six courses, three each, in two different social science departments (3-3)

OR

2. Six courses, two each, in three different social science departments (2-2-2).

6. 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 course 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 and college preparation in mathematics 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. (See "Courses, Curricula, and Programs of Instruction: Mathematics.")

7. 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 SHOULD CHECK CAREFULLY THE "COURSES,

CURRICULA, AND PROGRAMS OF INSTRUCTION" SECTION FOR PREPARATION FOR THE MAJOR.

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 5A-B, Chemistry 6A-B-C, and Chemistry 7A-B, and accompanying laboratory courses Chemistry 8AL-BL. The Department of Physics offers three calculus based courses: Physics 1A-B-C, Physics 2A-B-C-D, and Physics 3A-B-C-D. There are also corresponding laboratory courses. The Department of Biology offers Biology 1 to meet the Revelle biology requirement, and also Biology 2 and 3 for those who wish to take more lower-division biology. (See "Courses, Curricula, and Programs of Instruction: Chemistry, Physics, and Biology" for details.)

Continuing students should see "Courses, Curricula, and Programs of Instruction: Natural Sciences" on the renumbering of natural science courses.

8. Foreign Language

Requirements are in terms of levels of proficiency that must be attained by the student, rather than

only in terms of a certain course or number of courses that must be passed. Proficiency may be attained in any modern foreign or classical language. Modern foreign language programs are currently offered in Chinese, French, German, Hebrew, Italian, Russian, and Spanish, and classical language programs are offered in Greek and Latin. Students who have preparation in other languages should see the Office of the Revelle Provost. The language requirement may be satisfied by one of the following:

- a. Demonstration of oral proficiency and a satisfactory score in a standard language examination.
- b. Successful completion of Language/Chinese 64-65-66 or Language/French, German, Russian, Spanish 4-5-6.
- c. A passing grade in Literature/French 10, Literature/German 10, Literature/Greek 100, Literature/Hebrew 52, Literature/Italian 100, Literature/Latin 100, Literature/Russian 10, or Literature/Spanish 10.

The normal preparation for lower-division language proficiency will be language courses in the

FRESHMAN YEAR

FALL

Humanities 10A, 11A, or 12A
Foreign Language
Mathematics
Natural Science

WINTER

Humanities 10B, 11B, 12B
Foreign Language
Mathematics
Natural Science

SPRING

Humanities 10C, 11C, 12C
Foreign Language
Mathematics
Natural Science

SOPHOMORE YEAR

FALL

Natural Science
Social Science
*Humanities or Social Science
Foreign Language

WINTER

Natural Science
Social Science
*Humanities or Social Science
Elective

SPRING

Fine Arts
Social Science
*Humanities or Social Science
Elective

*Science majors may want to take the additional Humanities/Social Science requirement in the junior year to allow time for additional science laboratories and/or mathematics

student's freshman year. With normal high school preparation in language most students will require about a year of course work to prepare for the examination, but some students will take less time and some more, because of differences in ability, industry, and previous language work in high school, on other campuses, or in informal extracurricular activities (e.g., foreign movies, language clubs, language tables) involving the language.

To assist students in attaining the required language proficiencies in French, German, Russian, and Spanish, three special kinds of aid are offered:

- a. Self-instructional materials and equipment, which students can use to advance their proficiency at their own optimum speed.
- b. A program of small tutorial classes, conducted by native speakers of the language.
- c. Instruction by linguistic scientists about language and the learning of languages. This instruction is intended to broaden the scope of students' education as well as to assist them in their own language study.

The Major

All undergraduate majors offered at UC San Diego are available to Revelle College students. A major shall consist of not less than twelve nor more than fifteen upper-division courses, except that a departmental major may be increased by three additional upper-division courses in related electives.

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 approved by the provost, plan his or her own major. The individual major must 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 shall 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.

Restricted Electives

In addition to the major requirements, departments may require a student to pass a number of courses in his or her general area of learning. The requirement is intended to give breadth as well as depth to the student's major. The major program and related elective choices may total up to eighteen courses in the upper-division.

Noncontiguous Courses

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. Each department will designate a minor adviser. Minor programs are subject to approval by the provost. The requirement may be met in one of the following ways:

- a) *Departmental 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.

- b) *Project Minor* — A project minor centers on a problem 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.)
- c) *Six Electives Unrelated to the Major* — Under this option, a student is free to elect any six courses for which the student 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.

The Graduation Requirements

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

1. Satisfy the University of California requirement in American History and Institutions, (See "Undergraduate Admissions, Policies and Procedures: American History and Institutions.")
2. Satisfy the general-education requirements (including Subject A).
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. or 192 quarter-units for the B.S. in engineering.
6. Attain a C average (2.0) or better in all work attempted in the University of California (exclusive

of University Extension).
Departments may require a C average in all upper-division courses and/or a grade of C in specific courses used on the major.

7. Meet the senior residence requirement. (See "Undergraduate Registration and Academic Regulations: Senior Residence.")

Upon satisfaction of the graduation requirements, Revelle College will recommend that the student be awarded the degree Bachelor of Arts or the degree Bachelor of Science in designated engineering programs.

Honors in Revelle College

Provost's honors will be awarded each quarter to students who complete the previous quarter's program with distinction according to criteria established by the Executive Committee of the college.

The Executive Committee of Revelle College will award College Honors with the bachelor's degree to students with a superior overall

grade-point average at graduation. The honors designations are *cum laude*, *magna cum laude*, *summa cum laude*. To be eligible for college honors a student must have completed at least twenty courses (eighty quarter-units) at the University of California. Honors earned will be recorded on each student's diploma.

Phi Beta Kappa Society

The Phi Beta Kappa Society is a national honorary society, originally founded at the College of William and Mary in 1776, in which membership is conferred for high scholastic standing. Membership is determined by vote of the chapter according to students' scholarship records. Revelle students are advised that among the minimum requirements for election to this society are the demonstration of knowledge of a foreign language and a college-level quantitative science such as mathematics.

Transfer Students

Transfer students accepted by Revelle College will, in general, be

held to the general-education requirements and the lower-division prerequisites for a major. The general-education requirements, however, will be interpreted in a manner which considers the student's total educational program. The provost, in consultation with appropriate departments, will evaluate the credentials of each transfer student on an individual basis. Some departments may require a transfer student with senior standing to satisfy a residence requirement within the major department. Students should consult their major advisers about the minimum number of courses required for this purpose.

In order to transfer to Revelle College from another college or school within the University of California, a student will be required to have a C (2.0) average or better on all work attempted at any University of California campus. (See "Undergraduate Admissions, Policies and Procedures: Admission as an Advanced-Standing Applicant.")

The Faculty of Revelle College

NAME	TITLE	DEPARTMENT
Abelson, John N., Ph.D.	Professor	Chemistry
Addison, Michael C., Ph.D.	Professor	Drama
Allison, Henry E., Ph.D.	Professor	Philosophy
Arnold, James R., Ph.D.	Professor	Chemistry
Attiyeh, Richard E., Ph.D.	Professor	Economics
Bada, Jeffrey, Ph.D.	Associate Professor	SIO
Bear, Donald V.T., Ph.D.	Professor	Economics
Behar, Jack, Ph.D.	Associate Professor	Literature
Bishop, Errett A., Ph.D.	Professor	Mathematics
Bond, F. Thomas, Ph.D.	Associate Professor	Chemistry
Bradner, Hugh, Ph.D.	Professor Emeritus	AMES
Brueckner, Keith A., Ph.D.	Professor	Physics
Burbidge, E. Margaret, Ph.D.	Professor	Physics
Burbidge, Geoffrey R., Ph.D.	Professor	Physics
Butler, Warren L., Ph.D.	Professor	Biology

Casalduero, Joaquin, Ph.D.	Professor Emeritus	Literature
Case, Ted J., Ph.D.	Assistant Professor	Biology
Catalan, Diego (M-P), Ph.D.	Professor	Literature
Cespedes, Guillermo, Ph.D.	Professor Emeritus	History
Chen, Joseph Cheng-Yih, Ph.D.	Professor	Physics
Chodorow, Stanley A., Ph.D.	Professor	History
Clark, Leigh B., Ph.D.	Associate Professor	Chemistry
Conlisk, John, Ph.D.	Professor	Economics
Cox, Stephen, Ph.D.	Assistant Professor	Literature
Craig, Harmon, Ph.D.	Professor	SIO
Crowne, David K., Ph.D.	Associate Professor	Literature
Davidson, R. Michael, Ph.D.	Assistant Professor	Literature
Dennis, Edward A., Ph.D.	Associate Professor	Chemistry
Dijkstra, Abraham J., Ph.D.	Associate Professor	Literature
Doolittle, Russell F., Ph.D.	Professor	Chemistry
Dunseath, Thomas K., Ph.D.	Associate Professor	Literature
Edelman, Robert S., Ph.D.	Assistant Professor	History
Elliott, Robert C., Ph.D.	Professor	Literature
Ellis, Albert T., Ph.D.	Professor	AMES
Fahey, Robert C., Ph.D.	Associate Professor	Chemistry
Faulkner, D.J., Ph.D.	Associate Professor	SIO
Feher, George, Ph.D.	Professor	Physics
Firtel, Richard A., Ph.D.	Associate Professor	Biology
FitzGerald, Carl H., Ph.D.	Professor	Mathematics
Frankel, Theodore T., Ph.D.	Professor	Mathematics
Fredkin, Donald R., Ph.D.	Associate Professor	Physics
Freedman, Michael H., Ph.D.	Associate Professor	Mathematics
Friedkin, Morris E., Ph.D.	Professor	Biology
Fung, Yuan-cheng, Ph.D.	Professor	AMES
Garsia, Adriano M., Ph.D.	Professor	Mathematics
Gausch, J. Luis, Ph.D.	Assistant Professor	Economics
Getoor, Ronald K., Ph.D.	Professor	Mathematics
Gibson, Carl H., Ph.D.	Associate Professor	AMES/SIO
Goodkind, John M., Ph.D.	Professor	Physics
Goodman, Murray, Ph.D.	Professor	Chemistry
Gould, Robert J., Ph.D.	Professor	Physics
Green, Melvin H., Ph.D.	Professor	Biology
Grobstein, Clifford, Ph.D.	Professor	Biology
Groves, Theodore, Ph.D.	Professor	Economics
Halkin, Hubert, Ph.D.	Professor	Mathematics
Hamburger, Robert N., M.D.	Professor	Pediatrics
Harrison, Newton A., M.F.A.	Professor	Visual Arts
Hawkins, James W., Ph.D.	Professor	SIO
Hayashi, Masaki, Ph.D.	Professor	Biology

Hegemier, Gilbert A., Ph.D.	Professor	AMES
Heller, Walter P., Ph.D.	Professor	Economics
Holland, Nicholas D., Ph.D.	Professor	SIO
Hooper, John W., Ph.D.	Professor	Economics
Hughes, H. Stuart, Ph.D.	Professor	History
Intaglietta, Marcos, Ph.D.	Professor	AMES
Jackson, Gabriel, Ph.D.	Professor	History
Jolley, Stephen N., Ph.D.	Assistant Professor	Philosophy
Jordan, David K., Ph.D.	Associate Professor	Anthropology
Kamen, Martin D., Ph.D.	Professor Emeritus	Chemistry
Kaplan, Nathan O., Ph.D.	Professor	Chemistry
Kaster, Miriam, Ph.D.	Associate Professor	SIO
Kearns, David R., Ph.D.	Professor	Chemistry
Kohn, Walter, Ph.D.	Professor	Physics
Kraut, Joseph, Ph.D.	Professor	Chemistry
Kroll, Norman M., Ph.D.	Professor	Physics
Langacker, Ronald W., Ph.D.	Professor	Linguistics
Lee, Edward N., Ph.D.	Professor	Philosophy
Lettau, Reinhard, Ph.D.	Professor	Literature
Libby, Paul A., Ph.D.	Professor	AMES
Liebermann, Leonard N., Ph.D.	Professor	Physics
Lijphart, Arend, Ph.D.	Professor	Political Science
Lin, Shao-Chi, Ph.D.	Professor	AMES
Linck, Robert G., Ph.D.	Associate Professor	Chemistry
Livingston, Robert B., M.D.	Professor	Neurosciences
Lonidier, Fred, M.F.A.	Assistant Professor	Visual Arts
Loomis, William F., Jr., Ph.D.	Professor	Biology
Lovberg, Ralph H., Ph.D.	Professor	Physics
Luft, David S., Ph.D.	Associate Professor	History
Lyon, James K., Ph.D.	Professor	Literature
Ma, Shang-keng, Ph.D.	Professor	Physics
Macdougall, J. Douglas, Ph.D.	Assistant Professor	SIO
Machina, Mark J., Ph.D.	Assistant Professor	Economics
Malmberg, John H., Ph.D.	Professor	Physics
Manaster, Alfred B., Ph.D.	Associate Professor	Mathematics
Mandler, Jean M., Ph.D.	Professor	Psychology
Mann, Judith K., Ph.D.	Assistant Professor	Economics
Maple, M. Brian, Ph.D.	Associate Professor	Physics
Marino, John A., Ph.D.	Assistant Professor	History
Marti, Kurt, Ph.D.	Associate Professor	Chemistry
Masek, George E., Ph.D.	Professor	Physics
Matthias, Bernd T., Ph.D.	Professor	Physics
Mayer, Joseph E., Ph.D.	Professor Emeritus	Chemistry

McElroy, William D., Ph.D.	Professor	Biology
McIlwain, Carl E., Ph.D.	Professor	Physics
Meeker, Michael E., Ph.D.	Associate Professor	Anthropology
Mendeloff, John M., Ph.D.	Assistant Professor	Political Science
Miller, David R., Ph.D.	Professor	AMES
Miller, Jeffrey O., Ph.D.	Assistant Professor	Psychology
Miller, Stanley L., Ph.D.	Professor	Chemistry
Montal, S. Maurice, Ph.D.	Professor	Physics/Biology
Montrose, Louis A., Ph.D.	Assistant Professor	Literature
Moore, F. Richard, Ph.D.	Professor	Music
Moore, Stanley W., Ph.D.	Professor Emeritus	Philosophy
Mosshammer, Alden A., Ph.D.	Associate Professor	History
Nachbar, William, Ph.D.	Professor	AMES
Newmark, Leonard D., Ph.D.	Professor	Linguistics
Norman, Donald A., Ph.D.	Professor	Psychology
Olafson, Frederick, A., Ph.D.	Professor	Philosophy
Olfe, Daniel B., Ph.D.	Professor	AMES
Pearce, Roy Harvey, Ph.D.	Professor	Literature
Penner, Stanford S., Ph.D.	Professor	AMES
Perrin, Charles L., Ph.D.	Associate Professor	Chemistry
Peterson, Laurence E., Ph.D.	Professor	Physics
Pfaelzer, Mary J., Ph.D.	Assistant Professor	Literature
Phillips, David P., Ph.D.	Associate Professor	Sociology
Piccioni, Oreste, Ph.D.	Professor	Physics
Pippin, Robert B., Ph.D.	Assistant Professor	Philosophy
Plantamura, Carol, Ph.D.	Assistant Professor	Music
Ramanathan, R., Ph.D.	Professor	Economics
Rand, Sinai, Ph.D.	Associate Professor	AMES
Randel, Fred V., Ph.D.	Associate Professor	Literature
Reissner, M. Erich, Ph.D.	Professor	AMES/Mathematics
Revelle, Roger R., Ph.D.	Professor	Political Science
Rice, John A., Ph.D.	Associate Professor	Mathematics
Roberson, Robert E., Ph.D.	Professor	AMES
Rohrl, Helmut, Ph.D.	Professor	Mathematics
Rumelhart, David E., Ph.D.	Professor	Psychology
Russell, R. Robert, Ph.D.	Professor	Economics
Saltman, Paul D., Ph.D.	Professor	Biology
Saville, Jonathan, Ph.D.	Associate Professor	Literature
Schane, Sanford A., Ph.D.	Professor	Linguistics
Scheffler, Immo E., Ph.D.	Associate Professor	Biology
Schrauzer, Gerhard N., Ph.D.	Professor	Chemistry
Scobie, James R., Ph.D.	Professor	History
Shenk, Norman, Ph.D.	Associate Professor	Mathematics
Shuler, Kurt E., Ph.D.	Professor	Chemistry

Singer, S. Jonathan, Ph.D.	Professor	Biology
Small, Lance W., Ph.D.	Professor	Mathematics
Smith, Donald R., Ph.D.	Associate Professor	Mathematics
Smith, Harding E., Ph.D.	Assistant Professor	Physics
Sorenson, Harold W., Ph.D.	Professor	AMES
Steier, Saul, Ph.D.	Assistant Professor	Literature
Steinmetz, Philip	Assistant Professor	Visual Arts
Stroll, Avrum, Ph.D.	Professor	Philosophy
Strum, Shirley C., Ph.D.	Assistant Professor	Anthropology
Suess, Hans E., Ph.D.	Professor Emeritus	Chemistry
Suhl, Harry, Ph.D.	Professor	Physics
Swanson, Robert A., Ph.D.	Professor	Physics
Sworder, David D., Ph.D.	Professor	AMES
Terras, Audrey A., Ph.D.	Associate Professor	Mathematics
Thierstein, Hans R., Ph.D.	Assistant Professor	SIO
Thompson, William B., Ph.D.	Professor	Physics
Tokuyasu, Kiyoteru, Ph.D.	Professor-in-Residence	Biology
Traylor, Teddy G., Ph.D.	Professor	Chemistry
Tuzin, Donald F., Ph.D.	Associate Professor	Anthropology
Urey, Harold C., Ph.D.	University Professor Emeritus	Chemistry
Van Atta, Charles W., Ph.D.	Professor	AMES/SIO
Vernon, Wayne, Ph.D.	Associate Professor	Physics
Vold, Robert L., Ph.D.	Associate Professor	Chemistry
Walk, Cynthia, Ph.D.	Assistant Professor	Literature
Weare, John H., Ph.D.	Associate Professor	Chemistry
Wenkert, Ernest, Ph.D.	Professor	Chemistry
Wheatley, John C., Ph.D.	Professor	Physics
Wheeler, John C., Ph.D.	Associate Professor	Chemistry
Wierschin, Martin W., Ph.D.	Professor	Literature
Williams, Forman A., Ph.D.	Professor	AMES
Williamson, Stanley G., Ph.D.	Professor	Mathematics
Wilson, Kent R., Ph.D.	Professor	Chemistry
Wilson, Mark L., Ph.D.	Assistant Professor	Philosophy
Wong, David Y., Ph.D.	Professor	Physics
Woo, Chia-Wei, Ph.D.	Professor (Provost, Revelle)	Physics
Wright, Andrew, Ph.D.	Professor	Literature
Xuong, Nguyen-Huu, Ph.D.	Professor	Physics/Biology/Chemistry
Zimm, Bruno H., Ph.D.	Professor	Chemistry
Zweifach, Benjamin W., Ph.D.	Professor	AMES
Hinton, Sam, B.A.	Lecturer * * * *	Literature
Hunt, Howard, Ph.D.	Supervisor	Physical Education
Millenbah, J. Charles, M.A.	Associate Supervisor	Physical Education
Vitale, Frank, M.A.	Supervisor	Physical Education
Waddy, Lawrence, M.A.	Lecturer	Literature

John Muir College



In the fall of 1967, John Muir College, second of the colleges planned for UC San Diego, admitted its first students. The college was named for John Muir, the California naturalist, geologist, and writer. Born in Dunbar, Scotland in 1838, Muir was educated in Scotland and at the University of Wisconsin. He explored the Sierra Nevada Mountains, Alaska, and the Arctic regions and worked for many years in the cause of conservation and the establishment of national parks and forests. His books are still widely read for their vivid and engaging descriptions of the land and the people of early California. Muir made his home in Martinez, California. He was awarded an honorary degree by the University of California in 1913. He died in 1914.

The Character of the College

John Muir College seeks to be an institution of a special kind. First of all, it intends to be an academic community: its members are engaged in inquiry and the sharing of ideas. At the same time a majority of its members are young adults who need to define themselves in relation to the physical world and the society in which they live. Self-discovery, when undertaken in the midst of academic pursuits and opportunities, can be unusually profound and meaningful, especially if learning is truly joined with living, if knowledge gained in the classroom, the library, and the laboratory can in some real way be applied to the experience of the Muir student and the problems of contemporary society.

These are grand intentions. Simply announcing them does not make them so. The connection between learning and living, for example, is not always easy to maintain. Work is needed, and students are expected to share in it. They help to conceive and design new courses. They serve on the

John Muir College Council and the Curriculum Review and Development Board; they are concerned with the general governance of the college and its academic program. They act as house advisers in the residence halls and as discussion leaders in the Contemporary Issues Program. They help to formulate and administer the rules under which they live. They share in the decisions affecting allocations of resources. They are active members of the community.

Appropriately, therefore, the general-education requirements and the curriculum as a whole encourage active rather than passive learning. Active learning necessitates self-education and opportunities for independent study. The major programs provide many forms of this. Those students who choose not to pursue an established major and who qualify for the individually designed major will be expected to complete projects that demand much independent investigation.

The General-Education Requirements

The Muir College general-education program is described as follows:

Each student is required to complete one-year sequences from four of six categories: two from among fine arts, humanities (history, literature, or philosophy), or a foreign language, and two from among mathematical science, natural science, or a social science.

The specific courses composing sequences in the six categories are approved by the Muir College Curriculum Review and Development Board. Each year this board, consisting of faculty and students, determines which of the course offerings of the various departments may be used in the general-education program. The basic criterion is that a year sequence must be a unified and

coherent treatment of a single subject or topic. The following points should be noted.

1. Only complete sequences may be applied to the general-education requirement. Ordinarily an entire sequence is taken in one academic year.
2. More appropriate advanced courses, comparable in content to approved lower-division courses, may, *with prior written consent from the Office of the Provost*, be substituted for those listed.
3. The same sequence may be used both to satisfy part of the general-education program and to meet a departmental requirement or prerequisite.
4. Units obtained from advanced placement may be applied toward the 180 needed for graduation; such examinations *may not be used* to satisfy the general-education requirements.
5. Students should request from the Office of the Provost an up-to-date list of general-education requirements before making their final selection of courses.
6. Courses taken to satisfy the general-education requirement may, in general, be taken for a letter grade or Pass/Not Pass. Muir students are reminded that to take a course Pass/Not Pass, they must be in good standing (2.0 GPA). Please note that there is a limitation of one Pass/Not Pass course per sixteen units. No more than one-fourth of an undergraduate student's total course units counted in satisfaction of degree requirements may be in courses taken on a Pass/Not Pass basis.

This general-education program was established by the faculty of the college to guide the students toward a broad and liberal education while allowing them substantial choice in the development of that education. It should be understood that this

Choosing a College at UC San Diego

freedom carries with it the responsibility on the part of students for careful planning. Almost all of the major programs at UC San Diego 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. Students of the college are encouraged to consult regularly with the academic counselors in the Office of the Provost as well as with members of the faculty concerning the selection of appropriate courses. Some examples of the choice which must be made are given in the paragraph "Major Programs and Special Projects."

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 a subject represented on the approved list will normally be accepted as completing one of the four required sequences. After the Office of Admissions evaluates a student's transcript, the Office of the Provost makes an evaluation of prior work for each student at the time of his or her first enrollment.

Major Programs and Special Projects

Students in Muir College may attempt any major for which they have completed prerequisite courses. It was stated above that many majors have precise and often extensive lower-division prerequisites. This means that students should plan their lower-division work carefully. Since many students change their plans concerning a major, it is often useful to plan with regard to general areas of interest rather than a specific major. Each academic department has, in its section of this catalog, a paragraph entitled "The Major

Program." Students are encouraged to read these carefully, for they indicate both the extent of the prerequisites 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 modern foreign language is required by several departments (e.g., linguistics, literature).
2. Specific science courses are required by many departments. For example, EECS requires Physics 2A-B-C-D or Physics 3A-B-C-D; Chemistry requires Physics 1A-B-C, Physics 2A-B-D, or Physics 3A-B-C-D.
3. The physical and life sciences, applied sciences (EECS and AMES), together with certain of the social sciences (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. A project normally includes both regular course work and independent study as well as a recommended back-up major; taken together, this must represent the same amount of work as an ordinary major. 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 the knowledge and skill acquired. In either case, a regular member of the faculty must serve as adviser to a student doing the project. It should be understood that the demands of a special project 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 provost's Academic Advising Office.

The Graduation Requirements

To receive a Bachelor of Arts or Bachelor of Science degree from John Muir College a student must:

1. Meet the general university requirement in Subject A, English Composition. (See "Undergraduate Admissions, Policies and Procedures.")
2. Satisfy the University of California requirement in American History and Institutions. (See "Undergraduate Admissions, Policies and Procedures.")
3. 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.")
4. Fulfill the general-education requirements described above.
5. Pass forty-five, four-unit academic courses or their equivalent. Eighteen of the forty-five courses must be upper-division level. Departments may require a C average in all upper-division courses and/or a grade of C in specific core courses required for the major.
6. Show some form of concentration and focus of study. Ordinarily this is accomplished by completing a departmental major. Students in the college may attempt any major upon completion of the prerequisites. Students who do not choose to meet this requirement by means of a departmental or interdisciplinary major must complete a special project. As the name implies, this is a specialized form of concentration. It normally consists of a combination of

regular course work and independent study. Each project must be approved by the provost. (See the paragraph "Major Programs and Special Projects," above.)

7. Satisfy the residency requirement that nine of the last eleven courses passed must be taken as a student in the college.

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 a completion of an approved departmental minor on a student's transcript. No course may be used to complete 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 may be taken P/NP (a 199 only).

Upon satisfaction of the graduation requirements, Muir College will recommend the student be awarded the degree of Bachelor of Arts or Bachelor of Science.

Honors in Muir College

Provost's Honors will be awarded each quarter to students who complete the previous quarter's program with distinction.

The college will award honors with the bachelor's degree to students with an exceptional grade-point average in their overall course work.

To be eligible for college honors, a student must have completed at least eighty, graded, quarter-units in the University of California. Only 14 percent of the graduating seniors campus-wide are eligible for college honors.

The honors designations are *cum laude*, *magna cum laude*, and *summa cum laude*. Honors earned will be recorded on each student's diploma.

Phi Beta Kappa Society

The Phi Beta Kappa Society is a national honorary society, originally founded at the College of William and Mary in 1776, in which membership is conferred for high scholastic standing. Membership is determined by vote of the chapter according to students' scholarship records. Muir students are advised that among the minimum requirements for election to this society are the demonstration of knowledge of a foreign language, a year of college-level quantitative science such as calculus, a well-balanced curriculum reflecting the humanities as well as the sciences, and an exceptionally high grade-point average.

The Office of the Provost

The provost of Muir College is the chief administrative officer of the college. He also performs the function of an academic dean. His academic staff is responsible primarily for advising of a general

nature, registering new students at the time of their initial registration, maintaining academic files, monitoring academic progress by way of petitions, degree checks and academic probation, certifying graduation in cooperation with the departments and the Office of the Registrar, administering the Muir-Dartmouth Exchange Program, and providing information about the individualized Muir Special Project Major.

The Office of the Dean

The Office of the Dean of John Muir College performs many different general services. The staff is accustomed to dealing with questions or problems such as assisting students in getting a thorough hearing if they feel they have been treated unfairly by a faculty or staff member; helping students deal with necessary decisions and procedures concerning possible withdrawal from school, prospective careers, applying to graduate and professional schools, and handling legal problems; aiding students in getting involved in student government and other activities; planning and carrying out social, cultural and recreational activities for faculty, students and staff, and many other areas of student concern.

If you are uncertain where to go to get information or help with your problems or concerns, the dean's office staff will be able to help you.



The Faculty of Muir College

NAME	TITLE	DEPARTMENT
Alfvén, Hannes, Ph.D.	Professor Emeritus	EECS
Anderson, Donald W., Ph.D.	Professor	Mathematics
Anderson, Norman, Ph.D.	Professor	Psychology
Anderson, Victor, Ph.D.	Professor	EECS
Antin, David, M.A.	Professor	Visual Arts
Antin, Eleanor, B.A.	Associate Professor	Visual Arts
Bailey, Frederick G., Ph.D.	Professor	Anthropology
Balzano, Gerald, Ph.D.	Assistant Professor	Music
Bender, Edward, Ph.D.	Professor	Mathematics
Berger, Bennett, Ph.D.	Professor	Sociology
Berman, Ronald S., Ph.D.	Professor	Literature
Booker, Henry G., Ph.D.	Professor	EECS
Bowles, Kenneth L., Ph.D.	Professor	EECS
Boynton, Robert, Ph.D.	Professor	Psychology
Bradbury, Jack, Ph.D.	Associate Professor	Biology
Brody, Stuart, Ph.D.	Associate Professor	Biology
Carlsson, Gunnar E., Ph.D.	Assistant Professor	Mathematics
Chen, Matthew, Ph.D.	Associate Professor	Linguistics
Chrispeels, Maarten J., Ph.D.	Professor	Biology
Christmas, Eric C., R.A.D.A.P.	Professor	Drama
Cicerone, Carol, Ph.D.	Assistant Professor	Psychology
Cohen, Alain J.J., Ph.D.	Associate Professor	Literature
Cohen, Harold, D.F.A.	Professor	Visual Arts
Coles, William A., Ph.D.	Associate Professor	EECS
Cornelius, Ann, Ph.D.	Assistant Professor	Political Science
Davisson, Darrell, Ph.D.	Assistant Professor	Visual Arts
deCerteau, Michel, Ph.D.	Professor	Literature
Deutsch, J. Anthony, Ph.D.	Professor	Psychology
Doppelt, Gerald, Ph.D.	Associate Professor	Philosophy
Douglas, Jack D., Ph.D.	Professor	Sociology
duBois, Page A., Ph.D.	Associate Professor	Literature
Ebbesen, Ebbe B., Ph.D.	Associate Professor	Psychology
Elman, Jeffrey L., Ph.D.	Assistant Professor	Linguistics
Erickson, Robert, M.A.	Professor	Music
Evans, John W., M.D., Ph.D.	Professor	Mathematics
Fantino, Edmund J., Ph.D.	Professor	Psychology
Farber, Manny	Professor	Visual Arts
Fillmore, Jay P., Ph.D.	Professor	Mathematics
Francois, Jean-Charles A., Ph.D.	Associate Professor	Music
Friedman, Richard, Ph.D.	Assistant Professor	Literature

Fussell, Edwin S., Ph.D.	Professor	Literature
Gearhart, Suzanne, Ph.D.	Assistant Professor	Literature
Gilpin, Michael, Ph.D.	Associate Professor	Biology
Gragg, William B., Ph.D.	Professor	Mathematics
Graña, Cesar, Ph.D.	Professor	Sociology
Gusfield, Joseph R., Ph.D.	Professor	Sociology
Halpern, Francis R., Ph.D.	Professor	Physics
Harkins, Edward, Ph.D.	Assistant Professor	Music
Helstrom, Carl W., Ph.D.	Professor	EECS
Howden, William, Ph.D.	Associate Professor	EECS
Howell, Stephen H., Ph.D.	Associate Professor	Biology
Jules-Rosette, Bennetta, Ph.D.	Associate Professor	Sociology
Kirkpatrick, Susan, Ph.D.	Associate Professor	Literature
Klima, Edward S., Ph.D.	Professor	Linguistics
Konecni, Vladimir, Ph.D.	Associate Professor	Psychology
Kuroda, Sige-Yuki, Ph.D.	Professor	Linguistics
Ledden, Patrick J., Ph.D.	Lecturer with Security of Employment	Mathematics
Lee, Sing, Ph.D.	Professor	EECS
Levy, Robert I., Ph.D.	Professor	Anthropology
Lewak, George, Ph.D.	Associate Professor	EECS
Lin, James P., Ph.D.	Associate Professor	Mathematics
Luo, Huey-Lin, Ph.D.	Associate Professor	EECS
MacLeod, Donald I.A., Ph.D.	Associate Professor	Psychology
Madsen, Richard, Ph.D.	Assistant Professor	Sociology
Mandler, George, Ph.D.	Professor	Psychology
Masry, Elias, Ph.D.	Professor	EECS
McClelland, James, Ph.D.	Assistant Professor	Psychology
Metzger, Thomas A., Ph.D.	Professor	History
Mills, Stanley E., Ph.D.	Professor	Biology
Mitchell, Allan, Ph.D.	Professor	History
Monteon, Michael P., Ph.D.	Assistant Professor	History
Munsinger, Harry I., Ph.D.	Associate Professor	Psychology
Obeyesekere, Gananath, Ph.D.	Professor	Anthropology
Oesterreicher, Hans K., Ph.D.	Associate Professor	Chemistry
Ogdon, Wilbur L., Ph.D.	Professor	Music
Oliveros, Pauline, A.B.	Professor	Music
Orloff, Marshall J., M.D.	Professor	Surgery
Parrish, Michael E., Ph.D.	Associate Professor	History
Patterson, Patricia A.	Assistant Professor	Visual Arts
Pickowicz, Paul G., Ph.D.	Assistant Professor	History
Price, Paul A., Ph.D.	Associate Professor	Biology

Rands, Bernard, M.M.	Professor	Music
Rommel, Jeffrey B., Ph.D.	Assistant Professor	Mathematics
Reynolds, George S., Ph.D.	Professor	Psychology
Reynolds, Roger, M.M.	Professor	Music
Rickett, Barnaby, Ph.D.	Professor	EECS
Ritchie, Robert C., Ph.D.	Associate Professor	History
Rodin, Burton, Ph.D.	Professor	Mathematics
Rosenblatt, Murray, Ph.D.	Professor	Mathematics
Ross, Lola R., Ph.D.	Associate Professor	Community Medicine Interdisciplinary Sequences
Rotenberg, Manuel, Ph.D.	Professor	EECS
Roth, Moira, Ph.D.	Associate Professor	Visual Arts
Ruiz, Ramón E., Ph.D.	Professor	History
Rumsey, Victor H., D.Eng.	Professor	EECS
Saier, Milton, Ph.D.	Associate Professor	Biology
Sato, Gordon H., Ph.D.	Professor	Biology
Savitch, Walter J., Ph.D.	Associate Professor	EECS
Scanga, Italo, M.A.	Professor	Visual Arts
Scheiber, Harry N., Ph.D.	Professor	History
Schneider, Alan, M.A.	Professor	Drama
Schwartz, Theodore, Ph.D.	Professor	Anthropology
Sharpe, Michael J., Ph.D.	Professor	Mathematics
Silber, John J., Ph.D.	Professor	Music
Sims, James, M.F.A.	Assistant Professor	Drama
Smith, Douglas W., Ph.D.	Associate Professor	Biology
Soulé, Michael E., Ph.D.	Associate Professor	Biology
Spiro, Melford E., Ph.D.	Professor	Anthropology
Spitzer, Nicholas, Ph.D.	Associate Professor	Biology
Stewart, John L., Ph.D.	Professor, Provost of John Muir College	Literature
Swartz, Marc J., Ph.D.	Professor	Anthropology
Tay, William S., Ph.D.	Assistant Professor	Literature
Teilhet, Jehanne H., Ph.D.	Lecturer with Security of Employment	Visual Arts
Terdiman, Richard, Ph.D.	Associate Professor	Literature
Tschirgi, Robert, M.D., Ph.D.	Professor	Neurosciences
Turetzky, Bertram J., M.A.	Professor	Music
Vendler, Zeno, Ph.D.	Professor	Philosophy
Wagner, Arthur, Ph.D.	Professor	Drama
Warschawski, Stefan E., Ph.D.	Professor Emeritus	Mathematics
Wavrik, John J., Ph.D.	Associate Professor	Mathematics
Wayne, Don, Ph.D.	Assistant Professor	Literature
Wesling, Donald T., Ph.D.	Professor	Literature

Williams, Ben A., Ph.D.

Associate Professor

Psychology

Wong, Yen Lu, M.A.

Assistant Professor

Drama

Woodruff, David, Ph.D.

Associate Professor

Biology

Yip, Wai-lim, Ph.D.

Professor

Literature

Associated Faculty

Briggs, David, B.A.

Assistant Supervisor

Physical Education

Cates, John, M.A.

Associate Supervisor

Physical Education

Chase, David A., M.A.

Lecturer

Music

Davis, Murray S., Ph.D.

Lecturer

Sociology

Forbes, Theodore W., Ph.D.

Supervisor

Physical Education

Hamilton, Elizabeth, M.A.

Lecturer

Music

Naveh, Gila O.

Lecturer

Literature

Rokop, Frank J., Ph.D.

Lecturer

Biology

Schwartz, Howard B., Ph.D.

Lecturer

Sociology

Skief, Andrew, M.A.

Associate Supervisor

Physical Education

Stierle, Donald B., Ph.D.

Lecturer

Chemistry

Vehrencamp, Sandra, Ph.D.

Lecturer

Biology

White, James, Ph.D.

Supervisor

Physical Education

Zalk, Kayla K., B.A.

Lecturer

Drama

Honorary Fellows of the College

Hannes Alfvén, *Scientist and Nobel Laureate*

†Georg von Bekesy, *Psychologist and Nobel Laureate*

Ernst Krenek, *Composer*

†Ernest Mandeville, *Philanthropist*

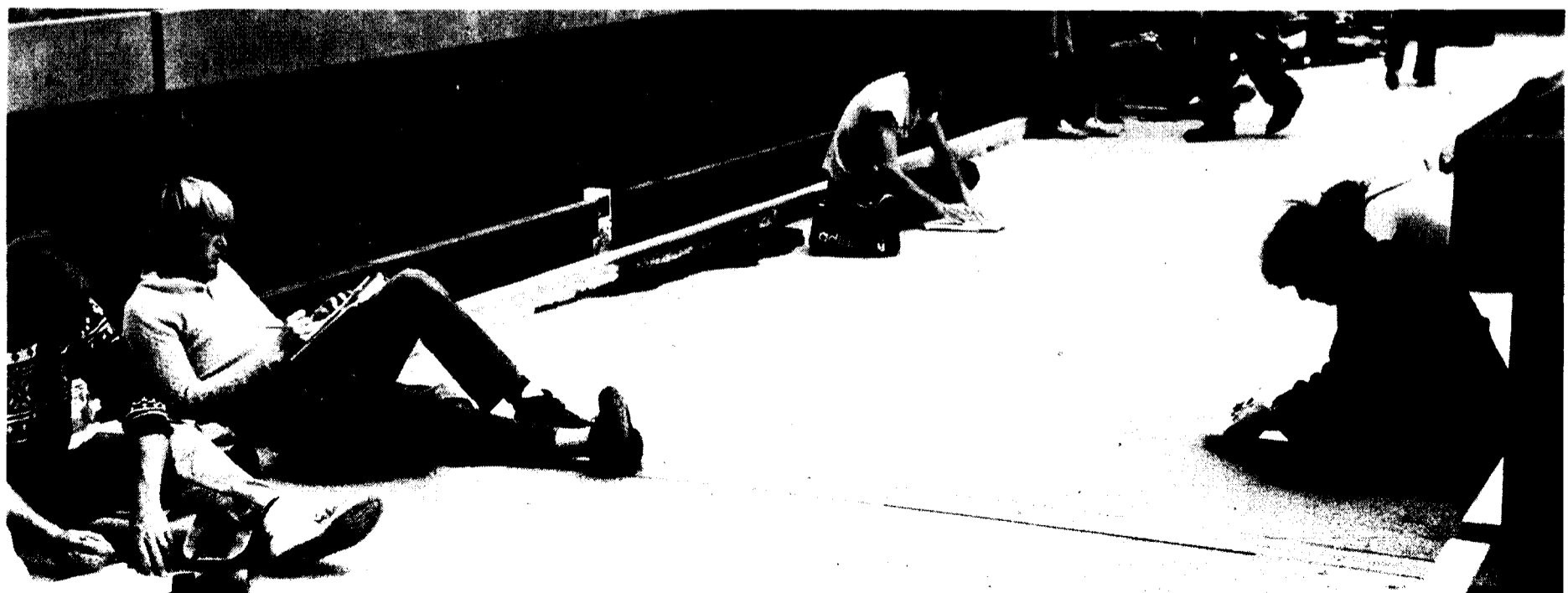
Jonas Salk, *Scientist*

Claude E. Shannon, *Mathematician*

†Earl Warren, *Jurist and Statesman*

Robert Penn Warren, *Poet and Novelist*

†Deceased



Third College



Third College enrolled its first students in the fall of 1970. As a liberal arts and sciences college, its students pursue majors in humanities and arts, social sciences, natural sciences, engineering, and mathematics. Because Third College is guided by the belief that education should not be divorced from the social imperatives of our time, it has a distinctive academic focus on understanding the diverse elements which effect societal change and development and the alleviation of contemporary social problems. Third College is committed to the scholarly investigation and understanding of the factors which determine the quality of life in urban and rural settings in Western and non-Western countries, whether these factors be technological, political, economical, or cultural. From its inception, Third College has been dedicated to the establishment of a multiracial, multicultural academic community.

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

1. Guarantees a basic understanding of the principal branches of knowledge: humanities and arts, social sciences and the natural sciences and mathematics;
2. Provides the flexibility to enable students who have well-defined major interests and career goals to begin work on their majors as freshmen;
3. Provides a structure to guide students who have not decided on a major to sample an array of potential majors while simultaneously satisfying the

graduation requirements of the college.

This educational philosophy finds further expression in our collegiate advising and counseling systems which are designed to enable students to derive full benefit from the rich and diversified academic programs at UC San Diego.

To meet a broad array of student goals, Third College has encouraged and developed academic programs for students who either wish to prepare for graduate and professional schools or employment upon graduation. In terms of the latter, Third College initiated the Teacher Education Program and has pioneered field placement and internship programs to provide students with 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. Probably the best known of these activities are the lecture series and symposia sponsored by Third College.

To insure the best possible academic programs and courses in all disciplines and their proper relation to Third College and its students, Third College has organized its faculty into five course groups and programs: Science and Technology, covering the natural sciences, the applied and engineering sciences, and mathematics; Urban and Rural Studies, covering the social sciences with an urban focus; Third World Studies, covering the humanities and social sciences with an emphasis upon developing countries and minorities within the boundaries of the United States; Communications, covering the social sciences with a focus upon the analysis of communications between individuals, groups and organizations, and mass communications; and the Third College Composition Program. These five course groups and

programs are a primary source of educational innovation and development in Third College.

It is fundamental to the philosophy of Third College that students, faculty, and staff comprise 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, acquisition of a major grant to support minority students in biomedical research by our science faculty, and the close working relationships of faculty, students, and administration in collegiate governance.

The Graduation Requirements

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

1. Satisfy the general university requirement in Subject A, English Composition. (See "Undergraduate Admissions Policies and Procedures.")
2. Satisfy the general university requirement in American History and Institutions. (See "Undergraduate Admissions Policies and Procedures.")
3. Fulfill the general-education requirements described below.
4. Complete a departmental or interdisciplinary major.
5. Satisfy the college residency requirement that thirty-six of the last forty-four units must be taken as a Third College student.
6. Complete and pass a minimum of 180 quarter-units of academic course work with at least a C average. Seventy-two quarter-units of upper-division courses must be completed; at least twelve of the seventy-two quarter-units must be outside of the major discipline.

To receive a Bachelor of Science degree from Third College, a student must comply with requirements 1 through 5 above and satisfy the college requirement

Choosing a College at UC San Diego

of twelve quarter-units of upper-division course work outside of the major field of study. Additionally, the total number of courses must be forty-eight (192 units) of which fifteen (60 units) must be upper-division courses in the major. Presently the Bachelor of Science degree is offered only in the following engineering programs: applied mechanics, bioengineering, chemical engineering, engineering physics, engineering science, computer engineering, electrical engineering, and systems science.

Honors in Third College

The college will award honors with the bachelor's degree to students who have completed at least eighty quarter-units for letter grades at the University of California, San Diego and have achieved a superior overall grade-point average. The levels are designated as *cum laude*, *magna cum laude*, and *summa cum laude*. Honors earned will be recorded on each student's diploma. The criteria for honors are adjusted annually to make approximately 14 percent of the graduating seniors campus-wide eligible for honors.

The college also awards provost's honors to students who complete four consecutive quarters of at least twelve units with a grade-point average of 3.5 or better.

Phi Beta Kappa Society

The Phi Beta Kappa Society is a national honorary society, originally founded at the College of William and Mary in 1776, in which membership is conferred for high scholastic standing. Membership is determined by vote of the chapter according to students' scholarship records. Third College students are advised that among the minimum requirements for election to this society are the demonstration of knowledge of a foreign language and a college-level quantitative science such as mathematics.



Minor

Third College offers an optional minor program which consists of twenty-four units of interrelated course work. A minimum of twelve units must be at the upper-division level. Upper-division courses must be taken for a letter grade. Upper-division courses used for the minor may not overlap with the major. A formal request must be made to the Academic Advising Office and the appropriate department or program.

Language

Third College does not require proficiency in a foreign language as a condition for graduation. However, a given major may require one or more foreign languages. Students should ascertain which foreign language(s), if any, are required for their chosen majors by consulting major programs under the respective departments of instruction. (See "Courses, Curricula, and Programs of Instruction" in this catalog.)

Transfer Students

Transfer students accepted by Third College will, in general, be held to the lower-division general-education requirements and to the lower-division prerequisites for a major. The academic adviser, in consultation with appropriate departments, will evaluate the credentials of each transfer student on an individual basis.

In order to transfer to Third College from another college or school within the University of

California, a student will be required to have a C (2.0) average or better on all work attempted at any University of California campus. (See "Admission to the University: Advanced Standing.")

The General-Education Requirements

The general-education course requirements of Third College are designed to introduce students to the academic focus of Third College as well as to provide a foundation of knowledge from which Third College students may pursue any of the many departmental and interdisciplinary majors offered at UC San Diego.

Students must complete the following set of requirements.

1. Two quarters of composition.
2. Three quarters of societal analysis chosen from three of the following five areas: Communications, Economics, Literature and Society, Third World Studies and Urban and Rural Studies — at least one course must be either in Third World Studies or Literature and Society.
3. Three quarters of natural science: one course each in biology, chemistry, and physics.
4. Two quarters of operative logic — chosen from two of the following three categories: computer science, statistics, or mathematics.
5. Three-quarter sequence of any social science, humanities, or fine arts (excluding studio courses but including foreign languages).

The Majors

Third College students may major in any of the departmental or interdisciplinary majors offered at UC San Diego. For further information and specific details on majors, students should refer to "Courses, Curricula, and Programs of Instruction."

The Faculty of Third College

NAME	TITLE	DEPARTMENT
Appelbe, William F., Ph.D.	Assistant Professor	EECS
Arneson, Richard J., Ph.D.	Assistant Professor	Philosophy
Bellman, Beryl L., Ph.D.	Assistant Professor	Sociology
Blanco, Carlos, Ph.D.	Professor	Literature
Blumberg, Rae Lesser, Ph.D.	Associate Professor	Sociology
Brown, Willie C., Ph.D.	Associate Professor	Biology
Chung, Sandra L., Ph.D.	Assistant Professor	Linguistics
Cole, Michael, Ph.D.	Professor	Psychology
Cooper, Charles, R., Ph.D.	Professor	Literature
Dublin, Thomas, Ph.D.	Assistant Professor	History
Engle, Robert F., Ph.D.	Professor	Economics
Enright, Thomas J., Ph.D.	Associate Professor	Mathematics
Evans, Ronald J., Ph.D.	Assistant Professor	Mathematics
Fortes, P.A. George, M.D., Ph.D.	Associate Professor	Biology
Frazer, William R., Ph.D.	Professor	Physics
Frenk, Margit, Ph.D.	Professor	Literature
Gaffney, Floyd, Ph.D.	Professor	Drama
Garst, Michael E., Ph.D.	Assistant Professor	Chemistry
Gough, David A., Ph.D.	Assistant Professor	AMES
Haff, Leonard R., Ph.D.	Associate Professor	Mathematics
Harper, Elvin, Ph.D.	Associate Professor	Chemistry
Harris, William A., Ph.D.	Assistant Professor	Biology
Heifetz, Robert J., Ph.D.	Associate Professor	Urban and Rural Studies Program
Helinski, Donald R., Ph.D.	Professor	Biology
Helton, John, Ph.D.	Professor	Mathematics
Hu, Te C., Ph.D.	Professor	EECS
Huerta, Jorge A., Ph.D.	Assistant Professor	Drama
Jacobson, Gary C., Ph.D.	Associate Professor	Political Science
Justus, Joyce E., Ph.D.	Lecturer with Security of Employment	Anthropology
Kristan, William B., Jr., Ph.D.	Associate Professor	Biology
Laitin, David D., Ph.D.	Associate Professor	Political Science
Leong, John, Ph.D.	Assistant Professor	Chemistry
Lilien, David M., Ph.D.	Assistant Professor	Economics
Lindenberg, Katja, Ph.D.	Associate Professor	Chemistry
Luco, Juan, Ph.D.	Associate Professor	AMES
Lumpkin, Oscar, Ph.D.	Assistant Professor	Physics

Lytle, Cecil W., B.S.	Associate Professor	Music
McMorris, Trevor C., Ph.D.	Professor	Chemistry
Mehan, Hugh B., Jr., Ph.D.	Associate Professor	Sociology
Mukerji, Chandra, Ph.D.	Assistant Professor	Sociology
Penn, Nolan E., Ph.D.	Professor	Psychiatry
Piñon, Ramon, Jr., Ph.D.	Associate Professor	Biology
Popkin, Samuel L., Ph.D.	Associate Professor	Political Science
Reynolds, Edward, Ph.D.	Associate Professor	History
Romo, Ricardo, Ph.D.	Assistant Professor	History
Rumbaut, Ruben G., Ph.D.	Assistant Professor	Sociology
Sanchez, Martha E., Ph.D.	Assistant Professor	Literature
Sanchez, Rosaura, Ph.D.	Associate Professor	Literature
Schiller, Herbert I., Ph.D.	Professor	Communications Program
Schultz, Sheldon, Ph.D.	Professor	Physics
Sebald, Anthony, Ph.D.	Assistant Professor	AMES
Simon, Melvin I., Ph.D.	Professor	Biology
Sites, Richard L., Ph.D.	Assistant Professor	EECS
Solis, Faustina, M.S.W.	Associate Professor	Community Medicine
Somero, Meredith G., Ph.D.	Associate Professor	Biology
Stern, Herbert, Ph.D.	Professor	Biology
Thiess, Frank B., Ph.D.	Lecturer with Security of Employment	Mathematics
Thomas, Charles W., II, Ph.D.	Professor	Urban and Rural Studies Program
Tolbert, Emory J., Ph.D.	Assistant Professor	History
Waisman, Carlos H., Ph.D.	Assistant Professor	Sociology
Watson, Joseph W., Ph.D.	Associate Professor, Provost of Third College	Chemistry
Williams, Sherley, M.A.	Associate Professor	Literature
Wulbert, Daniel E., Ph.D.	Professor	Mathematics
Yugerabide, Juan, Ph.D.	Associate Professor	Biology
* * *		
Cunningham, J. Barry, M.A.	Associate Supervisor	Physical Education
Douglass, John H., Ph.D.	Supervisor	Physical Education
Ezell, S. Dean, Jr., Ph.D.	Lecturer	Biology
Fenner-Lopez, Claudio, M.A.	Lecturer	Visual Arts
Fimbres, Gloria	Supervisor of Teacher Education	Teacher Education Program
Lawrence-Wallace, Cynthia, B.S.	Supervisor of Teacher Education	Teacher Education Program

Levin, James A., Ph.D.

Lecturer

Communications

Marshall, Margaret C., M.F.A.

Assistant Supervisor

Physical Education

Moll, Luis C., Ph.D.

Lecturer

Communications

Moss, Robert C., Jr., B.A.

Associate Supervisor

Physical Education

Souviney, Randall J., M.A.

Supervisor of Teacher Education

Teacher Education

Stavrianos, Leften S., Ph.D.

Adjunct Professor

History

Traupmann, Kenneth L., Ph.D.

Lecturer

Psychiatry

Honorary Fellow of the College

Ernesto Galarza, *Novelist and Educator*



Earl Warren College



The college's students and faculty represent all disciplines offered at UC San Diego. Graduation requirements consist predominantly of one major and two minor areas of study which enable a student to develop a program of study covering a wide range of material while focusing on a few particular areas. The diversity of our academic program has made Warren College an exciting home for lively and stimulating intellectual discourse.

In an effort to enhance the academic and intellectual development of its students, the college is committed to preparation for the post-baccalaureate years. Whether students wish to continue their education in graduate or professional school, seek out an immediate career, or pursue other options, the college stands ready to assist. Realizing the importance of future planning, the college has developed an active life/career planning program. Students are encouraged to identify their abilities and interests, examine career possibilities, and prepare for the future. The college's Academic Internship Program has been developed on the conviction that quality education results from a combination of classroom theory and practical experience. All Warren College students have the option of undertaking an off-campus assignment working full- or part-time for a public or private organization. Placements match each student's major area of academic study with a sponsoring organization. A Warren College student may enroll in the program for a maximum of sixteen units. It is the intention of the Academic Internship Program that students have the opportunity to observe and participate in a variety of organizational activities. The Internship Program is national in scope and varied in offerings. Students might work for a senator in Washington, a conservation group in San Francisco, a legal aid office

in Los Angeles, a business in San Diego, or any number of other possibilities. Efforts will always be made to develop new placements, based on a student's unique interests.

Warren College and the School of Medicine received an award from the Commonwealth Fund to develop a joint program designed to provide special undergraduate preparation for qualified students aiming for careers in the health sciences and the health professions. Students may indicate an interest at the time of entry into Warren College; however, formal application and admission into the program occur during the freshman year. See the "Warren College" section in the "Courses, Curricula, Programs of Instructions" section of this publication for more information.

The Graduation Requirements

To receive a Bachelor of Arts degree from Warren College a student must:

1. Satisfy the University of California requirements in American History and Institutions and in Subject A (see "Undergraduate Admissions, Policies and Procedures.")
2. Fulfill the general-education requirements described below.
3. Attain a C average (2.0) or better in all work attempted at the University of California.
4. Satisfy the college residency requirement that nine of the last eleven courses passed must be taken as a student in the college.
5. Pass forty-five four-unit academic courses or their equivalent (180 units).

To receive a Bachelor of Science degree from Warren College a student must comply with requirements 1 through 4 above. Additionally, the total number of courses must be forty-eight (192 units) of which fifteen must be upper-division courses in the major. Presently the Bachelor of Science

degree is offered only in the following engineering programs: chemical engineering, engineering physics, engineering science, computer engineering, electrical engineering, applied mechanics, systems science, and bioengineering.

Earl Warren College, the newest undergraduate college at the University of California, San Diego, enrolled its first students in the fall of 1974. Growing to a maximum of two thousand students in only three years, it is designed to provide the best of both worlds: the resources of a university with a strong tradition of academic excellence and the sense of belonging to a smaller community.

The college is named after Earl Warren, former chief justice of the United States Supreme Court and the only three-time governor of California. Mr. Warren, a native Californian, put himself through college and law school at the University of California (B.L. 1912; J.D. 1914). He also served as an ex-officio UC Regent for eleven years during his gubernatorial terms. Warren served as district attorney of Alameda County, and later was attorney general of California. He was governor during an era of lightning growth for California. He developed the State Department of Mental Hygiene and led a reform of the prison system in California by establishing the Board of Corrections and the Prisoner Rehabilitation Act. As governor, he provided government services each week to what amounted to a "new city of 10,000," including schooling for five hundred new young Californians every week. Under Chief Justice Warren, the Supreme Court elaborated a doctrine of fairness in such areas as criminal justice, voting rights, legislative districting, employment, housing, transportation, and education.

Earl Warren College should be of particular interest to students who wish to study a field or subject in depth. The general-education

program of the college is designed to provide each student with a maximum of flexibility. Under all circumstances it provides the student with necessary skills and the breadth of learning characteristic of a university education.

Students who transfer to Warren College from other institutions must complete the graduation requirements of the college. In order to determine which courses may be applied to the graduation requirements, the Office of the Provost will make an evaluation of prior work for each student at the time of his or her first enrollment.

The General-Education Requirements

The faculty of the college, in planning the college program, sought to impose a minimum number of explicit course requirements on students of the college. This plan stemmed from a firm conviction that each student should have the opportunity to develop a program best suited to his or her own interests, and carries with it a commitment from the faculty and staff of the college to provide extensive advising concerning 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, is normally taken in the freshman year. The courses aim primarily at helping the student discover his or her authentic voice in writing, and then at building on that base an increasingly conscious control of language. The sequence is intended to move from free writing through narrative to writing of a structural and critical complexity comparable to that of the college essay. The student's own ideas, experiences, and social

environment, along with a reading list in 10B, are the subject matter for writing in the course. The classes are small; they are taught in workshop style, devoting most of their time to the discussion of student papers. Ideally, each class should work at becoming an audience of increasingly competent critics whose ideas and suggestions enable its members to become skilled writers. Students who must complete the Subject A requirement will do so with this sequence.

2. Warren students must also complete a two-course sequence which requires formal or algorithmic reasoning. Subjects which can be taken to satisfy the formal skills requirement are: two courses in calculus, computer science, or symbolic logic.
3. Each student must complete a major. Warren College students may attempt any major offered at UC San Diego. Each department determines the courses required for its major; generally this will be 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 his or her program to 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. In addition to a major, each Warren College student must complete two programs of concentration ("minors.") Each program of concentration is designed to acquaint the student with two subjects other than the major. Thus, programs of concentration using courses from the major department, are rarely, if ever, possible.

Each department offers one or more programs of concentration. Each program of concentration is a focused collection of six courses. A typical program of concentration will consist of lower-division course work which serves as an introduction to the discipline (e.g., Economics 1A-B-C) followed by upper-division advanced work in the specified area of study (e.g., macroeconomics).

At least one of the programs of concentration a student completes must be noncontiguous; that is, in a discipline area outside that of the major. The discipline areas are 1) humanities and fine arts, 2) natural sciences, and 3) social sciences. A mathematics major could have one program of concentration in a related area, e.g. computer science, and one in some other discipline area, e.g. economics or literature.

For students who double major in two subjects that are noncontiguous (e.g., biology and literature), no additional programs of concentration will be required. For students who pursue two majors that are contiguous (e.g. psychology and economics), one noncontiguous minor will be required.

A detailed list of the college's programs of concentration is available in the Office of the Provost.

Honors

Warren College will award college honors with the

baccalaureate degree to students with a superior overall grade-point average at graduation. Superior grade-point average will be based upon the grade-point averages of the top 14 percent of the previous graduating class. The honors designations are *summa cum laude* (top 2 percent), *magna cum laude* (next 4 percent), and *cum laude* (next 8 percent). To be eligible for college honors, a student must have completed at least twenty courses (eighty quarter-units) for a

letter grade in the University of California. Honors earned will be recorded on each student's diploma.

Several of the major departments have established honors programs of intensive study for highly motivated students. The criteria for such honors are described in the departmental section of the catalog.

Phi Beta Kappa Society

The Phi Beta Kappa Society is a

national honorary society, originally founded at the College of William and Mary in 1776, in which membership is conferred for high scholastic standing. Membership is determined by vote of the chapter according to students' scholarship records. Warren students are advised that among the minimum requirements for election to this society are the demonstration of knowledge of a foreign language and a college-level quantitative science, such as mathematics.

The Faculty of Warren College

NAME	TITLE	DEPARTMENT
Anagnostopoulos, Georgios H., Ph.D.	Associate Professor	Philosophy
Baker, Bruce S., Ph.D.	Associate Professor	Biology
Beck, Nathaniel L., Ph.D.	Assistant Professor	Political Science
Berg, Darwin K., Ph.D.	Associate Professor	Biology
Bunch, James R., Ph.D.	Associate Professor	Mathematics
Burkhard, Walter A., Ph.D.	Associate Professor	EECS
Carpenter, Adelaide T., Ph.D.	Associate Professor	Biology
Chang, William S.C., Ph.D.	Professor	EECS
Comisso, Ellen T., Ph.D.	Assistant Professor	Political Science
Cornelius, Wayne, Ph.D.	Professor	Political Science
Corrigan, Mary K., M.A.	Associate Professor	Drama
Cowhey, Peter F., Ph.D.	Assistant Professor	Political Science
Crawford, Vincent P., Ph.D.	Assistant Professor	Economics
D'Andrade, Roy G., Ph.D.	Professor	Anthropology
Davis, Fred, Ph.D.	Professor	Sociology
Deak, Frantisek J., Ph.D.	Associate Professor	Drama
DeLuca, Marlene A., Ph.D.	Professor	Chemistry
Farrell, Peter, M.M.	Professor	Music
Fredman, Michael L., Ph.D.	Associate Professor	EECS
Gourevitch, Peter A., Ph.D.	Associate Professor	Political Science
Granger, Clive W.J., Ph.D.	Professor	Economics
Hammer, Jeffrey S., Ph.D.	Assistant Professor	Economics
Holland, John J., Ph.D.	Professor	Biology
Hughes, Judith M., Ph.D.	Associate Professor	History
Israel, Robert, M.F.A.	Assistant Professor	Drama
Kahr, Madlyn M., Ph.D.	Professor	Visual Arts

Kaprow, Allan, M.A.	Professor	Visual Arts
Kernell, Samuel H., Ph.D.	Associate Professor	Political Science
Kyte, Jack E., Ph.D.	Associate Professor	Chemistry
Lakoff, Sanford A., Ph.D.	Professor	Political Science
Langdon, Margaret H., Ph.D.	Professor	Linguistics
Lawder, Standish, Ph.D.	Associate Professor	Visual Arts
Lein, Allen, Ph.D.	Professor and Director, Health Professions Program	Reproductive Medicine
Lugannani, Robert, Ph.D.	Professor	EECS
Luker, Kristin, Ph.D.	Assistant Professor	Sociology
Magde, Douglas, Ph.D.	Assistant Professor	Chemistry
Martinez, Ronald L., Ph.D.	Assistant Professor	Literature
Middleman, Stanley, Ph.D.	Professor	AMES
Miles, John W., Ph.D.	Professor	AMES/IGPP
Milstein, Laurence B., Ph.D.	Associate Professor	EECS
Munk, Walter, Ph.D.	Professor	SIO
Nee, Thomas B., M.A.	Professor	Music
Neilson, Brooke, Ph.D.	Assistant Professor	Literature
Nesbitt, Muriel, Ph.D.	Associate Professor	Biology
Nodelman, Sheldon A., Ph.D.	Associate Professor	Visual Arts
Norberg, Kathryn, Ph.D.	Assistant Professor	History
O'Neil, Thomas M., Ph.D.	Professor	Physics
Perlmutter, David M., Ph.D.	Professor	Linguistics
Pomeroy, Earl, Ph.D.	Professor	History
Rappaport, Armin, Ph.D.	Professor	History
Riddell, Richard V., Ph.D.	Assistant Professor	Drama
Ringrose, David R., Ph.D.	Associate Professor	History
Rudee, M. Lea, Ph.D.	Professor, Provost of Warren College	EECS
Schneider, Alan M., Sc.D.	Professor	AMES
Scull, Andrew, Ph.D.	Associate Professor	Sociology
Selverston, Allen I., Ph.D.	Associate Professor	Biology
Sham, Lu Jeu, Ph.D.	Professor	Physics
Shirk, Susan L., Ph.D.	Assistant Professor	Political Science
Smallwood, Dennis E., Ph.D.	Associate Professor	Economics
Taylor, Julie M., Ph.D.	Assistant Professor	Anthropology
Trangenstein, John A., Ph.D.	Assistant Professor	Mathematics
Wadsworth, Adrian R., Ph.D.	Associate Professor	Mathematics
Wills, Christopher J., Ph.D.	Professor	Biology
Winters, Barbara, Ph.D.	Assistant Professor	Philosophy
Wiseman, Jacqueline, Ph.D.	Professor	Sociology
York, Herbert F., Ph.D.	Professor	Physics

Dann, Diana E., M.S.	Assistant Supervisor	Physical Education
Dau, Paolo M., Ph.D.	Acting Assistant Professor	Philosophy
Kobayashi, Bert N., Ph.D.	Supervisor	Physical Education
Sweet, Judith, M.S.	Associate Supervisor	Physical Education

Graduation Requirements in the Colleges of UC San Diego

COMPARISON OF THE GRADUATION REQUIREMENTS AMONG THE FOUR COLLEGES OF UC SAN DIEGO

Unless otherwise indicated, the figures in this chart refer to the number of COURSES rather than to the number of units. Most UC San Diego courses carry four quarter-units of credit, and a student usually takes four courses each quarter. Subjects are broadly classed 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 these categories which is different from that of the major.

	REVELLE COLLEGE	MUIR COLLEGE	THIRD COLLEGE	WARREN COLLEGE
GENERAL EDUCATION	HUMANITIES (with labs in writing and rhetoric) 3 PHYSICS 2 CHEMISTRY 2 BIOLOGY 1 FOREIGN LANGUAGE: usual number of courses to attain proficiency 3 CALCULUS 3 SOCIAL SCIENCE 3 FINE ARTS 1 Additional SOCIAL SCIENCE, FINE ARTS, or HUMANITIES 3	WRITING 1 - 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 each of TWO of the following categories: SOCIAL SCIENCE MATHEMATICAL SCIENCE NATURAL SCIENCE	WRITING 2 BIOLOGY 1 CHEMISTRY 1 PHYSICS 1 OPERATIVE LOGIC 2 One course in each of TWO of the following: COMPUTER SCIENCE MATHEMATICS STATISTICS SOCIETAL ANALYSIS 3 One course in one of the following: LITERATURE AND SOCIETY THIRD WORLD STUDIES One course in each of two of the following: COMMUNICATIONS ECONOMICS URBAN AND RURAL STUDIES A THREE COURSE SEQUENCE 3 in social science, humanities, or fine art.	WRITING 2 FORMAL SKILLS 2 Two courses in calculus OR two in computer science OR two in symbolic logic OR one in computer science and one in symbolic logic PROGRAMS OF CONCENTRATION 12 Two programs, each typically consisting of three lower-division and three upper-division courses One program must be noncontiguous to the major
MINOR	ONE REQUIRED. May be a focused noncontiguous minor OR any six noncontiguous courses.....6	OPTIONAL	OPTIONAL	See PROGRAMS OF CONCENTRATION in General Education section above
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	46 courses (184 1/4 units)	Forty-five courses (180 units)*. At least eighteen courses must be upper-division.	Forty-five courses (180 units)*; eighteen or more of these courses must be upper-division, and three must be outside the area of the major.	Forty-five courses (180 units)*

*More courses and more units will be required for certain of the engineering majors

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 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.

An Advanced-Standing 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. An advanced-standing applicant may not disregard his or her college record and apply for admission as a freshman.

Advanced-Standing Credit

Credit which an undergraduate student earns 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 advanced-standing credit is determined by the Office of Admissions.

A Nonresident Applicant

A student who lives outside the state of California and who is required to present a higher scholarship average than is required of California residents to be eligible for admission to the university.

An International Applicant

A student who claims citizenship in another country and has a nonimmigrant visa.

UNDERGRADUATE COLLEGES AND MAJORS

Even though you may be uncertain about your major, your application for admission *must* include the name of the UC San Diego college with which you plan to affiliate.

In the preceding chapter, which describes the educational philosophies of the four colleges at UC San Diego, you will find information concerning the requirements of each college. It is

very important that you read the preceding chapter carefully, and that you decide which of the colleges is the right one for you.

The listing below shows the names of undergraduate major programs listed alphabetically in this catalog in capitals; the lower-case subheads are the available concentrations within these programs or the general terms to help you locate a major in your desired field of study.

ANTHROPOLOGY

APPLIED MECHANICS AND ENGINEERING SCIENCE (AMES)

Applied Mechanics

Bioengineering

Bioengineering with
engineering emphasis

Bioengineering with
premedical emphasis

Chemical Engineering

Engineering Sciences

Systems Science

Art — see VISUAL ARTS

Biochemistry — see BIOLOGY,
CHEMISTRY

Bioengineering — see AMES

BIOLOGY

Biochemistry

Biology

Cell Biology

Genetics

Human Biology

Microbiology

Physiology

Population Biology

Biophysics — see PHYSICS

CHEMISTRY

Biochemistry
 Chemical Physics
 Chemistry
 Earth Sciences/Chemistry

CHICANO STUDIES

Chicano Studies — History
 Chicano Studies — Literature
 Chicano Studies — Political
 Science
 Chicano Studies — Sociology

CHINESE STUDIES**CLASSICAL STUDIES****COMMUNICATIONS**

Communications Visual Arts

Computers — see EECS

DRAMA

Earth Sciences — see also
CHEMISTRY, PHYSICS

ECONOMICS

Economics
 Management Science

Education — see Footnote 1

**ELECTRICAL ENGINEERING AND
COMPUTER SCIENCES (EECS)**

Applied Physics
 Acoustics
 Electronics
 Optics
 Solid State
 Computer Engineering
 Computer Science
 Electrical Engineering
 Communication Systems
 Electronics
 Systems and Control
 Engineering Physics
 Information Science
 Communication Systems
 Electronics
 Systems and Control

Engineering — see AMES, EECS

English — see LITERATURE

French — see LITERATURE

Geology — see CHEMISTRY,
PHYSICS

German — see LITERATURE

HISTORY

Economic and Social History
 European History
 Non-Western History (Africa
 and Asia)

Western Hemisphere History
 (United States and Latin
 America)

Information Science — see EECS

Languages — see LITERATURE

LINGUISTICS**LITERATURE**

English-American
 French
 General Literature
 German
 Literature/Writing
 Spanish

Management Science — see
ECONOMICS

MATHEMATICS

Applied Mathematics

MUSIC

Music/Humanities

PHILOSOPHY**PHYSICS**

Biophysics
 Biophysics with premedical
 emphasis
 Earth Sciences/Physics
 Physics

POLITICAL SCIENCE

Pre-Law — see Footnote 2

Pre-Medical — see Footnote 3

PSYCHOLOGY

Experimental
 General

Russian — see LITERATURE

SOCIOLOGY

Spanish — see LITERATURE

Systems Science — see AMES

Teacher Education Program —
 See Footnote 1

THIRD WORLD STUDIES**URBAN AND RURAL STUDIES****VISUAL ARTS**

Art History/Criticism
 Studio

FOOTNOTE 1 To become a teacher in California, you must major NOT in education but in an academic subject or group of subjects, while at the same time taking special courses related to educational topics. UC San Diego offers a program leading to a preliminary Multiple Subjects credential within the framework of academic departments. There is no separate department of education. The main themes of the program are multicultural and child centered education. To obtain a lifetime credential in California, the teacher must complete a fifth year of college within five years of receiving the B.A. degree and teach successfully full time, for two years. See "Teacher Education Program" for more information.

**UNDERGRADUATE
ADMISSIONS**

The university's 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; (3) Standardized aptitude tests provide a broad base for comparison, and mitigate the effects of differing grading practices.

NOTE: The admission requirements discussed here are for students applying for fall, 1980 and thereafter.



FOOTNOTE 2 Law schools do not require any particular major. They require evidence of good performance in demanding subjects. Economics, history, literature, sociology, philosophy, psychology, engineering, etc., are all appropriate majors to pursue for this purpose.

FOOTNOTE 3 As with law schools, schools of medicine do not require a particular major, but they do want solid backgrounds in chemistry, mathematics, physics, and biology. Especially recommended as premedical programs are AMES (bioengineering), biology, chemistry, physics.

ADMISSION AS A FRESHMAN APPLICANT

The university defines a freshman applicant as 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.

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.

If you are not a resident of California you must also meet certain additional requirements that are discussed in the following pages.

High School Diploma Requirement

You must have a diploma from a high school in order to enter the university as a freshman. The Certificate of Proficiency, awarded by the State Department of Education upon successful completion of the High School Proficiency Examination, will be accepted in lieu of the regular high school diploma. Subject, scholarship, and examination requirements discussed below must also be met.

Subject Requirement

You must complete certain high school subjects with at least a grade of C in each semester of each course. (Counselors often refer to these subjects as the "a through f" list. See list below.) If you are a graduate of a California high school, these courses must appear on the certified course list placed on file with the university by your high school principal. With one exception, any of the "a through f" courses may be used to satisfy admission requirements even if

taken prior to tenth grade as long as your high school gives you credit for them. The exception is the "d" requirement; courses in laboratory science must be taken after completion of ninth grade.

Courses taken in high school summer programs are considered as belonging to the following school year. For example, a summer school course taken after completion of the ninth grade is considered a tenth-grade course.

If you are a graduate of an out-of-state high school, the Office of Admissions will determine which of your courses are equivalent to those in the following list:

Subject Requirements ("a through f")

- a. History 1 year
One year of United States history, or one-half year of United States history and one-half year of civics or American government, whichever combination has the higher grade.
- b. English 3 years (4 years, beginning with applicants for fall, 1981.)
Three years of English composition and/or literature, university preparatory in nature. Not more than one course will be accepted from the ninth grade. Check with your counselor for a complete list.
- c. Mathematics 2 years
Two years of mathematics — elementary algebra, geometry, intermediate and advanced algebra, trigonometry, calculus, elementary functions, matrix algebra, probability, statistics, or courses combining these subjects. Nonacademic courses such as arithmetic and business mathematics may not be used.
- d. Laboratory Science 1 year
A year course in one laboratory science, taken in the tenth, eleventh, or twelfth grade. A combination of any two semesters of biology, botany,

physiology, or zoology is acceptable.

- e. Foreign Language 2 years
Two years of one foreign language. Any foreign language with a written literature may be used.
- f. Advanced Course 1 or 2 years
This requirement must be satisfied by one of the following:
Mathematics
One year of advanced college-preparatory mathematics in addition to the two years used to meet requirement "c" above.
Foreign Language
Either an additional year in the same language used for the "e" requirement or two years of a second foreign language.
Science
A year course in any laboratory science completed in addition to the laboratory science used for "d" above.
Elective Courses
Although the ten to eleven units listed above are the only courses used in computing the grade-point average, a total of fifteen high school units is required for admission to the university. (A year course in high school is equivalent to one unit.)

Scholarship Requirement

You must earn at least a C in each of the required courses. In addition, your grade-point average (GPA) must be high enough to make you eligible when the GPA is considered along with the score on your chosen aptitude test. (See "Examination Requirement" below, with the "Table of Grade-Point Averages and Corresponding Required Test Scores.")

The GPA is based only upon those of the required "a through f" courses taken in grades ten, eleven, and twelve. Approved "a through f" courses taken before the tenth grade apply to the subject requirement, but are not used in



computing the GPA for the scholarship requirement. If you have gone beyond the minimum requirements in one or more of these subjects, the best grades will be used. For example, if you have more than the required two years in mathematics (which is an excellent idea!), the two best years will be used in the calculation. The same is true in the other required subjects.

Your grades will be considered

by the university exactly as shown on your official transcript, with no extra weight given to courses bearing such labels as "advanced," "accelerated," or "honors." Any weighing of this sort must be done by the high school.

Grades are counted on a semester basis, unless your high school records only year grades. You may repeat up to two

semesters of courses in which you received a grade of D or lower to meet the subject and scholarship requirements. When you have repeated a course, the original D or F is not included in figuring the GPA, but the final grade will not be counted higher than C. If the D or F was earned before the ninth grade, the repeated course will be treated as if you were taking it for the first time.



Examination Requirement

All freshman applicants must submit scores from the following test pattern. This requirement also applies to advanced-standing applicants with fewer than twelve quarter- or semester-units of transferable college credit.

1. One aptitude test:
 - A. The Scholastic Aptitude Test (SAT) total score;
 - OR
 - B. The American College Test (ACT), composite score.
2. Three achievement tests (College Entrance Examination

Board), which must include: (A) English composition (literature not acceptable); (B) one from among the social studies or the foreign languages; (C) mathematics (level 1 or 2).

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.

California residents: if you make a perfect score on the SAT (1600) or the ACT (35) you need a GPA of only 2.78 to be eligible for admission. On the other hand, if you have a GPA of 3.30 or better, you

are eligible even with the lowest test scores. Between these extremes, the following table is used. If you know your GPA (using the best grades earned in grades ten, eleven, and twelve to meet minimum requirements in the "a through f" pattern), the table will show the required test score; conversely, if you know your SAT total or your ACT composite, the table will show the required GPA.

Out-of-state applicants: Out-of-state students must have a GPA of 3.40 or better.

Freshman applicants should arrange to take these tests and

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	35	1600	3.04	23	990
2.79	35	1580	3.05	22	970
2.80	34	1550	3.06	21	950
2.81	34	1530	3.07	21	920
2.82	33	1510	3.08	20	900
2.83	33	1480	3.09	19	880
2.84	33	1460	3.10	18	850
2.85	32	1440	3.11	18	830
2.86	32	1410	3.12	17	810
2.87	32	1390	3.13	16	780
2.88	31	1370	3.14	15	760
2.89	31	1340	3.15	14	740
2.90	30	1320	3.16	14	710
2.91	30	1300	3.17	13	690
2.92	29	1270	3.18	12	670
2.93	29	1250	3.19	11	640
2.94	28	1230	3.20	10	620
2.95	28	1200	3.21	9	600
2.96	27	1180	3.22	9	570
2.97	27	1160	3.23	8	550
2.98	26	1130	3.24	8	530
2.99	26	1110	3.25	7	500
3.00	25	1090	3.26	7	480
3.01	25	1060	3.27	6	460
3.02	24	1040	3.28	6	430
3.03	24	1020	3.29	5	410
			3.30	5	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.

have their scores reported to the Office of Admissions as early as possible. 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.

SAT TEST DATES

11 Oct. 1980	SAT only (Calif., Fla., Ga., N. Car., N.Y. and Texas only)
1 Nov. 1980	SAT and Achievement
6 Dec. 1980	SAT and Achievement
24 Jan. 1981	SAT and Achievement
4 Apr. 1981	SAT only
2 May 1981	SAT and Achievement
6 June 1981	SAT and Achievement

ACT TEST DATES

18 Oct. 1980
13 Dec. 1980
14 Feb. 1981
28 Mar. 1981
13 June 1981

Admission 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 take the SAT and the three Achievement Tests, but you must earn higher scores. The minimum total score on the Scholastic Aptitude Test is 1,100, and you must earn at least 500 on each Achievement Test. If you are a California applicant, your total score on the three achievement tests must be 1,650 or higher. If you are a nonresident applicant, your total score on the three achievement tests must be 1,730 or higher.

(See "Examination Requirement" for test dates and addresses.)

ADDITIONAL PREPARATION FOR UNIVERSITY WORK

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 two 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.

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

ADVANCED-STANDING COLLEGE CREDIT

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 college 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.

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

Advanced Placement

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 ten quarter-units of university credit for most examinations in which you earn a score of 5, 4, or 3. These credits will apply toward the total required for graduation from the university.

ADMISSION AS AN ADVANCED-STANDING APPLICANT

The university defines an advanced-standing 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. An advanced-standing applicant may not disregard his or her college record and apply for admission as a freshman.

Scholarship Requirement

The requirements for admission in advanced standing vary according to your high school record. If you are a nonresident applicant, you must also meet the additional requirements described at the end of this section. If you have completed fewer than twelve quarter- or semester-units of transferable college credits since high school graduation, you must also satisfy the examination requirement for freshman applicants.

The transcript you submit from the last college you attended must show, as a minimum, that you were in good standing and that you had earned a grade-point average of 2.0 or better. If your grade-point

Undergraduate Admissions

average fell below 2.0 at any one college you attended, you may have to meet additional requirements in order to qualify for admission.

California residents: As an advanced-standing applicant you must meet one of the following conditions:

1. If you were eligible for admission to the university as a freshman, you may be admitted in advanced standing any time after you have established an overall grade-point average of 2.0 or better in another college or university.
2. If you were not eligible for admission as a freshman only because you had not studied one or more of the required high school subjects, you may be admitted after you have:
 - a. Completed, with a grade of C or better, appropriate college courses in the high school subjects that you lacked, and
 - b. Established an overall grade-point average of 2.0 or better in another college or university, and
 - c. Completed twelve or more quarter- or semester-units of transferable college credit since high school graduation or have completed the pattern of tests required of freshman applicants.
3. If you were not eligible for admission as a freshman because of low scholarship or a combination of low scholarship and a lack of required subjects, or if you choose not to make up all of your subject deficiencies, you may be admitted when you have:
 - a. Established an overall grade-point average of 2.4 or better in another college or university, and
 - b. Completed eighty-four quarter-units (fifty-six semester-units) of college credit in courses accepted

by the university for transfer, and

- c. Completed, with a grade of C or better, appropriate college courses in high school subjects that you lacked. Up to two units (a unit is equal to a year's course) of credit may be waived

OR

Completed one college course in mathematics, one in English, and one in either U.S. history or government, a laboratory science, or a foreign language. You must pass these courses with a grade of C or better. Courses other than mathematics must be transferable to the university. The course in mathematics must complete a sequence of courses at least as advanced as the equivalent of two years of high school algebra (elementary and intermediate), or one year of algebra (elementary), and one year of high school geometry.

Out-of-state applicants: If you met the admission requirements for freshman admission as a nonresident, you must have a GPA of 2.8 or higher in college courses that are accepted by the university for transfer credit.

If you are a nonresident applicant who graduated from high school with less than a 3.4 GPA in the subjects required for freshman admission, you must have completed at least eighty-four quarter-units (fifty-six semester-units) of transferable work with a GPA of 2.8 or higher. Upon successful completion of that work, two units of the required high school subjects may be waived. If you lacked any of the required subjects in high school, you must complete college courses in those subjects with a grade of C or higher.

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.

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 still be granted.

The transferability of units from California community colleges and all other postsecondary institutions proceeds as follows: (1) transferability of units is decided by the systemwide 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 UC San Diego college by its provost; (3) applicability of units toward the major is decided by the appropriate UC San Diego department. Before applying to UC San Diego you may obtain more information on many of these matters from the Office of Relations with Schools.

Applications from students who have earned a four-year degree or who appear to have more than 135 quarter-units (90 semester-units) of transfer credit will be reviewed by the provost of the UC San Diego college to which they have applied.

INTERNATIONAL APPLICANTS

Applicants who present evidence of above average scholarship achievement will be considered for admission.

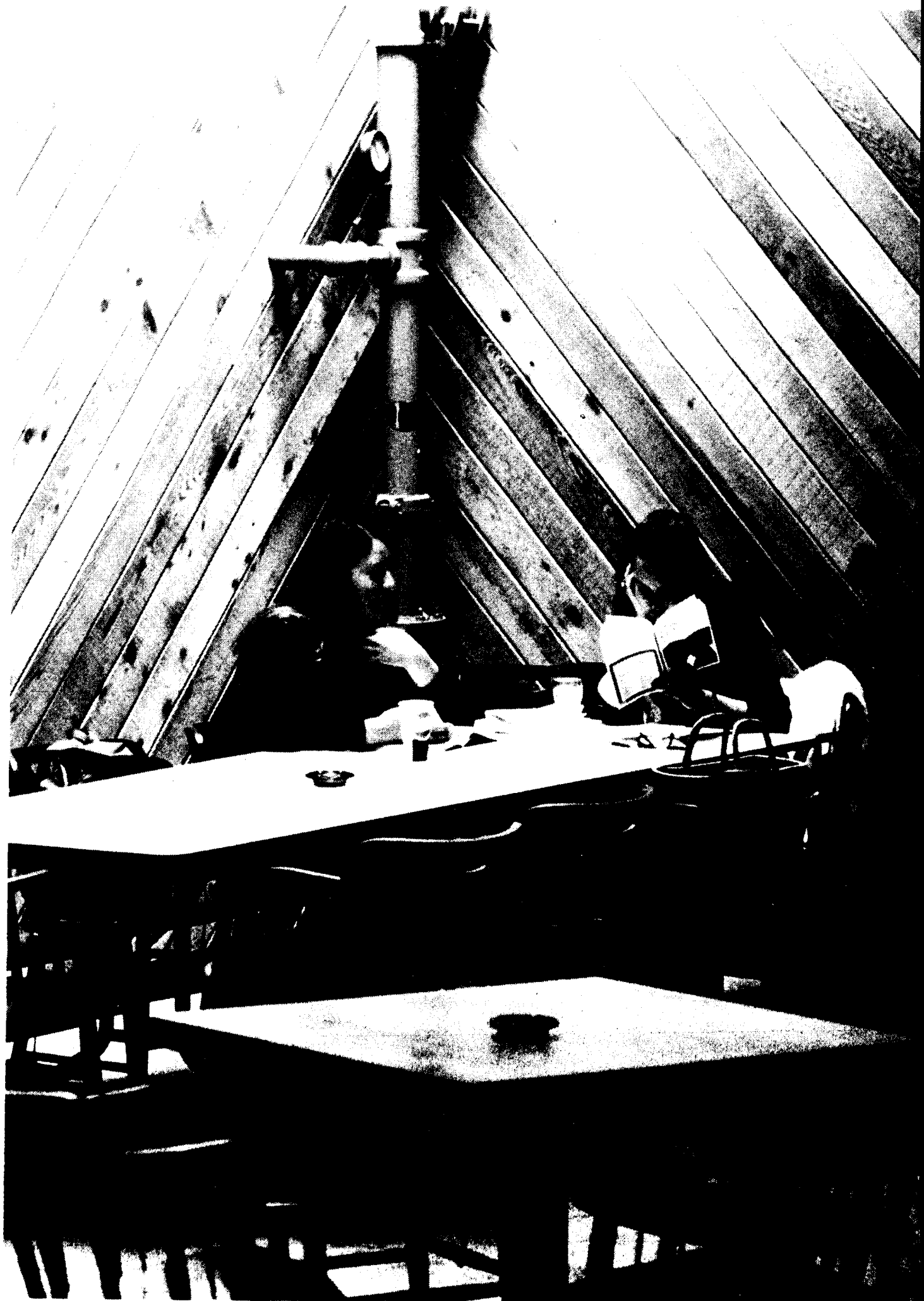
Courses at UC San Diego are conducted in English, and every student must have sufficient command of that language to benefit from instruction. To demonstrate such command, students whose native language is not English, and who have not previously studied in the United States or another English-speaking country, will be expected to take the Test of English as a Foreign Language (TOEFL) before coming to the U.S. Arrangements for taking this test may be made by writing to the Educational Testing Service, P.O. Box 899, Princeton, New Jersey 08540.

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. Foreign students whose command of English is slightly deficient will be required to take an English course, and therefore a reduced program. For this reason, foreign applicants are strongly advised to perfect their English before coming to the United States.

In addition to an adequate English language background, foreign students must have sufficient funds to cover all fees, living and other expenses, and transportation connected with their stay in the United States. They should bear in mind that expenses are likely to be heaviest at the

beginning (see "Fees and Expenses").

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



ADMISSION PROCEDURES

Applying for Admission

Application packets for undergraduate admission are available from high school and community college counselors or from any UC campus admissions office. A special application is available for international students with nonimmigrant status. Submit your completed application and the related materials to the admissions office on the campus where you wish to enroll on or after the appropriate date below:

Application Filing Dates

Fall Quarter 1981	Nov. 1, 1980
Winter Quarter 1982	July 1, 1981
Spring Quarter 1982	Oct. 1, 1981

All campuses observe the dates listed above for the beginning of application filing. Each campus will accept for consideration all applications filed during the first month of the filing period. After the first month the deadline will vary from campus to campus.

The application to San Diego *must* include a choice of college (Muir, Revelle, Third, Warren) before it can be completely processed. Each college at UC San Diego has enrollment quotas that limit the number of new freshman and new advanced-standing students that may be accepted. Once these quotas have been filled, applicants will be requested to select another college at UC San Diego that is still open.

Change of UC Campus Choice

If your plans change after you have filed for admission, and you prefer to enroll at a different campus of the University of California, you must write to Student Academic Services, 570 University Hall, University of California, Berkeley, Berkeley, California 94720, indicating the campus at which you now wish to be considered, and the reason for your

change. Your records will be transferred to the campus you indicate, provided facilities are available there.

Application Fee

There is a nonrefundable fee of \$20 (\$25 effective fall quarter, 1981) for filing an application for admission. Make your check or money order payable to The Regents of the University of California and attach it to your application form.

Duplicate Applications

You should not file more than one application for admission to the university for the same quarter. Since the admission requirements are the same on all campuses, admission to the university entitles you to attend the campus you have selected if there is space available. If you apply for admission to more than one campus, the processing of your applications will be significantly delayed. Fees submitted with duplicate applications will not be refunded.

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 where the application is filed.

If you are applying for admission as a freshman, ask your high school to submit a preliminary transcript showing your work through the junior year. The transcript also should list the courses you are now taking and those you plan to take. You must also arrange for a final transcript that includes your courses and grades for the senior year and the date of graduation. If you have passed the California High School Proficiency Examination, a verification of your Certificate of Proficiency is required. 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 in advanced standing, the Office of Admissions will need transcripts from your high school of graduation, from each college you have attended, and a preliminary transcript from your present college, listing the courses you are now taking.

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.

Notification of Admission

When the application is received in the Office of Admissions, and initial processing has been completed, you will be notified of the receipt of your application. With the normal volume of applications this processing usually takes from four to six weeks.

The length of time before final notification of admission varies depending on the unique circumstances of each applicant. In general, most applicants for the fall quarter will receive final notification by late spring. Applicants for the winter and spring quarters will be notified as soon as possible following receipt of all appropriate transcripts. In the case of advanced-standing applicants, final determination of eligibility cannot be made with more than one term to be completed. Delays will occur if required records have not been received by the Office of Admissions.

If admitted to the university, you will be asked to sign and return a Statement of Legal Residence and a Statement of Intention to Register (S.I.R.), accompanied by a nonrefundable fee of \$50. This amount will be applied toward payment of the university registration fee for the quarter for which you have been admitted.

Reapplication

An application for admission is effective only for the quarter for which it is submitted. If you are not eligible for admission, or if you are admitted and do not register, you must file a new application if you wish to be admitted to another quarter. The new application will be considered in light of the admission requirements currently in effect and the space available on the campus.

Deferred Admission

If you are admitted, and find attendance is precluded for reasons other than enrollment at another institution, you may request that your admission be deferred to the subsequent quarter by writing to the Office of Admissions. Your request will be promptly reviewed.

Student Health Requirement

Entering students are requested to complete a Medical History Form, submit the results of a tuberculin test prior to registration, and send them 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 inter-collegiate athletic competition. Routine physical examinations are not provided by the Student Health Service.

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 initial registration for classes. All materials needed for registration will be provided at the college provosts' offices on the days assigned for new students' registration.

The Undergraduate Program

The normal undergraduate program consists of an average of four courses each quarter for four years. Students wishing to take more than sixteen units of credit in a quarter should refer to the quarterly *Schedule of Classes* for information regarding possible signatures of approval which may be required for their programs.

Confirmation of Program

All students enrolled for classes will receive Study-List Cards. The Study-List Card confirms the student's official program as it appears on the registrar's file. Students will be held responsible for all the courses listed unless an appropriate Withdrawal Form or Change of Program Card (Drop/Add Card) has been filed with the Office of the Registrar.

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 \$3,500 - \$4,000 for California residents living away from home.

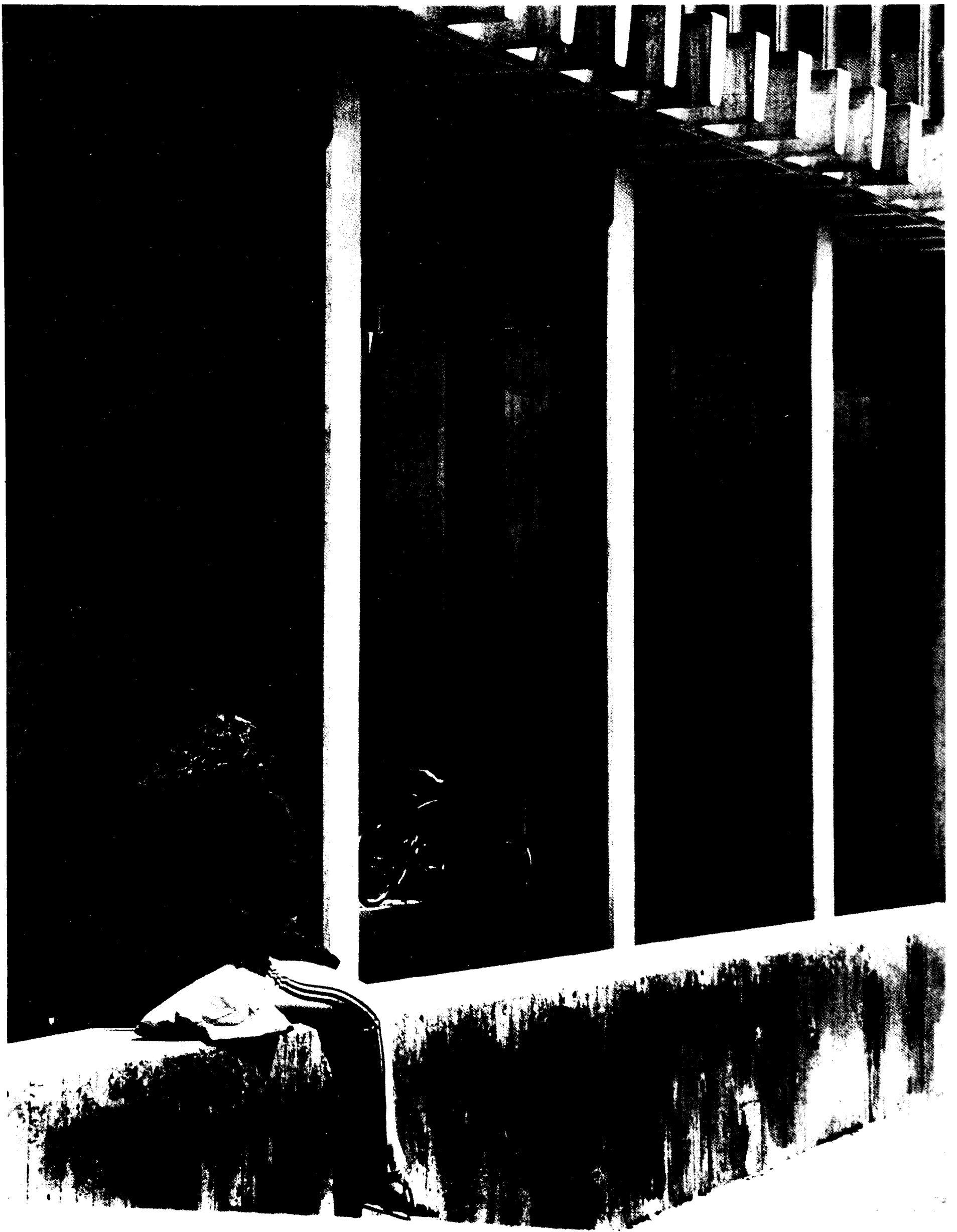
It is possible to live simply and to participate moderately in the life of the student community on a limited budget. The best that the university can do to assist the student in planning a budget is to indicate certain and probable expenses. For information regarding student employment, loans, scholarships,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

Estimated Expenses for Undergraduate Residents of California

	FALL QUARTER	WINTER QUARTER	SPRING QUARTER	TOTAL
University Registration Fee	\$131	\$131	\$131	\$393
Educational Fee	100	100	100	300
Campus Activity Fee	6	6	6	18
Student Center Fee	10	10	10	30
Board and Room in Residence Halls (Avg.)	756	757	757	2270
Books, Supplies (Approx.)	100	90	80	270
Personal Expenses (Approx.)	200	200	200	600
Total	\$1303	\$1294	\$1284	\$3881

NOTE: Fees are subject to change by the board of regents.

*Subject to increase winter quarter.



Undergraduate Registration and Academic Regulations

REGISTRATION

Prior to the quarter for which they have been admitted, new students will receive information from their college regarding orientation and initial registration for classes. All materials needed for registration will be provided at the college provosts' offices on the days assigned for new students' registration.

Continuing students (those currently registered or eligible to register) should refer to the quarterly *Schedule of Classes* and the quarterly registration procedures letter for specific registration and fee-payment instructions. The *Schedule of Classes* is published prior to each quarter and may be purchased at the University Bookstore. The quarterly registration procedures letter accompanies the packet of registration materials distributed to all continuing students eligible to register.

A student who has not registered (enrolled for classes AND paid fees) by the deadline date published in the quarterly *Schedule of Classes* will be removed from the registrar's file and must initiate reinstatement procedures. The *Schedule of Classes* is available in the University Bookstore approximately midway through the preceding quarter.

DEFINITIONS

A Registered Student

A student who has enrolled for classes and paid registration fees.

An Enrolled Student

A student whose Preferred-Program Card has been received and processed by the Office of the Registrar and who has been assigned space in classes, but who has not paid registration fees.

Class Level

Regular students are classified as freshmen, sophomores (upon completion of 40.5 quarter-units), juniors (upon completion of 84 units), seniors (upon completion of 135 units).

The Undergraduate Program

The normal undergraduate program consists of an average of four courses each quarter for four years. Students wishing to take more than sixteen units of credit in a quarter should refer to the quarterly *Schedule of Classes* for information regarding possible signatures of approval which may be required for their programs.

Confirmation of Program

All students enrolled for classes

will receive Study-List Cards. The Study-List Card confirms the student's official program as it appears on the registrar's file. Students will be held responsible for all the courses listed unless an appropriate Withdrawl Form or Change of Program Card (Drop/Add Card) has been filed with the Office of the Registrar.

Change of Program

After an official Preferred-Program Card has been filed with the Office of the Registrar, an undergraduate may add or drop courses or sections of courses by submitting a Drop/Add Card. Students should refer to the quarterly *Schedule of Classes* calendar as well as study-list forms for drop/add procedures, deadline dates, and any signature and fee requirements which apply to each respective period.

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, Building 101, Administrative Complex. Students will be held responsible for communications from any university office sent to the last address given,

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and should not claim indulgence on the plea of not receiving the communication.

Concurrent Enrollment

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

Approval for Enrollment Beyond 192 Units

The minimum unit requirement for the bachelor's degree is 184 quarter-units in Revelle College and 180 quarter-units in Muir, Third, and Warren Colleges. A student is expected to complete the requirements for graduation within this minimum unit requirement.

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.

Bar from Registration

A student may be barred from registering for classes for the following reasons:

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

Each student who becomes subject to a bar-from-registration-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 petition from the provost or dean who requested the barring action. Reinstatement is not final until this petition has been processed by the registrar.

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' 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.

Final Grades

The Office of the Registrar will distribute copies of final grades to students as soon as possible at the end of the fall and winter quarters. Spring quarter grades will be mailed to 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.

UC SAN DIEGO POLICY ON INTEGRITY OF SCHOLARSHIP

The following has been approved by the Academic Senate and the chancellor as campus policy.

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. Instructors, for their part, will exercise care in planning and supervising academic work, so that honest effort will be encouraged.

Academic Dishonesty

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

No student shall knowingly, without proper authorization, procure, provide, or accept any materials which contain questions or answers to any examination or assignment to be given at a subsequent date.

No student shall, without proper authorization, complete, in part or in total, any examination or assignment for another person.

No student shall, without proper authorization, knowingly allow any examination or assignment to be completed, in part or in total, for him or her by another person.

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

No student shall employ unauthorized aids in undertaking course work in or out of the classroom.

No student shall alter class assignments and then (re)submit them for regrading without proper authorization.

Faculty Responsibilities

Faculty are responsible for stating clearly to students in their classes the instructional objectives of the

course at the beginning of each term. One of the stated requirements of the course should be the successful completion of course material by the student, in compliance with the standards described above. Faculty members are also responsible for stating clearly to students the University Policy on Integrity of Scholarship and which forms of aid and collaboration on assignments are authorized for that course.

When an instance of academic dishonesty is discovered by a faculty member, it is his or her responsibility to act promptly. If, after consultation with the department chairperson (or the chairperson's designated representative), the faculty member is convinced a serious breach of academic honesty has occurred, the faculty member may assign a failing grade in the course because the student has not satisfactorily completed the course requirements. In less serious circumstances, the faculty member may employ more lenient measures. The faculty member shall not assign a failing grade until he or she has met with the student (or has given written notification to the student requesting a meeting). Pending such a meeting the faculty member shall not assign a grade and the NR procedure shall be invoked.

No matter what measures are taken, university regulations require that faculty members report all cases of dishonest academic practices to the dean of the student's college (or to the dean of Graduate Studies).

Administrative Action

In addition to these academic measures, administrative action shall be taken by the dean of the student's college (or the dean of Graduate Studies). The minimum administrative penalty is probation and the establishment of a disciplinary record. However, students who have committed serious or repeated breaches of

academic honesty face the likelihood of dismissal or expulsion from the university.

A student who is guilty of academic dishonesty may not drop the course to avoid a failing grade without the approval of the instructor, regardless of the rules governing "drops."

Appeals

In order to prevent abuses of these policies the right of a student to appeal the decisions of a faculty member and administrator must be insured. In the future a student should be able to appeal both the grade and the administrative action to a campus judicial board composed of faculty, student, and administration representatives. The board would determine if there is sufficient evidence of academic dishonesty to justify administrative discipline; the grading action would be evaluated by the faculty representatives on the board in conjunction with the faculty member involved. Until such a judicial board is created, students may utilize current appeals procedures.

FEES AND RESIDENCY

General

The university registration fee, the educational fee, and the nonresident tuition fee (if applicable) must be paid for the student to be considered as registered. A student who has not registered (enrolled for classes and paid fees) by the deadline date published in the quarterly *Schedule of Classes* will be removed from the registrar's file and must initiate reinstatement procedures. The *Schedule of Classes* is available in the University Bookstore approximately midway through the preceding quarter.

NOTE: See "Estimated Expenses for Undergraduate Residents of California", page 89.

Payment of Fees

All general university fees and deposits (university registration fee, educational fee, and tuition for nonresidents of California) must be paid at the time of registration, as announced by the chancellor. Other fees and deposits may be paid at this time if desired; in any event, all miscellaneous fees should be paid within one week of the date of registration or by the date announced by the chancellor. An additional charge will be made for failure to pay required fees or deposits by the dates announced (see "Miscellaneous Fees and Service Charges").

With the exception of appeals to the attorney in 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 120 calendar days of notification of the campus final decision. Such appeals should be addressed to the attorney in residence matters at the address given below in the section entitled "Nonresident Tuition."

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, money order, or registration card.

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 who died as a result of an accident or injury

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caused by external violence or physical force incurred in the performance of such duties.

Except for miscellaneous fees and service charges, campus student association or program fees, and nonresident tuition where applicable, no fees are charged to certain U.S. military dependents or survivors.

Students who believe themselves entitled to one of these exemptions must apply for a fee exemption 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 the graduate division at the campus they propose to attend. Undergraduate students normally should contact the dean of their college or school.

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 required to pay nonresident tuition. Each student admitted to the university is advised of his or her provisional classification at the time of admission. Final classifications are made by the deputy to the attorney in residence matters who is located in the registrar's office of the campus the student proposes to attend, or by the Attorney in Residence Matters, 590 University Hall, 2200 University Avenue, Berkeley, California 94720, 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 attorney in residence matters at the address given above or should telephone

(415) 642-3437 for further information.

University Registration Fee

The university registration fee is currently \$131 per quarter for undergraduates. This fee, which must be paid at the time of registration, covers certain expenses for use of library books, for recreational facilities and equipment, for registration and graduation, for all laboratory and course fees, and for such consultation, medical advice, and hospital care or dispensary treatment as can be furnished by the Student Health Service or by health and accident insurance purchased by the university. 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 Financial Aids Office for full ruling.

In addition, there is a campus activity fee of \$6 per quarter for undergraduates and a student center fee of \$10 per quarter for all students to be used for the construction and operation of the student centers.

Educational Fee

The educational fee was established for all students beginning with the fall quarter, 1970. The undergraduate educational fee is \$100 per quarter. Resident students with demonstrated financial need may defer payment of the educational fee by accepting an obligation to repay, at a later date, the sum deferred. Students interested in this provision should contact the Financial Aids Office.

Fee Reductions — Undergraduates Reduced Educational Fee

Undergraduate students enrolled in fewer than nine units at 4:30 p.m.

at the end of the third week of classes will be eligible for a refund of one-half of the educational fee: \$50. Students who fall below nine units after this date will receive no refund, and any student who receives a refund will be billed for \$50 if, after the refund date, the number of units increases to nine or more. Undergraduates enrolled in Education Abroad and other special programs are excluded from this reduced fee policy. 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.

Nonresident Tuition Fee

Students who have not been residents of California for more than one year immediately prior to the residence determination date for each term in which they propose to attend the university are charged, along with other fees, a nonresident tuition fee of \$800 for the quarter. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter.

Reduced Tuition — Nonresident Undergraduates

Nonresident undergraduates enrolled in fewer than twelve units as of 4:30 p.m. at the end of the third week of classes may be eligible for a reduction of the \$800 nonresident tuition. Tuition for nonresident undergraduates enrolled in fewer than twelve units will be assessed at \$67 per unit. Students who fall below twelve units after this date will not be eligible for a refund, and any student who receives a refund will be billed \$67 per unit if, after the refund date, the

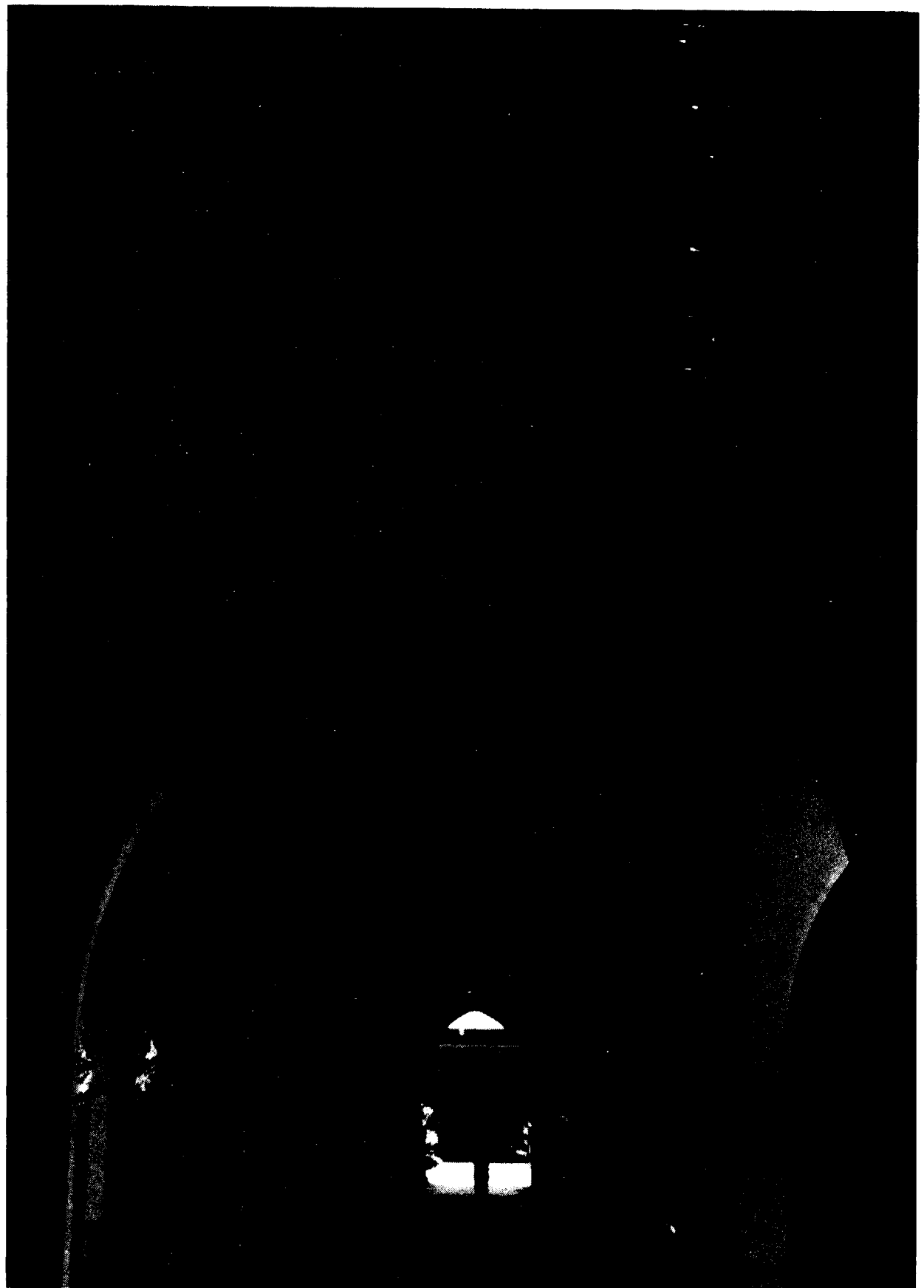
number of units exceeds twelve. Eligible nonresidents must apply for this refund at the Office of the Registrar, Building 102, Administrative Complex, before the end of the quarter they are eligible.

RESIDENCE REQUIREMENTS

General

In order to be classified as a resident for tuition purposes, an adult student must have established residence in California for more than one year immediately preceding the residence determination date for the term during which he or she proposes to attend the university, and relinquished any prior residence. An adult student must couple his or her physical presence within this state for one year with objective evidence that such presence is consistent with the intent in making California the permanent home. If these steps are delayed, the one-year durational period will be extended until BOTH presence and intent have been demonstrated for one full year. Physical presence within the state solely for educational purposes does *not* constitute the establishment of California residence under state law, regardless of the length of his or her stay in California.

Relevant indicia which can be relied upon to demonstrate one's intent to make California a permanent residence include, but are not limited to, the following: registering and voting in California elections; designating California as the permanent address on all school and employment records, including military records if one is in the military service; obtaining a California driver's license or California Identification Card, if a nondriver; obtaining California vehicle registration; paying California income taxes as a resident, including income earned outside this state; establishing an abode where one's permanent belongings are kept within California; licensing for professional



practice in California; and the absence of these indicia in other states during any period for which residence in California is asserted. Documentary evidence may be required. No single factor is controlling or decisive. All relevant indicia will be considered in the classification determination.

The student must petition to have his or her status changed at the office of the registrar at the campus attended, and documentation of residence (driver's license, voter registration receipt, etc.) may be requested at that time.

The residence of the parent with whom an unmarried minor (under age eighteen) maintains his or her place of abode is the residence of the unmarried minor. When minors live with neither parent their residence is that of the parent with whom they maintained their last place of abode. Minors may establish their residence when both parents are deceased and a legal guardian has not been appointed. The residence of unmarried minors who have a parent living cannot be changed by their own act, by the appointment of a legal guardian, or

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by relinquishment of a parent's right of control.

A man or a woman establishes his or her residence. A woman's residence shall not be derivative from that of her husband, or vice versa.

Exceptions

1. Students who remain in this state after a parent, who was theretofore domiciled in California for at least one year prior to leaving and has, during the student's minority and within one year immediately prior to the residence determination date, established residence elsewhere, shall be entitled to resident classification until they have attained the age of majority and have resided in the state the minimum time necessary to become a resident so long as, once enrolled, they maintain continuous attendance at an institution.
2. Nonresident students who are minors or eighteen years of age and can evidence that they have been totally self-supporting through employment and actually present within California for the entire year immediately prior to the residence determination date and have evidenced the intent to make California their permanent home may be eligible for resident status.
3. Students shall be entitled to resident classification if immediately prior to the residence determination date they have lived with and been under the continuous direct care and control of any adult or adults other than a parent for not less than two years, provided that the adult or adults having such control have been California residents during the year immediately prior to the residence determination date. This exception continues until the student has attained the age of eighteen and has resided in the state the minimum time necessary to become a resident student, so long as continuous attendance is maintained at an institution.
4. Exemption from payment of the nonresident tuition fee is available to the natural or adopted child, stepchild, or spouse who is a dependent of a member of the United States military stationed in California on active duty. Such resident classification may be maintained until the student has resided in California the minimum time necessary to become a resident. If a student is enrolled in an institution and the member of the military is transferred on military orders to a place outside the United States immediately after having been on active duty in California, the student is entitled to retain resident classification under conditions set forth above.
5. Students who are members of the United States military stationed in California on active duty, except a member of the military assigned for educational purposes to a state-supported institution of higher education, shall be entitled to resident classification until they have resided in the state the minimum time necessary to become a resident.
6. Students who are adult aliens are entitled to resident classification if they have been lawfully admitted to the United States for permanent residence in accordance with all applicable provisions of the laws of the United States and have thereafter established and maintained residence in California for more than one year immediately prior to the residence determination date.

A student who is an adult alien shall be entitled to resident classification if the student is a refugee who has been granted parolee, conditional entrant, or indefinite voluntary departure status in accordance with all applicable laws of the United States, provided that the student has lived in the state for one year immediately prior to the residence determination date. (Effective until June 30, 1980.)
7. Students who are minor aliens shall be entitled to resident classification if the student and the parent from whom residence is derived have been lawfully admitted to the United States for permanent residence, provided that the parent has had residence in California for more than one year after acquiring a permanent resident visa prior to the residence determination date for the term.

A student who is a minor alien shall be entitled to resident classification if the student is a refugee who has been granted parolee, conditional entrant, or indefinite voluntary departure status in accordance with all applicable laws of the United States, provided that the student has lived in this state for one year immediately prior to the residence determination date. (Effective until June 30, 1980.)
8. Children of deceased public law enforcement or fire suppression employees, who were California residents and who were killed in the course of law enforcement or fire suppression duties, may be entitled to resident classification.

Procedures

New and returning students are required to complete a Statement of Legal Residence. The student's status is determined by the attorney in residence matters' deputy who is located in the Office of Admissions and Registrar, Building 102, Administrative Complex.

Students are cautioned that this summation is not a complete explanation of the law regarding residence. They should also note that changes may have been made

in the rate of nonresident tuition and the residence requirements between the time this catalog statement is published and the relevant residence determination date. Regulations have been adopted by the regents, a copy of which is available for inspection in the Office of Admissions and Registrar.

All students classified incorrectly as residents are subject to reclassification and to payment of all nonresident fees not paid. If incorrect classification results from false or concealed facts by the student, the student also is subject to university discipline. Resident students who become nonresidents must immediately notify the attorney in residence matters' deputy.

Inquiries from prospective students regarding residence requirements for tuition purposes should be directed to the Attorney in Residence Matters, University of California, 590 University Hall, Berkeley, California 94720. No other university personnel are authorized to supply information relative to residence requirements for tuition purposes. Any student, following a final decision on residence classification by the residence deputy, may make written appeal to the attorney in residence matters at the above address within 120 days after notification of the final decision by the residence deputy.

Waivers of Nonresident Tuition

To the extent funds are available, nonresident tuition waivers may be granted to spouses and dependent, unmarried children under age twenty-one of university faculty members who are members of the Academic Senate; to the unmarried, dependent children under age twenty-one of a full-time university employee whose permanent assignment is outside California and who has been employed by the university for more than one year immediately prior to the opening of the term; and for certain foreign

students. Inquiries regarding these waivers normally should be directed to the dean of the graduate division of the campus the student proposes to attend.

In addition, certain student teaching assistants and teaching fellows, and certain graduate students designated as university fellows and distinguished scholars may be eligible for nonresident tuition waivers as a form of financial aid. Such students should contact the Financial Aid Office at their campus for further information.

Miscellaneous Expenses, Fees, Fines and Penalties

Books and stationery average about \$80 per quarter. However, students should also be aware of the following possible expenses:

Statement of intent to register fee (new undergraduate)	\$50
Application fee	25
Changes in study list after announced dates (Drop/Add cards)	3
Duplicate registration and/or other cards from enrollment packet	3
Duplicate Student ID Card	3
Request to Receive/Remove Grade "I" (undergraduate)	5
Removal of Grade "I" (graduate)	5
Transcript of record	2
Late filing of announcement of candidacy for B.A.	3
Late filing of enrollment cards	10
Returned check collection	5
Late payment of fees (late registration)	25
(See also "Withdrawal from the University," in this chapter.)	

Parking Fee

Students who park motor vehicles on the campus are subject to parking fees. Parking permits are sold by the university cashier. A copy of the campus parking

regulations may be obtained from the cashier at the time of permit purchase.

GENERAL DEGREE REQUIREMENTS

Each of the undergraduate colleges on the San Diego campus has specific requirements for a degree. (See "Choosing a College at UC San Diego.") 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: History 1A-B-C, 7A-B-C, 150 through 169, and Political Science 10, 109, 110, 112A or B.
3. By presenting proof of having received a score of 500 or more on the CEEB Achievement Test in American History.
4. By passing an examination to be conducted by the Committee on Educational Policy and Courses. The student will have no more than two opportunities to pass the examination. A student who fails in the second attempt will be obliged to satisfy the requirement by passing one of the designated courses.

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5. 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.
6. By presenting proof of having satisfied the present requirement as administered at another collegiate institution within the state.
7. 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.
8. An alien attending the university on a 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

Every undergraduate student (including international students) must demonstrate an acceptable level of ability in English composition upon entrance to the university **or during the first year**. Satisfaction of the university Subject A requirement may be met by:

1. Achieving a score of 600 or better in the CEEB Achievement Test in English Composition, or
2. achieving a grade of 5, 4, or 3 in the College Entrance Examination Board (CEEB) Advanced Placement Examination in English, or
3. satisfaction of California State University & Colleges English Examination, or
4. entering the university with credentials showing the completion of an acceptable college-level course of four quarter-units or three semester-

units in English composition with a grade of C or better. (International students can complete an acceptable English as a Second Language course.)

Satisfaction of the Subject A requirement is determined by the Office of Admissions. Students not meeting the requirement in one of the ways described above may:

1. Demonstrate acceptable writing ability on a test administered on the campus to: Muir College students — by the Muir College Writing Program. International students, all colleges — by the Language Program.
2. After enrollment, successful completion of a course or courses specifically designed to satisfy both the Subject A requirement and the college writing requirement. All courses must be completed with a satisfactory grade of C or Pass or better,

At UC San Diego these courses are:

Revelle College Students

Humanities 10A-B-C
Humanities 11A-B-C
or
Humanities 12A-B-C

All three courses must be taken (not necessarily in A-B-C sequence).

Muir College Students

Muir 10
or
Muir 10 and Muir 11

Muir students must also take Muir 20 to satisfy the writing requirement for graduation.

Warren College Students

Warren 10A (Prerequisite to 10B)
and
Warren 10B

Third College Students

TCCP 10B and TCCP 10C
English as a Foreign Language courses will also be available for international students through the Department of Linguistics and,

upon satisfactory completion of a proficiency examination, will satisfy the Subject A requirement only.

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 or participates in the UC Education Abroad Program, exceptions may be granted by the provost.

REGULATIONS PERTAINING TO UNDERGRADUATE STUDENTS

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. The following conditions must exist:

1. Lower-division prerequisites may overlap.
2. At least eight upper-division courses 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.

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 and the provost of the student's college. The applicant shall show that his or her background is adequate for the proposed study.
2. A student must have completed at least eighty-four units of undergraduate study and must be in good academic standing (2.0 grade-point average or better).
3. Normally, credit for supervised special studies in a single term may total no more than four units. If the total number of units of such courses exceeds four in a given term, the following further documentation is required. For five to eight units, there must be a recommendation from the chairperson (or one of the chairpersons) of the department(s) concerned. For nine or more units, there must be a recommendation from a committee including three or more faculty appointed by the chairperson (or one of the chairpersons) of the department(s) concerned. All recommendations must be submitted to and approved by the provost of the student's college and must attest to the educational merit of the proposed study and the suitability of the number of units.
4. Only a grade of P or NP is to be assigned for a 197, 198, or 199 course.
5. Subject to the approval of the CEP Subcommittee on Undergraduate Courses, a department may impose additional limitations on its supervised special studies courses.

Undergraduate Assistance in Courses

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

Guidelines

1. An undergraduate instructional apprentice shall be an upper-division student. He or she shall be involved only with lower-division courses.
2. Students are not permitted to assist in courses in which they are enrolled.
3. Each department should set the grade-point average which it considers a minimal guarantee of preparation and ability both in specific departmental course work and overall.
4. The faculty instructor is responsible for maintaining the overall quality of instruction, and has responsibility for all grades given in the class. The undergraduate instructional

apprentice shall not be placed in full charge of individual sections.

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.

Honors at Graduation

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

1. There shall be a campuswide 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

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award honors at graduation only to those who are eligible to receive college honors.

2. Each department or program may award honors to a student at graduation if the following two criteria are met:
 - a. 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*.
 - b. 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.

GRADING POLICY

Grades in undergraduate courses are defined as follows: A, excellent; B, good; C, fair; D, barely passing; F, not passing (failure); I, incomplete (work of passing quality but incomplete for good cause). The designations P (Pass) and NP (Not Pass) are used in reporting grades on some undergraduate courses. P denotes a letter grade of C or better (See "Special Grade Options"). NR indicates no record or no report of grade was received from the instructor.

Grade Points

Grade points are assigned on a four-point basis: A, 4 points per unit; B, 3 points per unit; C, 2 points per unit; D, 1 point per unit; F and I, zero points. The grade-point average is computed by dividing the total number of grade points earned by the total unit value of courses attempted. P, NP, NR, and I grades are excluded in computing the grade-point average.

No Report/No Record

An NR appearing on student transcripts in lieu of a grade indicates that the student's name appeared on a course report but no grade was assigned by the instructor. An NR entry will lapse automatically into an F 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.

SPECIAL GRADE OPTIONS

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 counted in satisfaction of degree requirements may be taken 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.

After the Preferred-Program Card has been filed, the Drop/Add Card will be 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.

Muir College

Policy regulations state that:

1. A Muir College student may have no more than one-fourth of the total course units counted in satisfaction of degree requirements in courses taken on a P/NP basis.
2. Muir College's general education courses may be taken on a P/NP basis if the courses are not prerequisites to majors.
3. Courses to be counted toward a departmental major or as prerequisites to the major may not be taken on a P/NP basis except with the consent of the department chairperson or his or her designated representative.
4. All courses taken as nonmajor electives may be taken on a P/NP basis.
5. Courses taken to be counted toward a Muir Special Project major may be taken for a letter grade only. For a course to be counted as part of a Muir Special Project major the student must earn in it a grade of C or better.
6. Course approval forms for 199's and Muir Special Project 199's must be completed and submitted to the department by preenrollment week of each quarter. Students must have accumulated a minimum of eighty-four units to be able to enroll in 199's.
7. Courses taken to satisfy a minor which is optional at Muir must normally be taken on a letter-grade basis with the exceptions of one lower-division course and one upper-division course (*only if it is a 199*) which may be taken P/NP.

Revelle College

Policy regulations state that:

1. Courses taken Pass/Not Pass may not be used in satisfaction of any lower-division Revelle College breadth requirements except fine arts.
2. Upper-division courses to be counted toward a departmental major may not be taken on a Pass/Not Pass basis. Individual departments and/or advisers may authorize exceptions to this regulation.
3. All courses used to satisfy the noncontiguous minor (or courses) requirements may be taken on a Pass/Not Pass basis.
4. All courses taken as electives may be taken on a Pass/Not Pass basis.

Third College

Policy regulations state that:

1. Courses to be counted toward a departmental major or as prerequisites to the major must be taken on a letter-grade basis, not Pass/Not Pass (P/NP).
2. Courses to be counted toward a minor must be taken on a letter-grade basis, not P/NP.
3. Courses taken toward completion of the Third College general-education requirements may be taken on a Pass/Not Pass basis while at the same time, the restrictions for prerequisites to majors and courses counted toward minor must be observed.
4. All 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.

Warren College

Policy regulations state that:

1. Warren College students in good standing may take up to one-fourth of their total units in satisfaction of degree requirements on a P/NP basis.

2. Courses to be counted toward a departmental major, or as a prerequisite to the major, must be taken for a letter grade. Individual departments may authorize exceptions to this regulation.
3. Warren College's required writing courses, 10A and 10B, must be taken P/NP. Courses counted for the formal skills requirement may be taken on a P/NP basis, unless these courses are also prerequisites to a major.
4. Courses to be counted toward the required two programs of concentration may be taken on a P/NP basis.
5. All courses taken as nonmajor electives may be taken on a P/NP basis.

Repeat of D, F, or NP Grades

Undergraduates may repeat courses only when grades of D, F, or NP were received. When a D, F, or NP course is repeated and is one among the first sixteen units repeated, it will not be counted in the grade-point average. In the case of repetitions beyond sixteen units, the grade-point average will be based on all grades assigned and total units attempted. Courses in which a grade of D or F has been awarded may not be repeated on a P/NP basis. Undergraduates may repeat a course in which a grade of NP has been awarded, for a P/NP or letter-grade if applicable. Repetition of a course more than once requires approval of the appropriate provost.

Incomplete Grades

The 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.

The grade Incomplete may be

assigned in undergraduate courses when a student's work is of passing quality, but incomplete for good cause.

Undergraduate students whose work is of passing quality, but incomplete for a good cause, shall file a Request to Receive/Remove Grade Incomplete form. A \$5 fee is payable at the Cashier's Office. Students should file all copies of this request with the instructor prior to the scheduled final examination.

An I grade may be replaced upon completion of the required work by the last day of finals week in the following quarter. If not replaced by this date, the I grade will lapse into an F or NP grade, depending upon the student's initial grading option.

Grade Appeals

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

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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 nonacademic criteria were used, it shall interview any individual whose testimony might facilitate resolution of the case. The complainant shall make available to the Committee all of his or her work in the course which has been graded and is in his or her possession. The instructor shall make available to the Committee all records of student performance in the course and graded student work in the course which is still in his or her possession. The complainant and the instructor shall be interviewed. At the conclusion of the case each document shall be returned to the source from which it was obtained.
 2. The Committee shall complete its deliberations and arrive at a decision within two weeks of its determination that evidence of the use of nonacademic criteria had been submitted. A record of the Committee's actions in the case shall be kept in the Senate Office for three years.
 3. If the allegations of the complainant are not upheld by a preponderance of the evidence, the Committee shall so notify the complainant and the instructor in writing. Within one week of such notification, the complainant and the instructor shall have the opportunity to respond to the findings and the decision of the Committee. If there are no responses, or if after considering such responses the Committee sustains its decision, it shall so notify the complainant and the instructor in writing and the grade shall not be changed.
 4. If the Committee determines that nonacademic criteria were significant factors in establishing the grade, it shall give the student the option of either receiving a

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

- a. The Committee shall serve written notification of its findings and its decision to the complainant and the instructor. The complainant and the instructor may respond in writing to the findings and the decision of the Committee within one week of such notification.
- b. If there are no responses, or if after considering such responses the Committee sustains its decision, the grade shall be changed; the Committee shall then instruct the registrar to change the grade to P or S or, if the student elected the drop option, to retroactively drop the course from the student's record. Copies of the Committee's instruction shall be sent to the complainant and the instructor.

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

1. No punitive actions may be

taken against the instructor solely on the basis of these procedures. Neither the filing of charges nor the final disposition of the case shall, under any circumstances, become a part of the personnel file of the instructor. The use of nonacademic criteria in assigning a grade is a violation of the Faculty Code of Conduct. Sanctions against an instructor for violation of the Faculty Code may be sought by filing a complaint in accordance with San Diego Division By-Law §230(D). A complaint may be filed by the student or by others.

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

Credit by Examination

With the instructor's approval and concurrence by the student's provost, undergraduate students in good standing may petition to obtain credit for some courses by examination. 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 or F. There will be a \$5 fee for each Credit by Examination Petition

submitted. For further information, consult the Office of the Provost in your college.

Scholastic Requirements

The scholastic status of all UC San Diego undergraduates is governed by the following provisions:

1. **PROBATION** Students are subject to probation if at the end of a quarter their grade-point average or cumulative grade-point average is less than 2.0(C).
2. **DISQUALIFICATION** Students are subject to disqualification for enrollment if their grade-point average for the quarter is below 1.5, or if they have completed two consecutive terms on academic probation.

Continued registration of undergraduates who are subject to academic disqualification is at the discretion of the faculty of their college. On the San Diego campus the faculties normally delegate this responsibility to the provost.

If the provosts feel students will be able to overcome their academic deficiency, they will allow the students to continue on probation.

Students who have been dismissed, or who are on probation and wish to transfer from one campus of the university to another, must obtain the approval of the dean or provost into whose jurisdiction they seek to transfer. After completing a transfer, the student is subject to the supervision of the dean or provost on the new campus. See "Intercampus Transfer" below. (Students subject to disqualification are not eligible to receive veterans' benefits and should contact the Veteran's Affairs Office on campus.)

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

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Financial Services or refer to the Veterans Information Bulletin available at the Office of the Registrar.

Application for Degree

Undergraduate seniors are required to file an Undergraduate Degree Application Card when enrolling for their last quarter. The deadline for filing without penalty is the end of the second week of the quarter of graduation. Failure to file this petition may delay receipt of diploma.

Withdrawal from the University

Students who decide to withdraw from the university after payment of registration fees, must file a Request for Withdrawal Form with the Office of the Registrar before leaving the campus. This form serves two purposes: (1) a refund of fees if appropriate (see below); (2) withdrawal from classes without penalty of F grades. 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. The effective date for calculating a fee refund is the day the student's withdrawal form is received in the Office of the Registrar.

New Undergraduate Students

Prior to the first day of instruction, the registration fee is refunded minus the \$50 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. A student claiming an earlier date of withdrawal and therefore a higher percentage refund must submit written evidence to support his or her claim.

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, Building 102, Administrative Complex. A nonrefundable fee of \$25 is charged for each application for readmission filed.

Whereas a formal leave of absence request for undergraduates is not required,

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.

Transcript of Records

Application for a transcript of record 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; transcripts will be released only upon signed request of the student. A \$2 fee is charged for one transcript, \$1 is charged for each additional copy requested at the same time. Checks should be made payable to The Regents of the University of California.

Intercampus Transfer

An undergraduate 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. The student who wishes to transfer must file an application on the present campus. Application forms for intercampus transfer are available in the Office of the Registrar.





Graduate Studies

At the University of California, San Diego, all programs leading to masters' 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 work and to distinguish between graduate studies and those programs leading to baccalaureate or strictly professional degrees. The Ph.D. degree should be regarded as a degree identified with research and creative scholarship.

Graduate studies involve 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. There can be no guarantee that satisfactory research will be completed in any prescribed time. 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 Biological Studies and the Scripps Clinic and Research Foundation have enhanced the area's reputation. From the beginning, UC San Diego has been determined to offer intellectual opportunities not elsewhere available. Much of the training it offers takes place outside the classroom — it is not only in the seminar but in independent research and in tutorial work that graduate study goes on. In addition to the permanent faculty, there are many visitors from other universities; there are opportunities to study at other branches of the University of California; and there is constant association between members of the university and those intellectuals who have come here to work within the institutes on campus. It is the aim of this university to achieve a standard of excellence for graduate study; the freedom it offers, tempered by the discipline it demands, has already endowed UC San Diego with a unique spirit and an enviable list of accomplishments.

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 not normally appropriate to an undergraduate major. These courses normally 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. In addition, courses at the upper-division level (100-197) may be taken in partial satisfaction of the requirements for an advanced degree. The main purpose of graduate study is to foster independence and originality of thought in the pursuit of knowledge.

The graduate student is accorded considerable liberty in choice of courses as long as the minimum academic and residence requirements are met.

Graduate Degrees Offered 1980-81

Anthropology	Ph.D.*	Marine Biology	Ph.D.*
Biology	Ph.D.	Mathematics	M.A., Ph.D.
Chemistry	Ph.D.*	Mathematics (Applied)	M.A.
Comparative Studies in Language, Society and Culture	Ph.D.†	Music	M.A., Ph.D.
Computer Science	M.S., Ph.D.	Neurosciences	Ph.D.*
Earth Sciences	Ph.D.*	Oceanography	Ph.D.*
Economics	Ph.D.*	Philosophy	Ph.D.*
Engineering Sciences: (Aerospace Engineering)	M.S., Ph.D.	Physics	M.S., Ph.D.
(Applied Mechanics)	M.S., Ph.D.	Physics (Biophysics)	Ph.D.
(Bioengineering)	M.S., Ph.D.	Physiology and Pharmacology	Ph.D.*
(Electrical Engineering)	M.S., Ph.D.	Political Science	M.A., Ph.D.‡
(Engineering Physics)	M.S., Ph.D.	Psychology	Ph.D.*
(Systems Science)	M.S., Ph.D.	Sociology	Ph.D.*
History	M.A., Ph.D.#	Theatre	M.F.A.
Linguistics	Ph.D.*	Visual Arts	M.F.A.
Literature			
Comparative	Ph.D.*		
English and American	M.A., Ph.D.*		
French	M.A., Ph.D.		
German	M.A., Ph.D.		
Spanish	M.A., Ph.D.		

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

#Students are admitted for the M.A. only in Third World History, European History, American History and Latin American History

†Students who have completed some graduate study at UC San Diego and have been admitted to a doctoral program may apply for this interdisciplinary program.

‡Pending administrative approval.

ADMINISTRATION

The Office of Graduate Studies and Research

The Office of Graduate Studies and Research is administered by a dean appointed by the chancellor. The dean is responsible to the vice chancellor, academic affairs and to the Graduate Council, a standing committee of the Academic Senate, for the administration of graduate affairs. The dean is a member of planning and administrative committees of the university.

The dean of graduate studies is responsible for graduate admissions, student degree programs, the administration of fellowships, traineeships, and other graduate-student support, and the maintenance of common standards of high quality in graduate programs across the campus.

The Graduate Council

The Graduate Council is a standing committee of the San Diego Division of the Academic Senate. The primary function of the Council is to exercise general responsibility for graduate-study programs and to implement systemwide policies, procedures, requirements and standards. Its members are selected by the Committee on Committees to give proper representation to the academic departments, schools, and interdepartmental programs on the San Diego campus.

The Graduate Adviser

The graduate adviser in a department or group is appointed by the dean and is the person to whom graduate students are to 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 or group, and supplying relevant information as requested by the dean.
7. Assisting the dean in the

application of university regulations governing graduate students, graduate study, and graduate courses.

8. Advising the chairperson of the department and the dean in the planning and construction of the graduate program in the department or group.

Graduate Student Council

The Graduate Student Council (GSC) is the officially recognized graduate student representative body at UC San Diego and works for all graduate students — including those at SIO and the Medical School — in all academic, administrative, campus and state-wide areas. The GSC, composed of two representatives from each department, and a chairperson, appoints graduate-student representatives to important campus organizations and committees, including the Academic Senate, the Graduate Council, the Program Review Committee and the systemwide Student Body Presidents' Council. The GSC also sponsors group, departmental, and campus-wide graduate student projects and social activities. Council meetings are always open, and any graduate student may apply to the Council for help in any graduate student matter.

Graduate Student Affirmative Action

The University of California, San Diego has made a commitment to increase the enrollment of graduate students from those groups, such as minorities, women, the aged, and physically handicapped, which have been historically under-represented in the university as a result of economic, educational or societal inequities. The graduate student affirmative action effort grew out of the need to facilitate the admission of and to provide support for these groups. Several forms of financial assistance are available to applicants who demonstrate the

academic potential to complete requirements for advanced degrees. The Office of Graduate Studies and Research, together with graduate departments and groups, administers fellowships, scholarships, traineeships, nonresident tuition scholarships, teaching or language assistantships, and research assistantships — all of which are available on a competitive basis.

Further information and assistance regarding graduate student affirmative action activities for women and minorities, the aged, and the physically handicapped may be obtained from the Office of Graduate Studies and Research, Building 103, Administrative Complex.

THE MASTER'S DEGREE

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, students should consult with their advisers before selecting a plan for completion of degree requirements.

PROGRAMS OF STUDY

Plan I: Thesis Plan

Following advancement to candidacy, the student electing Plan I must submit a thesis. The thesis committee, appointed by the chairperson of the department and approved by the dean of graduate studies, consists of at least three faculty members (two from the candidate's major department and one, preferably tenured, from a different department).

Thirty-six quarter units are required: eighteen units in graduate courses, including at least 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.

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. Acceptance of the thesis by the librarian represents the final step in the completion of all requirements by the student for a master of arts or master of science degree on the San Diego campus.

Plan II: Comprehensive Examination Plan

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.

Thirty-six quarter units are required: twenty-four units in graduate courses, including at least fourteen units in graduate-level courses in the major field; and twelve additional units in graduate or upper-division courses.

GENERAL 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 final quarter in which the degree is to be awarded. (See

"Registration in the Final Quarter," pages 125.)

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, including 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 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.)

Courses and Grades

Only upper-division and graduate courses in which a student is assigned grades A, B, C, or S are counted in satisfaction of the requirements for the Master of Arts or Master of Science degrees. Grades of IP and I, as well as NR, will automatically lapse to an F or U if they have not been removed when the final report for the degree is submitted to the Office of Graduate Studies and Research.

Graduate Work at Other Campuses of the University of California

With the approval of the department concerned and the dean of graduate studies, work completed with a grade of B or better at other campuses of the University of California may be accepted in satisfaction of one of the three quarters of residence and one-half of the total units required for the Master of Arts or Master of Science degree at UC San Diego.

Graduate Work Completed Elsewhere

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 UC San Diego.

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

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 at least three faculty members (two from the department and at least one, preferably tenured, from a different department).

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.

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. Acceptance of the thesis by the librarian represents the final step in the completion of all requirements by the student 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. 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 UC San Diego.

A candidate must be registered in the final quarter in which the degree is to be awarded. (See "Registration in the Final Quarter," page 125.)

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, including a minimum of five quarters or more 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.

Courses and Grades

Only upper-division and graduate courses in which a student is assigned grades A, B, C, or S are counted in satisfaction of the requirement for the Master of Fine Arts degree. Grades of IP and I, as

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well as NR, will automatically lapse to an F or U if they have not been removed when the final report for the degree is submitted to the Office of Graduate Studies and Research.

Graduate Work Completed Elsewhere

In exceptional circumstances, a student may be given a leave of absence for the purpose of study elsewhere. While appropriate credit may be allowed for course work completed elsewhere with a grade of B or better in a master's degree program, the period involved will not reduce the residence requirement of two years for visual arts and eight quarters for theatre at UC San Diego.

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 disciplines and having demonstrated the ability to make original contributions to knowledge in their fields of study. More generally, the degree constitutes an affidavit of critical aptitude in scholarship, imaginative

enterprise in research, proficiency and style 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 or group (course work, teaching, departmental examinations, etc.). When the

NORMATIVE TIMES FOR DOCTORAL PROGRAMS

Department or Group Program	Normative Time	Department or Group Program	Normative Time
Applied Mechanics and Engineering Sciences		Literature	
(Aerospace Engineering)	5 years	Comparative	6 years
(Applied Mechanics)	5 years	English and American	5 years
(Bioengineering)	5 years	French	5 years
(Bioengineering) Ph.D.-M.D. program	6½ years*	German	5 years
(Engineering Physics)	6 years	Spanish	5 years
(Systems Science)	5 years	Mathematics	5 years
Anthropology	6 Years	Music	5 years
Electrical Engineering	With master's from another university — 4 years; without a master's — 5 years	Neurosciences	5 years
Biology	5 years	Neurosciences Ph.D.-M.D. program	7 years*
Biology Ph.D.-M.D. program	7-8 years*	Philosophy	6 years
Chemistry	5½ years	Physics	
Chemistry Ph.D.-M.D. program	7 years*	Theoretical Physics	5 years
Economics	5 years	Experimental Physics	6 years
History	6 years	Physiology and Pharmacology Ph.D.-M.D. program	7 years*
Linguistics	5 years	Political Science	5 years*
		Psychology	5 years
		Psychology Ph.D.-M.D. program	7 years*
		Scripps Institution of Oceanography	
		Oceanography	6 years
		Earth Science	6 years
		Marine Biology	5 years
		Sociology	5 years

*Pending administrative approval

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 is advanced to candidacy.

The second or in-candidacy stage is devoted primarily to independent study and research and to the preparation of the dissertation. Three quarters of academic residency should elapse between advancement to candidacy and the final defense of the dissertation.

Foreign Language Requirements

Some departments require candidates to demonstrate language proficiency in one or more languages, or proficiency in computer technology, as part of the formal requirements for the Ph.D. degree. In these cases, the testing of proficiency is the responsibility of the department concerned, and no record of the satisfaction of such requirement is filed with the Office of Graduate Studies and Research, or entered on the official record by the Office of the Registrar.

Normative Time Program

All graduate students who first register at UC San Diego in fall quarter 1978 or thereafter and proceed to the Ph.D. are subject to normative time policies. Students who registered in graduate standing at UC San Diego prior to fall 1978 and proceed to the Ph.D. may elect to be included in the normative time program.

Normative time is a standard established for the time period in which students, under normal circumstances, are expected to complete their requirements for the Ph.D. degree in a particular discipline.

Normative times for Ph.D. programs at UC San Diego are listed above.

Students, in consultation with their faculty advisers, should plan their programs of study for completion within the normative time period. Students may continue in a doctoral program after expiration of the normative time period, but registration after twenty quarters will be approved only in exceptional circumstances by the dean of graduate studies.

Normative time 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 "Leaves of Absence," pages 125 and 126.)

In-candidacy educational fee grants are provided to students participating in the normative time program after advancement to Ph.D. candidacy until the accrued time in graduate status exceeds the normative time. (See "In-Candidacy Educational Fee Grant," page 118.)

Normative time policy defines accrued time as elapsed time from first enrollment as a graduate student at UC San Diego, less (a) up to three quarters while on a formal leave of absence; and (b) time between completion of or withdrawal from one graduate program at UC San Diego 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 UC San Diego will not count toward accrued time, with the exception of the EECS programs. All of the following will count toward accrued time: time spent at UC San Diego 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 UC San Diego and re-registration in the same field of study.

A full description of normative

time policies is given in the booklet, *Normative Time to the Ph.D. and Associated Fee Grants*, October 1978, available from the Office of Graduate Studies and Research.

It is likely that there will be some policy changes in the normative time program effective fall 1980. Up-to-date information may be obtained from the Office of Graduate Studies and Research.

Academic Residence

The residence requirement for the doctor of philosophy degree is six quarters, three of which must be in continuous academic residence at UC San Diego. 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," page 125.)

Appointment of Doctoral Committee

At least two weeks prior to a scheduled qualifying examination, the department arranges for the appointment of a doctoral committee. This committee conducts the qualifying examination, supervises 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, and one of these two must be a tenured UC San Diego faculty member.

Reconstituted Doctoral Committee

For a variety of reasons a doctoral committee may have to be

reconstituted. The request for reconstitution of a doctoral committee must be submitted in writing (including departmental affiliation of the members of the reconstituted committee) to the dean of graduate studies by the chairperson of the candidate's major department.

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, and must not have accumulated more than a total of eight units of F and/or U grades, prior to taking the qualifying examination and advancing 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 in the campus publication, *UC San Diego Calendar*.

The Report of the Final Examination and Filing of the Dissertation for the Degree of Doctor of Philosophy is initiated by the department, signed by members of the doctoral committee chairperson of the (major) department and the librarian, and approved by the dean of graduate studies.

The candidate files the dissertation with the university librarian, who accepts it on behalf of the Graduate Council. Acceptance of the dissertation by the librarian represents the final step in the completion by the candidate of all requirements for the Doctor of Philosophy degree.

CANDIDATE IN PHILOSOPHY DEGREE

In several departments, as approved by the Graduate Council, the intermediate degree of candidate in philosophy (C.Phil.) is awarded to students upon advancement to candidacy for the Ph.D. degree. The minimum residence requirement for this degree is four quarters, at least three of which must be spent in continuous residence at UC San Diego. The C.Phil. degree cannot be conferred after or simultaneously with the award of a Ph.D. degree.

POSTGRADUATE APPOINTMENTS

A UC San Diego student is not eligible for any UC San Diego post-graduate appointment until all requirements for the Ph.D. degree have been completed. Such appointments may begin the day after the librarian 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 Biology, Chemistry, and AMES, and (2) interdisciplinary groups of faculty drawn from the School of Medicine and from campus-wide departments.

The following departments or groups provide research training opportunities in the biomedical sciences and should be contacted directly for further information: bioengineering, biochemistry, biology, biophysics, neurosciences, physics, physiology and pharmacology, psychology, and Scripps Institution of Oceanography.

Ph.D.-M.D. Program

Students may meet the requirements for both Ph.D. and M.D. degrees in a program offered jointly by the School of Medicine and the graduate programs in the health sciences. Any student interested in such programs should consult the associate dean for student affairs, School of Medicine. The student must obtain approval of and be admitted to both the School of Medicine and the relevant graduate program. Although most of the work in the first three years of the program normally will be in the School of Medicine, the medical

curriculum provides the opportunity for meeting many of the requirements for the Ph.D. The student must complete requirements for the Ph.D. in accordance with the regulations of a department or group and must in addition meet the requirements for the professional degree.

Accelerated Master's Program in Applied Mathematics

The Department of Mathematics offers an accelerated program in applied mathematics whereby highly qualified juniors may be admitted to graduate standing at the end of their junior year and receive a master's degree at the end of what would have been their senior year.

Juniors with exceptional records in the field of mathematics, who will have successfully completed all requirements for the B.A. in mathematics and the general education requirements of their college by the end of their junior year, may apply for admission to this program with the approval of the chairperson of the Department of Mathematics and the provost of their undergraduate college.

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 UC San Diego, joint doctoral programs in chemistry and genetics* are currently offered in conjunction with San Diego State University. Individuals interested in this joint program should consult the Department of Chemistry or Biology at San Diego State University.

*Pending.

SPECIAL PROGRAMS

Intercampus Graduate Student Exchange Program

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 three weeks prior to the opening of the quarter, a student must complete the Application for Intercampus Exchange Program for Graduate Students. 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 identification card to the Office of the Registrar on the host campus. In turn, the registrar will issue a Student Identification Card for the host campus.

An exchange student is not admitted to graduate standing at the host campus but is considered a graduate student in residence at the home campus. Grades obtained in courses taken by the student enrolled in the intercampus graduate 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.

West Coast Regional Consortium of Universities in the Neurosciences

A consortium of twelve West Coast universities with neurosciences programs exists for the purpose of supplementing predoctoral and postdoctoral student research and training in the neurosciences through short-term utilization of laboratories and/or facilities which are not available at the home institution and may be available at participating universities.

Students who wish to take advantage of the opportunities for specialized training available through the consortium should first discuss their plans with their graduate adviser. Inquiries concerning availability of facilities and faculty time at prospective host campuses may be made to consortium committee members or directly to the faculty of the appropriate programs. Instructions and applications for participation in the Consortium Inter-Campus Exchange Program, and information about possible financial assistance for travel involved may be obtained from the neurosciences graduate program.

The member universities of the consortium are: California Institute of Technology, Stanford University, University of California, Berkeley, University of California, Davis, University of California, Irvine, University of California, Los Angeles, University of California, San Diego, University of California, San Francisco, University of Oregon, Eugene, University of Oregon Health Sciences Center, Portland, University of Southern California, and University of Washington.

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 (five weeks or more). During such periods a student is required to remain a registered student at UC San Diego and to carry nine to twelve units of course work.

If the off-campus study is outside the State of California, one-half of the registration fee may be waived. The full educational fee and student center fee 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 UC San Diego, obtained the approval 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.

University Extension

Through a reciprocal agreement with University Extension at UC San Diego, a limited number of spaces in extension classes are open to registered graduate students without payment of additional fees. The number of spaces available for each quarter varies. The student must obtain a University Extension Application for Enrollment from the Office of Graduate Studies and Research, and personally secure the necessary approvals.

Students wishing to offer University 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.

Education Abroad Program

This statewide program is coordinated on the San Diego campus by the Office of International Education. Study abroad is presently available on campuses in Austria, Brazil, Egypt, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Kenya, Norway, Portugal, Spain, Sweden, the United Kingdom, and U.S.S.R.

A graduate student is eligible for the Education Abroad Program after completion with a B average of one full academic year at a UC campus and two years of university-level work in the language of the country (if applicable). The student must submit an application to the Office of International Education accompanied by required supporting documentation.

Selection procedures involve an interview with members of the coordinating committee for the Education Abroad Program on the student's home campus, the systemwide director of the Education Abroad Program and a final acceptance by the host university.

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

The student must register (pay fees) and enroll at UC San Diego and also enroll at the host university and obtain clearance from UC San Diego's Student Health Service. Full academic credit is received for courses satisfactorily completed.

Complete information and application forms for the various overseas campuses may be obtained from the Office of International Education, International Center, Administrative Complex, Q-018, UC San Diego, or from the Director, Education Abroad Program, 1205 South Hall, University of California, Santa Barbara 93106.

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

Foreign Language Training at the U.S. Defense Language Institute (West Coast Branch)

University of California graduate students who have completed one quarter of graduate work have a unique opportunity to acquire fluency in foreign languages through the cooperation of the U.S. Defense Language Institute in Monterey. Courses in thirty-two languages are available at the institute.

Each year thirty persons certified by the University of California Language Training Advisory Committee are admitted on a space-available basis. Complete information is available from the Secretary, Language Training Advisory Committee, College Eight, University of California, Santa Cruz, California 95064.

Postdoctoral Study

Postdoctoral scholars, trainees, or fellows play a major role in UC San Diego'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 UC San Diego. 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, after which an identification card is issued. The department at UC San Diego may request a Certificate of Postdoctoral Study for the scholar from the Office of Graduate Studies and Research. This certificate will indicate the area of study and the dates enrolled.

FEES

The exact cost of attending the University of California, San Diego will vary according to personal tastes and financial resources of the individual. Each new student entering UC San Diego 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 the current quarterly tuition fee irrespective of the number of courses taken. For the 1980-81 academic year, quarterly expenses may include the following fixed costs:

Fees Per Quarter*

	RESIDENT	NON-RESIDENT
Tuition		\$800
Registration fee	\$131	131
Education fee	120	120
Student Center fee	10**	10**
Students should also be aware of the following charges:		
Application fee for admission		\$20
Changes in Study List after announced deadline dates (Drop/Add Card)		3
Duplicate registration and/or other cards from enrollment packet		3
Duplicate Student ID card		3
Petition for Readmission		20
Removal of Grade "I"		5
Advancement to Candidacy for Ph.D.		25
Transcript of Record		2
Late payment of fees (Late registration)		25
Late filing of enrollment cards (including Preferred-Program Card)		10
Returned check collection		5
Filing fee		65.50

*Subject to change without notice. All receipts for payments made to the cashier, whatever their nature, should be carefully preserved. Not only do they constitute evidence that financial obligations have been discharged, but they may be required to support a claim that certain documents or petitions have been filed.

**Will increase to \$12.50 winter 1981

California Residency and the Nonresident Tuition Fee

Students who have not been residents of California for more than one year immediately prior to the residence determination date for each term in which they propose to attend the university are charged, along with other fees, a nonresident tuition fee of \$800 for the quarter or \$1,200 for the semester. 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.

General

In order to be classified as a resident for tuition purposes, an adult student must have established his or her residence in California for more than one year immediately preceding the residence determination date for the term during which he or she proposes to attend the university and relinquished any prior residence. An adult student must couple his or her physical presence within this state for one year with objective evidence that such presence is consistent with his or her intent in making California his or her permanent home and, if these steps are delayed, the one-year durational period will be extended until BOTH presence and intent have been demonstrated for one full year. Indeed, physical presence within the state solely for educational purposes does *not* constitute the establishment of California residence under state law regardless of the length of his or her stay in California.

Relevant indicia which can be relied upon to demonstrate one's intent to make California his or her permanent residence include, but are not limited to, the following: registering and voting in California elections; designating California as his or her permanent address on all school and employment records, including military records if one is in the military service; obtaining a California driver's license or California Identification Card, if a non-driver; obtaining California vehicle registration; paying California income taxes as a resident, including income earned outside this state; establishing an abode where one's permanent belongings are kept within California; licensing for professional

practice in California; and the absence of these indicia in other states during any period for which residence in California is asserted. Documentary evidence may be required. No single factor is controlling or decisive. All relevant indicia will be considered in the classification determination.

The student must petition to have his or her status changed at the Office of the Registrar at the campus attended, and documentation of residence (driver's license, voter registration receipt, etc.) may be requested at that time.

The residence of the parent with whom an unmarried minor (under age eighteen) maintains his or her place of abode is the residence of the unmarried minor. When minors live with neither parent their residence is that of the parent with whom they maintained their last place of abode. Minors may establish their residence when both parents are deceased and a legal guardian has not been appointed. The residence of unmarried minors who have a parent living cannot be changed by their own act, by the appointment of a legal guardian, or by relinquishment of a parent's right of control.

A man or a woman establishes his or her residence. A woman's residence shall not be derivative from that of her husband, or vice versa.

Exceptions

1. Students who remain in this state after their parent, who was theretofore domiciled in California for at least one year prior to leaving and has, during the student's minority and within one year immediately prior to the residence determination date, established residence elsewhere, shall be entitled to resident classification until they have attained the age of majority and have resided in the state the minimum time necessary to become a resident so long as, once enrolled, they maintain

continuous attendance at an institution.

2. Nonresident students who are minors or eighteen years of age and can evidence that they have been totally self-supporting through employment and actually present within California for the entire year immediately prior to the residence determination date and have evidenced the intent to make California their home may be eligible for resident status.
3. Students shall be entitled to resident classification if immediately prior to the residence determination date they have lived with and been under the continuous direct care and control of any adult or adults other than a parent for not less than two years, provided that the adult or adults having such control have been California residents during the year immediately prior to the residence determination date. This exception continues until the student has attained the age of eighteen and has resided in the state the minimum time necessary to become a resident student, so long as continuous attendance is maintained at an institution.
4. Exemption from payment of the nonresident tuition fee is available to the natural or adopted child, stepchild, or spouse who is a dependent of a member of the United States military stationed in California on active duty. Such resident classification may be maintained until the student has resided in California the minimum time necessary to become a resident. If a student is enrolled in an institution and the member of the military is transferred on military orders to a place outside of the United States immediately after having been on active duty in California, the student is entitled to retain residence classification under conditions set forth above.

5. Students who are members of the United States military stationed in California on active duty, except members of the military assigned for educational purposes to a state-supported institution of higher education, shall be entitled to resident classification until they have resided in the state the minimum time necessary to become a resident.

6. Students who are adult aliens are entitled to resident classification if they have been lawfully admitted to the United States for permanent residence in accordance with all applicable provisions of the laws of the United States and have thereafter established and maintained residence in California for more than one year immediately prior to the residence determination date.

A student who is an adult alien shall be entitled to resident classification if the student is a refugee who has been granted parolee, conditional entrant or indefinite voluntary departure status in accordance with all applicable laws of the United States; provided that the student has lived in the state for one year immediately prior to the residence determination date. (Effective until June 30, 1980.)

7. Students who are minor aliens shall be entitled to resident classification if they and the parent from whom residence is derived have been lawfully admitted to the United States for permanent residence, provided that the parent has had residence in California for more than one year after acquiring a permanent resident visa prior to the residence determination date for the term.

A student who is a minor alien shall be entitled to resident classification if the student is a refugee who has been granted parolee, conditional entrant or indefinite voluntary departure

status in accordance with all applicable laws of the United States; provided that the student has lived in this state for one year immediately prior to the residence determination date. (Effective until June 30, 1981.)

8. Children of deceased public law enforcement or fire suppression employees, who were California residents, and who were killed in the course of law enforcement or fire suppression duties, may be entitled to resident classification.

Procedures

New and returning students are required to complete a Statement of Legal Residence. The student's status is determined by the attorney in residence matters' deputy who is located in the Office of Admissions and Records.

Students are cautioned that this summation is not a complete explanation of the law regarding residence. They should also note that changes may have been made in the rate of nonresident tuition and the residence requirements between the time this catalog statement is published and the relevant residence determination date. Regulations have been adopted by the Regents, a copy of which is available for inspection in the Office of Admissions and Records.

All students classified incorrectly as residents are subject to reclassification and to payment of all nonresident fees not paid. If incorrect classification results from false or concealed facts by the student, the student also is subject to university discipline. Resident students who become nonresidents must immediately notify the attorney in residence matters' deputy.

Inquiries from prospective students regarding residence requirements for tuition purposes should be directed to the Attorney in Residence Matters, University of California, 590 University Hall, Berkeley, California 94720. No other university personnel are authorized

to supply information relative to residence requirements for tuition purposes. Any student, following a final decision on residence classification by the residence deputy, may make written appeal to the attorney in residence matters at the above address within 120 days after notification of the final decision by the residence deputy.

Waivers of Nonresident Tuition

To the extent funds are available, nonresident tuition waivers may be granted to spouses and dependent, unmarried children under twenty-one of university faculty members who are qualified for membership in the Academic Senate; to the unmarried, dependent children under age twenty-one of a full-time university employee whose permanent assignment is outside California and who has been employed by the university for more than one year immediately prior to the opening of the term; and for certain foreign students. Inquiries regarding these waivers normally should be directed to the dean of the graduate division of the campus the student proposes to attend.

In addition, certain student teaching assistants and teaching fellows, and certain graduate students designated as University Fellows and Distinguished Scholars may be eligible for nonresident tuition waivers as a form of financial aid. Such students should contact the Financial Aid Office at their campus for further information.

University Registration Fee

The university registration fee is a quarterly fee required of all students regardless of number of courses taken. It must be paid at the time of the student's registration. This fee covers the use of recreational facilities and equipment, certain costs of the International Center, Student Employment Service, Crafts Center, Student Information Center, Arts and Lectures programs, and

such medical consultation, dispensary treatment or hospital care as can be furnished by the Student Health Service or by health and accident insurance purchased by the university. No part of this fee is refunded to students who do not make use of these privileges. Exemption from this fee may be granted to surviving children of certain deceased California firemen or policemen. Students who believe they may qualify for an exemption on this basis must consult with the Student Financial Services Office, Building 214, Administrative Complex, for a ruling.

Reduced Registration Fee

One-half of the established registration fee may be waived for graduate students:

1. 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.
2. Who are full-time employees of the university, as provided for in the University of California's Staff Personnel Policy 260. 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 UC San Diego 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.

The reduction pertains to one-half of the registration fee only. A student must pay, in addition, applicable educational and student center fees.

Educational Fee

The educational fee was established as a required fee for all students beginning with the fall quarter, 1970. Resident students with demonstrated financial need, who are enrolled in at least six units of course work, may defer payment of the educational fee by accepting an obligation to repay, at a later date, the sum deferred. Students interested in this provision should communicate with the Student Financial Services Office, Building 214, Administrative Complex, at least two months before the first day of the quarter.

In-Candidacy Educational Fee Grant of \$120

(see Normative Time Program, complete information.)

The normative time program provides an in-candidacy educational fee grant each quarter (currently \$120) for students who have advanced to candidacy for the Ph.D. degree. When the individual's accrued time exceeds the normative time established for that degree by the major department or group, the candidate will resume paying full fees. Students who remain under old policies will not be eligible for this fee grant.

Student Center Fee

Every student is required to pay a student center fee each quarter.

Filing Fee

A student on an approved leave of absence who has completed all requirements except for the final reading of his or her dissertation or thesis or the taking of the final examination is eligible to petition to pay a filing fee in lieu of registering and paying all required fees in the final quarter. The filing fee applies to both residents and nonresidents. Students must apply for this privilege by means of a General Petition.

Refund of Fees

Students who withdraw from the university during the first five weeks of instruction may receive partial refunds of registration fees. 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 on Campus," page 146, in chapter entitled "Campus Services and Facilities.")

Penalty Fees

Penalty fees are charged for failure to comply with normal deadline dates. To avoid such penalties, students should fulfill all requirements in advance of the deadlines listed in the Academic Calendar.

Transcript of Records

Students may obtain transcripts of their UC San Diego records from the Office of the Registrar for \$2 for the first copy, \$1 for each additional copy ordered at the same time. Transcripts must be requested several days in advance of date needed.

FINANCIAL ASSISTANCE

Types of Financial Assistance Available

Several kinds of financial assistance are available to graduate students at UC San Diego. 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 the department offices.

Descriptions in this section deal entirely with awards administered directly by the university. By appointment or award is meant employment for compensation, fellowship or scholarship-type awards, or any other formally recognized educational benefits.

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

Fellowship and traineeship stipends are tax-free awards granted for scholarly achievement and promise which enable full-time students to pursue graduate studies and research leading to an advanced degree. Part-time students and non-degree students are not eligible.

Stipends range from \$3,600 to \$5,040 and, unless otherwise stated, do not include tuition or fees in addition to stipends. Appointees must register for and complete a full program of graduate study and research each quarter (nine to twelve units of upper-division and graduate-level work) and must remain in good academic standing, as described under "Standards of Scholarship."

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.

Fellows and trainees may not engage in remunerative employment without the prior approval of the dean of graduate studies. Many fellowships and traineeships offer the privilege of participation in the teaching programs of the university.

The principal types of fellowships at UC San Diego are the following:

1. Graduate Opportunity Fellowships.
2. Regents Fellowships.
3. San Diego Fellowships.
4. Fee Scholarships.
5. Tuition Scholarships.
6. Tuition and Fee Scholarships.
7. U.S. Public Health Service Predoctoral Traineeships.
8. Dissertation — Research Assistantships (California residents only).
9. Dissertation Fellowships (California residents only).

Assistantships

Graduate students may be employed by UC San Diego on a part-time basis (not to exceed 50 percent time) as research assistants, teaching assistants, and language assistants. Assistantships do not include payment for tuition or fees and are subject to tax withholding for salaries received. To qualify for possible tax exemption, the student must be in a degree program in a department or group which requires all candidates for the degree to perform equivalent research and/or teaching, whether or not compensated. Teaching assistants must also be enrolled in

a 500 series teaching course to be eligible for a tax certification by the university. Eligible students, upon request to their major departments, may obtain tax certificates for submission to the Internal Revenue Service. Final decision on tax exemption rests with the Internal Revenue Service.

Exemption from withholding of federal income tax may be claimed on Form W-4, Employee's Withholding Allowance Certificate, if no tax liability was incurred the previous year and no tax liability is anticipated during the current year, i.e., (1) gross income is \$3,300 or less if single, or (2) combined gross income of married graduate student and spouse is \$5,400 or less. This exemption must be revoked by filing a new Form W-4 either (1) within ten days from the time federal income tax liability is incurred for the year, or (2) on or before December 1 if it is anticipated that federal income tax liability will be incurred for the next year. A certificate for exemption from withholding will expire on April 30 of year following unless a new Form W-4 is filed before that date. (See Form W-4 for further details.)

Appointees are required to register for and complete a full program of graduate study and research each quarter (nine to twelve units of upper-division and graduate-level work) leading to a higher degree and must remain in good academic standing, as described under "Standards of Scholarship," page

Application Procedures

Entering students may obtain application materials with instructions from academic department or group offices. Only one application form is needed to apply for admission and for any of the following: fellowships, traineeships, scholarships, and assistantships (teaching, language, or research).

An applicant who plans to seek fellowship assistance should submit

scores on the verbal and quantitative tests of the Graduate Record Examination (GRE), a national test for admission to graduate school. It is administered several times a year throughout the United States and at centers in ninety-six countries by the Educational Testing Service. See Academic Calendar for examination dates. Direct inquiries to the Graduate Record Examinations, Educational Testing Service, Princeton, New Jersey 08541.

In order for a student 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, including scores of the Graduate Record Examination, must be received by the Office of Graduate Studies and Research by January 15. No assurance can be given that such applications can be processed after January 15. Applications for assistantships may be accepted after that date, but many departments offer assistantships at the same time they consider applications for fellowships. Therefore, applicants for such appointments are strongly urged to submit their applications as early as possible.

Continuing and returning students should consult with their departments.

The awarding of fellowships and similar awards for the following academic year will be announced not later than April 1. UC San Diego 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 to not accept another appointment without first obtaining formal release for that purpose.

Loans and Grants-in-Aid

See section on financial assistance in chapter entitled "Campus Services and Facilities."

Time Limits for Graduate Student Support

A graduate student may not serve as a teaching assistant, language assistant, or a reader on an annual stipend (or any combination of these titles) for more than four years. In addition, the total length of time for all financial support provided by UC San Diego (excluding loans) may not exceed six years for a Ph.D. candidate, ten quarters for a master of fine arts candidate, or seven quarters for a master of science or master of arts candidate.

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 UC San Diego are urged to consult one of the many directories available through the reference departments of large libraries in the United States, or the fellowship adviser in the Office of Graduate Studies and Research, Building 103, Administrative Complex. Most application deadlines occur in the fall or early winter. Among the many organizations which have awarded fellowships to students at UC San Diego are the National Science Foundation, the United States Public Health Service, the Danforth Foundation, the Hertz Foundation, IBM, and the Kennecott Copper Corporation.

California residents may apply for a California State Graduate Fellowship to assist in payment of the university registration fee, the student center fee and the

educational fee. The deadline for application is usually in January, and application materials and additional information can be obtained from departmental offices, or the Office of Graduate Studies and Research.

GENERAL POLICIES AND REQUIREMENTS

Integrity of Scholarship

Graduate students are apprentice members of the academic profession and are expected, therefore, to adhere to the highest standards of academic integrity and honesty. University policy on the integrity of scholarship is described on page 92.

Student Conduct

Graduate students enrolling in the university assume an obligation to conduct themselves in a manner compatible with the university's function as an educational institution. Rules concerning student conduct, student organizations, use of university facilities, and related matters are set forth in *Policies Applying to Campus Activities, Organizations, and Students, University of California, Parts A and B (revised July 21, 1978)*, and in the *UC San Diego Non-Academic Student Conduct Code of Procedures, August 24, 1979*, copies of which are available at the Office of Graduate Studies and Research.

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 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," pages 101-103.

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

1. The student feels that due process was not followed in arriving at a decision which resulted in disqualification.
2. The student feels 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.

GRADES

Standards of Scholarship

Only upper-division and graduate courses in which grades of A, B, C, 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 and graduate courses. Lower-division course units are not used in computing a graduate student's grade-point average since such courses may not be offered in satisfaction of program requirements for a higher degree. Grades of S, U, I and IP, as well as NR, are excluded in computing a grade-point average.

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 who has not advanced to candidacy. These evaluations are designed to inform students of their individual strengths, weaknesses, and 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 for good standing including a satisfactory pre-candidacy spring evaluation, maintain a GPA of 3.0 in upper-division and graduate 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 UC San Diego.

Graduate students who are not in good standing for any reason are subject to probation and/or disqualification from further graduate study.

Grading System

Grades and grade points are described as follows:

A	Excellent	4.0 grade points/per unit
B	Good	3.0 grade points/per unit
C	Fair	2.0 grade points/per unit
D	Barely Passing	1.0 grade point/per unit
F	Failure	0 grade points/per unit
I	Incomplete but work of passing quality (lapses to F or U if not made up by last day of finals week in the following quarter)	No grade points
IP	In Progress (provisional grade; replaced when full sequence is completed)	No grade points
S	Satisfactory (equivalent to B or better)	No grade points
U	Unsatisfactory	No grade points

All grades except *incomplete* and *in progress* are final when filed in an instructor's course report 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 or F grades in upper-division or graduate course work may not be eligible to continue on appointment and may be subject to academic probation or dismissal.

No Report

An NR listed on a transcript is a computer-produced abbreviation assigned by the registrar indicating that the student was listed on a

course report, but no grade was turned in by the instructor; or that the assigned grade did not agree with the grading option. When an NR appears, the student should take steps immediately to remove the NR entry from his or her record. An NR which has not been removed by the last day of finals week in the quarter after it was assigned shall lapse automatically into an F or U grade and shall be treated accordingly.

I (Incomplete) Grade

An I is assigned when work is of passing quality but incomplete for reasons beyond the student's control, e.g., illness. An I grade may be replaced upon completion of the work but no later than the last day of finals week in the following quarter. If not replaced by this date, the I grade shall lapse into a F or U and shall be treated accordingly.

Incomplete grades assigned in the quarter before a graduate student withdraws or takes an approved leave of absence remain as such until the end of the next quarter in which the student registers and pays fees.

To Remove an I (Incomplete) Grade

The student must obtain a petition, Removal of Incomplete Grade form, from the Office of the Registrar, secure appropriate signatures, and pay the required fee. The approved petition must be filed with the Office of the Registrar no later than 4:30 p.m. on the last day of finals week in the next quarter in which the student is registered.

IP (In Progress) Grades

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 final course. A student who has dropped out without completing the entire sequence may be assigned final

Graduate Studies

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 as F's or U's.**

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 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 their work in any upper-division course, or in a graduate course outside their major department graded on an S/U basis; also, 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. Additionally, all lower-division course work and noncredit courses shall be graded only on an S/U basis.

Selection of an S/U 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*.

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 and used in calculating the overall grade-point average.

Final Grades

A copy of the transcript is sent to each student at the end of every quarter. While course reports submitted by instructors at the end of the quarter are generally considered final, **students should carefully examine their transcript for omissions and clerical errors and consult with instructors and the Office of the Registrar to clarify any discrepancies.**

Grade appeals

UC San Diego has adopted a procedure for grade appeals. The policy which pertains to undergraduates and graduates is outlined in full on pages 101-103.

Teaching

Some departments require all students seeking a graduate degree to participate in the teaching program of the department and to enroll in a teaching course in the 500 series. The nature and extent of the duties required for each department are described under "Courses, Curricula and Programs of Instruction." Teaching units are not considered an overload on study-list limits.

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 any 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 3.0.

ADMISSION REQUIREMENTS

Academic

Applicants for graduate admission must present official evidence of receipt of a baccalaureate degree from an accredited institution of higher learning or the equivalent, with training comparable to that provided by the University of California. A scholastic average of B or better in upper-division courses, or prior graduate study is required.

The Graduate Record Examinations (GRE)

All applicants who wish to be considered for fellowships or graduate scholarships are required by the Graduate Council to submit scores from the Aptitude Test of the Graduate Record Examinations. Moreover, most departments and groups at UC San Diego require or recommend that applicants submit GRE test scores in support of their applications for admission.

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 the University of California, San Diego; application for admission must be made to a specific department or group. Applicants who wish to take "course work only" within a department or group and who do not intend to pursue a higher degree at UC San Diego 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 nine upper-division or graduate units per quarter are considered part-time students. Applicants desiring admission as part-time students must satisfy all admission requirements, pay the same fees as full-time students, and may not hold fellowships or 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" to determine the proper time to apply.

All other applicants should ask their prospective major departments for this information.

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 or group or the Office of Graduate Studies and Research may defer action upon an application until a supplementary record or evidence of the receipt of a degree becomes available.

How to Apply

Applicants must complete an Application for Graduate Admission and Award and forward it, together with a non-refundable application fee of \$20, to the Office of Graduate Admissions, Q-003, UC San Diego, La Jolla, California 92093. (Only one application is needed to apply for admission and for fellowships, traineeships, scholarships, or assistantships.) Detailed instructions as to how to complete the application appear on the cover of the application packet. Listed below are the documents which are required in support of an application for graduate admission.

Required Supporting Documents

All supporting documents — except letters of recommendation — should be forwarded to the Office of Graduate Admissions, Q-003, UC San Diego, La Jolla, California, 92093. Letters of recommendation should be forwarded directly to the applicant's prospective major department or group.

Academic Records — Applicants should 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 the Office of Graduate Admissions. (Transcript labels are enclosed in the application packet.) 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 UC San Diego must

submit evidence of degree conferral (as well as a final academic record) as soon as it is 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 preferred. 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, English translations must accompany official documents in their original language.

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 or rank in class if possible.

Graduate Record Examinations (GRE) Scores — Applicants who are applying for admission to a department or group which requires that they take the GRE (see graduate brochure, *Applying for Graduate Study*) should do so as early as possible to insure the timely receipt of their score results. **Fellowship and scholarship applicants must arrange to take the GRE no later than December in order to meet the January 15 deadline** (see Academic Calendar). The GRE is administered six times a year in the United States and five times a year in ninety-six other countries. Applications may be obtained from the Educational

Graduate Studies

Testing Service, Box 955, Princeton, New Jersey 08541.

Letters of Recommendation

Applicants should arrange to have three letters of recommendation forwarded directly to their prospective major department or group. (Recommendation forms are enclosed in the application packet.) 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 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 UC San Diego. 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 enclosed in the application packet and must be returned with the application. A written summary of present and future financial resources must be provided before admission and 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.

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. The TOEFL is offered four times a year at centers throughout the world. Arrangements for taking the TOEFL may be made through the nearest United States Embassy or by writing to the Educational Testing Service, Box 899, Princeton, New Jersey 08541.

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 UC San Diego and to enroll in an English course until the required proficiency is attained.

ADMISSION AND REGISTRATION

Official admission to graduate study at the university is contingent upon review of an applicant's record, an affirmative recommendation by the prospective department or group, and action by the Office of Graduate Studies and Research. The dean of graduate studies or the prospective major department or group may deny admission if an applicant's scholastic record is undistinguished, if the preparation is judged inadequate as a foundation for advanced work, or if the department's or group's facilities are already filled to capacity. Only the official Certificate of Admission from the dean of graduate studies constitutes formal approval of admission to a graduate program at UC San Diego.

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 departments or groups 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 and group offices approximately two weeks before the opening of the quarter (see Academic Calendar).

Reapplication

Students who fail to register in the quarter for which they first applied 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. Application for admission after this period may be made only by completing a new application and providing all necessary documents.

Medical History Forms

All new students, graduate or undergraduate, and all students returning to the San Diego campus after an absence of three or more successive quarters, must submit a completed medical history form to the Student Health Service.

Entering students are required to complete a medical history form prior to registration and to send it to the Student Health Service. A report of a tuberculin test must be submitted also. In addition, students are urged to submit a physical examination form completed by their family physician, particularly if they plan to take part in intercollegiate athletics. Information sent to the Student Health Service is held confidential

and is carefully reviewed to help provide individualized health care. Routine physical examinations are not provided by the Student Health Service.

Information and required forms are mailed to all new students by the Student Health Service well in advance of registration.

Readmission

A graduate student whose status has lapsed because of an interruption in registration must petition for readmission at least eight weeks prior to the first day of the quarter in which he or she wishes to re-enroll. Students must submit supplementary transcripts of all academic course work undertaken since last enrolled at UC San Diego, pay a readmission fee of \$20, complete a General Petition and a 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

NOTE: Deadlines differ for new and continuing/returning students. Consult the Academic Calendar.

New students must enroll and pay fees on or before the deadline dates set for registration of new students each quarter. Enrollment packets may be picked up at the major department after the student arrives on campus.

Continuing and returning students must enroll and pay fees during the period designated by the Office of the Registrar; enrollment packets are sent directly to the departments. (See *Schedule of Classes* for current deadlines.)

Full-Time Student

A full-time student is required to be registered for nine to 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 nine units a quarter but is admitted as a regular student and **must pay the same fees as a full-time student.**

Continuous Registration

All full-time and part-time 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 UC San Diego and will be dropped from the official register of graduate students. 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 non-refundable readmission fee, and be considered for readmission with all others requesting admission to that quarter.

Ph.D. degree candidacy will lapse for graduate students subject to normative time policies 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.

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.

Registration Procedures

A student is not officially registered for classes until the entire registration procedure outlined below has been completed **each quarter.**

1. Using the current copy of *Schedule of Classes* available from the University Bookstore, complete the Preferred-Program Card and all other forms in the registration packet.
2. Secure graduate adviser's signature on completed Preferred-Program Card.
3. File completed registration packet including Preferred-Program Card with the Office of the Registrar prior to the deadline date.

NOTE: Deadlines differ for new and continuing/returning students. See Academic Calendar and *Schedule of Classes*.

4. **Pay required fees to the Office of the Cashier prior to the registrar's deadline date. When paying fees, present the Fee Card enclosed in registration packet together with Student Identification Card for validation.**

Late Registration

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

A \$10 late filing fee will be assessed if a student does not

Graduate Studies

enroll (file the enrollment packet with appropriate signatures) with the Office of the Registrar, Building 101, Administrative Complex, by the deadline dates published in the Academic Calendar and in the *Schedule of Classes*.

Additionally, a \$25 late registration fee will be assessed if the student has not completed registration (paid fees) prior to 3:00 p.m. on the deadline for completing registration as outlined in the Academic Calendar and the *Schedule of Classes*.

A student who has not completed registration (enrolled and paid fees, including late fees if required) by the registrar's deadline date **must petition for permission to register late**.

Student Identification Card

A validated Student Identification Card entitles the student to library privileges, a student health card and use of other university facilities. If the card is lost, a duplicate may be obtained from the Office of the Registrar (see "Fees," page 93). Identification cards must be surrendered to the Office of the Registrar by students petitioning to withdraw or to go on leave of absence.

UC San Diego graduate students working on campus during summer months may request Temporary Student Identification Cards from their departments.

Changes of Name or Address

Students must file official change of name or address forms with the Office of the Registrar when applicable.

Preferred-Program Card

A student must complete the Preferred-Program Card included in the registration packet, listing correct course codes for all course work, independent study, or research to be undertaken for each quarter of registration; and the

Preferred-Program Card must be approved by the graduate adviser and filed with the Office of the Registrar. Following enrollment, each student will receive confirmation of class enrollments on an official Study-List Card. Only successfully completed course work appearing on the Study-List Card will be credited toward a degree. Unofficial withdrawal from a course listed on the Study-List Card will result in a failing grade.

Study-List Limits

A graduate student in a regular quarter is limited to sixteen units in undergraduate courses or to twelve units in graduate courses, or to a total made up of twelve to sixteen in proper proportion — i.e., six graduate and eight undergraduate, when taking both undergraduate and graduate courses. 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 or less appointments as research assistants, teaching assistants, language assistants, readers, and 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 a full-time program of graduate study and research (nine to twelve units each quarter).

Teaching units (500 series) above the maximum are not considered an overload.

Changes in Study Lists

After the Preferred-Program Card has been filed with the registrar, a student may add or drop courses or change sections of a given course during the first and second week of classes without fee by completing a Drop/Add Card, available at the Office of the Registrar, with the approval and signature of the student's adviser. (See *Schedule of Classes*, "Change of Program.") If a

change is being made from a letter grade to or from S/U, the instructor's signature is required. Drop/Add Cards must be completed in full and must include identical course information as listed in the *Schedule of Classes* including corresponding course codes. When changing units in a variable-unit course, a student must drop the course first, then add it with the correct number of units.

If a change is made in the third or subsequent weeks, the student must complete both sides of a Drop/Add Card, secure the appropriate signatures and approval of the dean of graduate studies, and pay a fee to the cashier.

Drop/Add Cards reflecting changes in study lists 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.

Leave of Absence/Extension

A student who discontinues graduate study with the intention of resuming during a later quarter must file a formal Leave of Absence, Extension and/or Withdrawal form, prior to leaving the campus. Whether or not the student is participating in the normative time program will determine the length of leave(s) which can be approved. Graduate students participating in the normative time program, who first registered at UC San Diego prior to fall quarter 1978 are limited to a maximum of three quarters of leave after fall 1978. For those doctoral students who elected not to participate in the program, the dean of graduate studies may grant a request for an extension beyond three years with a supporting letter from the chairperson of the department or group. Students entering as graduate students beginning fall quarter 1978 and thereafter are subject to provisions of the normative time program if they proceed to a Ph.D. degree and

are limited to a maximum of three quarters of leave (See "Normative Time Program," pages 110 and 111.)

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 the approval of the graduate adviser and the chairperson of the (major) department or group, receive clearance from Special Services, Student Financial Services, Office of the Cashier, and Loan Records Office, and obtain approval of the dean of graduate studies. If a student has registered for the quarter in which a leave is being requested, the validated Student Identification Card must be attached to the leave of absence.

A student who has a long-term loan is considered out of school while on 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 may request an extension of an approved leave *prior to the expiration of the leave*. (See "Normative Time Program," pages 110 and 111.)

A student who has not completed one quarter or more of academic residency or who is not in good academic standing will not be permitted to take a leave of absence but must withdraw.

A new Statement of Legal Residence is required for all graduate students **returning from a leave of absence of two quarters or more**. In addition, a student who has been on leave of absence for three or more consecutive quarters must be cleared by the Student Health Service prior to re-enrolling at UC San Diego.

A student on leave of absence status may not make use of university facilities, nor place any demands upon faculty including discussion of dissertation work (either directly or by correspondence) during the period of the leave.

A student on leave of absence cannot be employed at UC San Diego, University Hospital, or

University Extension in any capacity and may not hold a fellowship, traineeship, or similar appointment administered by the university.

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 Student Identification Card surrendered.

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 will receive a grade of F or U in each course, thus jeopardizing eligibility for readmission.



Bar from Registration/Non-Academic

After suitable warning, a student may be barred from further registration for a variety of non-academic reasons, including failure to comply with official notices, to settle financial obligations when due, to complete medical examination requirements, 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.

APPENDIX

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 UC San Diego students are listed here.

Graduate Record Examinations (GRE)

Address: Graduate Record Examinations, Box 955, Princeton, New Jersey 08541.

Purpose: To appraise intellectual qualification of candidates for admission to graduate study and to help sponsors of fellowship

programs select the recipients of their awards.

Application: Information and forms are available at the Office of the Registrar, UC San Diego, or the above address.

Applications must be submitted to Educational Testing Service (see above for address) at least *four weeks* prior to scheduled examination dates in the United States and Puerto Rico and at least six weeks in all other countries. In an emergency, it may be possible to take the GRE without registering beforehand.

Examination Schedule: Six times a year in the U.S.; five times a year in ninety-six countries; several additional times a year in eight major U.S. cities (dates change each year.)

Fee: Aptitude	\$14*
One Advanced Test	14*
Late Registration	
Penalty	5*

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 written 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, 560 Library East, 5300 Campanile Drive, San Diego 92182. Telephone: 265-5216.

Applications must be submitted to the university administering the examination at least one month prior to scheduled examination dates.

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

Fee: \$3*

*Subject to change

Miller's Analogy Test (MAT)

Address: The Psychological Corporation, 304 East 45th Street, New York, New York 10017.

Purpose: A high-level mental test which provides information to support candidates for admission to graduate study.

Application: Information and applications are available from the above address or from the San Diego State University Testing Office, 560 Library East, 5300 Campanile Drive, San Diego, California 92182. Telephone: 265-5216.

Examination Schedule: The third Thursday of every month at 3:00 p.m. at San Diego State University. Student should arrive at least thirty minutes prior to exam to pick up and take reservation card to bookstore cashier's office to pay the fee.

Fee: \$6.50*

Test of English as a Foreign Language (TOEFL)

Address: Box 899, Princeton, New Jersey 08541.

Purpose: To help foreign students demonstrate their English language proficiency at the advanced level required for graduate study.

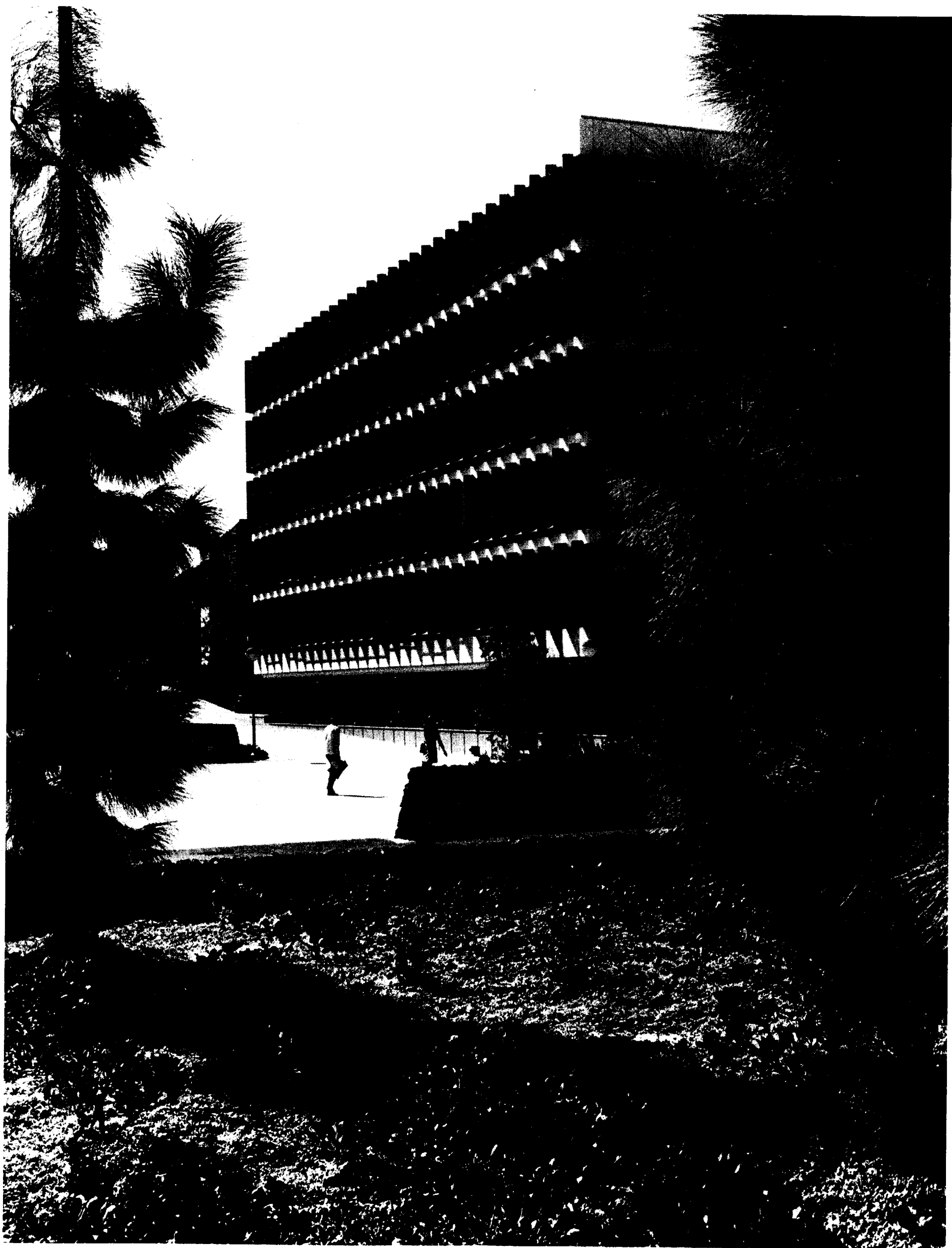
Application: Information and forms are available from the above address; United States embassies, consulates, and related centers; and the San Diego State University Testing Office, 560 Library East, 5300 Campanile Drive, San Diego 92182. Telephone: 265-5216.

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

Examination Schedule: Four times a year (dates change each year) in about 125 countries.

Fee: \$19*

*Subject to change.



Campus Services and Facilities

A broad range of special services and facilities is available to students at UC San Diego, undergraduate and graduate alike. (Services limited to graduate students will be found in the Graduate Studies section.)

ACADEMIC SERVICES AND PROGRAMS

OASIS (Office of Academic Support and Instructional Services)

OASIS provides UC San Diego students, faculty, and staff with various academic services designed to improve students' skills and the teaching-learning process. Although OASIS is primarily known for its ability to provide students with tutors, the program is also effective in other areas: reading, study skills, test scoring services, research and evaluation, diagnostic testing, and peer counseling.

All students in any of the four colleges are eligible for OASIS programs. Classes are noncredit and may be repeated. Course titles and schedules are printed in the *Schedule of Classes* and campus media. Student services are available in four locations: the Underground, the Second Story, the Third Place, and the OASIS main office.

Tutorial Programs

OASIS provides free tutoring in lower-division biology, chemistry, physics, mathematics, history, psychology, economics, political science, and statistics. Tutors are available on a drop-in basis or by appointment, with emphasis on helping the student become an independent learner. Most of the tutorial services are located in the Underground. However 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
1254 Humanities
Library Building
Extension 2280*

The Academic Skills Program (ASP)

ASP coordinates service to all EOP students and provides OASIS's Peer Counseling Service and self-development workshops. An in-depth interview, analysis of academic background, and diagnostic testing lead to an individualized program and a contract for various OASIS services. In addition, ASP coordinates an intensive four-week residential Summer Bridge Program for entering EOP freshmen. Students attend classes in mathematics and

writing and receive assistance in improving reading speed and comprehension as well as study skills. A variety of cultural and personal development activities are coordinated with these academic programs to provide a smooth transition from high school to UC San Diego.

*OASIS Main Office
Building B, Student Center
Extension 3760*

Reading and Study Skills Program

This program offers three regularly scheduled five-week reading classes. *Basic Reading Improvement* includes word attack skills, phonics, and root words as well as techniques for careful reading for understanding. A comprehension workshop covers in-depth comprehension, paragraph structure, vocabulary development, main ideas, and evaluation. There is some emphasis on speed and accuracy. *Speed Reading* includes efficient habits, rhythmic eye movement, paragraph structure, and reading with a purpose. Extension credit is available if desired. *Study Skills* assistance is provided in a mini-session format and covers topics such as time management, note taking, and test anxiety.

Writing Center

This program helps students improve their writing skills and strategies in a range of different writing situations — the essay-exam, the lab report, term and research papers — and across disciplines from science to literature. Classes are small and collaborative. Writers share their writing, discuss their opinions about writing, and learn to edit effectively. Special class sessions are held as adjuncts to the freshman writing courses and other UC San Diego courses, in collaboration with faculty. In addition, drop-in conferences are available from 8:00 a.m.-4:30 p.m., Monday through Friday.

*The Second Story
Rooms 4010 and 4070
Undergraduate
Sciences Building
Extension 2284*

The Test Scoring Service

Multiple choice test scoring is provided to faculty and staff without charge. Participating faculty use OASIS computerized answer sheets and are provided a report of each student's score, class average and distribution of scores, and item analyses which facilitate test revision.

Research and Evaluation Program

This program coordinates evaluation activities that are essential to the provision of effective services to students. All OASIS programs are evaluated each quarter and the results are used to make improvements in service for the following quarter as well as for long-range planning. Evaluation activities examine the characteristics of the students served, the type of service provided, student opinion of services, and the outcome of service.

Research activities examine a particular problem or issue related

to OASIS services. Research projects have included the relationship between high school quality and UC San Diego 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 is undertaken, such as follow-up studies on the retention of Academic Skills Program and EOP students.

The OASIS Data Base provides the foundation of much of the research and evaluation activities. Research and evaluation reports are printed, bound, and distributed to interested persons or groups. These reports also provide much of the information necessary to various funding sources.

The University Library

The UC San Diego library consists of the Central University Library, five branch libraries (the Science and Engineering Library, the Biomedical Library, the San Diego Medical Society-University Hospital Library, the Scripps Institution of Oceanography Library, and the Cluster Undergraduate Library), and the Slide Collection. It has been described as "... one of the best million-volume academic libraries anywhere."

Combined UC San Diego Library Statistics, 1979

Volumes:	1,332,525
Periodical and other serial publications received:	25,648
Government documents:	213,962
Manuscripts:	630,570
Maps:	156,677
Microforms:	671,870
Phonorecords, tapes, cassettes:	21,855
Slides:	89,491

The library is a center for study, reading, and scholarship at UC San Diego. Its collections and services are basic resources supporting undergraduate and graduate instructional programs; it also houses materials necessary for advanced research by faculty and others. The library units are organized and staffed to meet these academic objectives. While each library may have varying rules, all are open to — and welcome — all members of the UC San Diego community.

Major libraries like UC San Diego can be seen as complex institutions. Reference services therefore exist 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 readers information and courses on its effective use. The Contemporary Issues 50 course ("Information and Academic Libraries") of Muir College is one example. Individual and group tours of individual libraries can be arranged through the reference librarians.

The Interlibrary Loan Service locates and borrows materials not held at UC San Diego. This service is available to undergraduates as well as other UC San Diego readers. Our students enjoy direct borrowing privileges at the other UC campuses. A small jitney bus that makes a daily round trip to the UCLA library is available to members of the UC San Diego community as space allows.

The Computerized Literature Searching 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 on desired topics. Contact the reference departments of the Central

Campus Services and Facilities

University Library or any science library for this service and the procedure for using it.

The Central University Library houses the general and specialized research collections in the social sciences, the humanities, and the fine arts. Its Reference Department contains an outstanding collection of bibliographies, indexes, encyclopedias, biographical directories, and other tools. Its 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 and the large microfilm and other microforms holdings. A listening facility in the Music Department serves music instruction and research. The Mandeville Department of Special Collections includes rare books and other materials requiring special care. Mandeville's rapidly growing resources encompass materials in four categories: by *area*: Baja California, local history; by *authors*: Laurence, Yeats, Hemingway; by *subject*: Renaissance, Pacific Voyages, Spanish Civil War, and by *form*: Archive for New Poetry.

The Science and Engineering Library, in Urey Hall, contains strong collections in the physical sciences and technology (105,897 v.). Of particular importance are its research materials in aeronautics, astrophysics, atomic energy, chemistry, computer science, electronics, engineering, instrumentation, mathematics, missiles research, physics, space sciences, and nuclear energy.

The Biomedical Library, in the Basic Science Building of the School of Medicine, contains research collections in biology and medicine (132,763 v.). A branch of the Biomedical Library is maintained at the University Hospital (19,163 v.).

The Scripps Institution of Oceanography Library is

considered to be one of the two greatest libraries in its field in the world (126,261 v.). It has outstanding collections in marine biology, oceanography, and underseas technology, and also specializes in geology, geophysics, and zoology publications.

The Cluster Undergraduate Library, in the Humanities-Library Building, has a general collection (72,747 v.) especially tailored to serve the basic needs of undergraduates. Its Playback Center is designed for the performance of audiovisual materials that faculty are using in their classes.

The Slide Collection, located in the Mandeville Center, has been developed to provide visual materials for on-campus instructional purposes. The collection of nearly 90,000 slides covers all periods of art history in architecture, sculpture, painting, and the minor arts.

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

The Computer Center

The UC San Diego Computer Center operates three major computer systems located on the first floor of the AP&M Building in Muir College. The Burroughs B7800 computer offers a wide variety of programming languages and classes of service, and may be reached either by coming to the AP&M Building, or by means of a variety of remote terminals. General academic computing is provided on a VAX 11/780. Support for text editing and photo composition is supplied by a PDP 11/70 using the UNIX system. Users may also use a variety of computers located at other universities, including the IBM 360/75 at UCSB and the CDC 7600 at Lawrence Berkeley Laboratory.

The center's facilities are used to support instruction, research, and administrative activities. Most students and research staff

members do their own programming. Open shop access is available via the input/output stations or remote terminals. (Computer terminals for interactive use are available in the Computer Center classroom, Room 125, Communications/Media Center, Third College; Building 406, Warren College; and in the Playback Center, Cluster Library.) Large jobs are run under the control of a professional operations staff. Noncredit programming courses are offered at frequent intervals and at various levels of sophistication. These courses supplement the programming instruction available in the credit courses offered by many departments. The center provides a consulting staff to aid users on special problems. Documents are available on most of the center's many facilities. The larger manuals are sold through the campus bookstore, while smaller write-ups are available at no charge through the center's consulting office or the on-line documentation facility.

The Computer Center regularly has a need for a small staff of student programmers, generally to work on the maintenance or development of large system programs, or utility library programs. Occasionally, part-time employment in the center provides support for students, working on advanced degrees in information and computer science.

Early Admission Honors

This program offers admission to the university and regular university courses, at reduced cost, to specially qualified seniors in local high schools. For additional information please call or write: Office of Relations with Schools, Q-035, UC San Diego, La Jolla, California 92093; (714) 452-3140 or 276-2363.

Foreign Student Adviser

See Office of International Education section.

Education Abroad Program

The Education Abroad Program provides students enrolled at the University of California with an opportunity for an intercultural experience at UC centers located in Africa, Asia, Europe, and Latin America while allowing normal progress toward a degree.

The program is described in detail in the "Courses and Curricula" section of this catalog under the "Education Abroad" heading.

Educational Opportunity Program (EOP)

The purpose of the Educational Opportunity Program at UC San Diego is twofold: (1) To provide educational opportunities for those individuals who have been historically underrepresented in higher education, e.g., Native Americans, Mexican-Americans, Black/Afro-Americans, Asian-Americans, and low-income students. (2) Assist promising students from academically disadvantaged backgrounds who show potential of succeeding at the university level.

The EOP program supplements regular university services such as admissions, financial aid, housing, tutoring, personal counseling, and as many other areas necessary to facilitate student success at UC San Diego.

Students who are considering application for undergraduate admissions to UC San Diego, and believe they need special support services should contact the EOP Office in the Student Center.

Educational Opportunity Program
Student Center,
Building B, B-030
University of California,
San Diego
La Jolla, California 92093
(714) 452-4250

University Extension

Extension is the self-supporting system through which UC San Diego endeavors to meet the lifelong educational needs of the San Diego community. It offers a broad range of programs, from business and scientific courses designed to help professionals update their knowledge to arts and humanities classes that enrich one's cultural perspective. Self-discovery workshops, lecture and film series, current events seminars, exercise and sports classes, and study tours all over the world are part of the curriculum. Both credit and noncredit courses are offered on campus and in other San Diego County locations. This year's enrollment is approximately 40,000.

To fulfill its goal of extending the resources of the university to the community, the following programs are also part of the extension curriculum: Concurrent Registration; Tutorial Degree Program; Learner-Centered Education; Institute for Continued Learning; National Media Courses; Summer Study Skills Institute; Alcohol Studies Program; International Studies: Languages, English Language Program, Study Tours; Professional Certificate Courses; and Credentials for Public School Teachers. For further information on extension courses, call 452-3400 for a free *Explore* catalog. Extension is entirely supported by course fees and receives no state funds.

Concurrent Registration

Concurrent Registration is a procedure which allows extension students to enroll in regular UC San Diego courses on a space-available basis with the approval of the course instructor. This program is also open to high school students under special conditions. A reciprocal arrangement with UC San Diego allows an equal number of UC San Diego students to enroll in extension courses free of charge. Undergraduates at UC San Diego

should call their provost's office for information; graduate students should contact the Office of Graduate Studies and Research.

Tutorial Degree Program

This program is a self-directed course of studies leading to a B.A. degree from the Union for Experimenting Colleges and Universities. Participants set their own educational goals, design their own curriculum, and work at their own pace under the supervision of UC San Diego faculty.

Learner-Centered Education

Learner-Centered Education gives participants an opportunity to study in a one-on-one relationship with an expert in his or her area of interest. The learning experience is specifically tailored for the individual.

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.

National Media Courses

National Media Courses is a series of innovative new programs developed by UC San Diego Extension for colleges and universities across the country. The courses utilize outstanding newspaper articles (which comprise the popular *Courses by Newspaper*) and television series (for example, *Connections*) as major course components.

Summer Study Skills Institute

This institute is designed to help college-bound students gain a competitive edge, and is open to those of high school age and older. Additional study skills classes are offered throughout the year.

Alcohol Studies Program

The Alcohol Studies Program includes a summer conference which draws mental health and law enforcement professionals from all over the West for seminars on intoxicant abuse, and a series of courses for driving-while-intoxicated offenders assigned by the court.

Professional Certificate Courses

Professional Certified Courses are planned sequences of related courses, offered in cooperation with professional associations. Accounting, systems management, real estate, and taxation are some of the fields represented.

Credentials for Public School Teachers

Credentials for teachers can be earned through Extension. A wide range of credit courses for educators is also offered each quarter.

Natural Land and Water Reserves System (NLWRS)

The Natural Land and Water Reserves System 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 or other similar 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. Ted Case, chairman of the UC San Diego NLWRS advisory committee. The San Diego campus administers the following five reserves:

Dawson Los Monos Canyon Reserve

This 133-acre reserve is located on the outskirts of the town of Vista in north coastal San Diego County. Its young streamcut valley contains a year-round creek with precipitous

north and south facing slopes. The major habitat types are Southern California Riparian Woodland, Coastal Sage Scrub, and South Coastal Mixed Chaparral. There are also some archaeological values here.

Elliott Chaparral Reserve

Located a short distance off campus, this 107-acre reserve features Chamise Chaparral and related Chaparral species typical of coastal San Diego County. 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 birds, the light-footed flapper rail and the Belding's Savannah Sparrow. There are limited laboratory facilities available on the site. It is within short driving distance of campus.

Ryan Oak Glen Reserve

This fifteen-acre reserve is located on the outskirts of the city of Escondido. Numerous seeps and springs in an otherwise dry region of Coastal Sage Scrub and Chamise Chaparral support an unusually rich flora and fauna for this region. There is a small grove of Englemann Oak. There are no facilities on this reserve but it is easily available during one-day field trips.

Scripps Shoreline-Underwater Reserve

This reserve is located along the shoreline north of the Scripps Pier and features Protected Sandy Beach, Protected Rocky Shore, and Southern Coastal Bluff Scrub. Scientific use of the sixty-seven acres off-shore 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.

STUDENT AFFAIRS

Vice Chancellor, Student Affairs Office (Extension 4370)

This office provides direction and support to all student affairs services and programs. The office is located in the Student Center.

College Deans' Offices (Revelle, Extension 3492; Muir, Extension 3587; Third, Extension 4391; Warren, Extension 4353)

The staffs of the college deans' offices perform many different functions and provide help, advice, counseling, and referral in many areas. They regularly coordinate with other offices such issues as: career planning topics, procedures for applying to graduate school or professional schools, decisions about remaining in or withdrawing from school, legal problems, grade problems, involvement in student governments and other activities, handling financial concerns, housing concerns, assisting with specialized concerns for physically limited students, and assisting in hearing procedures regarding grievances of any kind.

Contact your college dean's office for assistance, particularly if you are uncertain of what office or resource would best be able to aid you with your problem or concern.

Office of University Events (452-4090)

The Office of University Events provides a central source for all programming in the areas of fine arts, films, lectures, and popular entertainment on the UC San Diego campus.

Through a system of campus-wide committees, students and interested faculty and staff recommend the programs which are to be presented during the year.

For student organizations and other campus-related units, the office provides a central source for programming advice and assistance in the areas of event planning, publicity, ticket handling, technical set-up, contracts, etc.

The Office of University Events maintains the Master Calendar of Public Events which acts as a clearing house for all public events presented at UC San Diego. During the 1978-79 school year more than 1,000 events took place.

Counseling and Psychological Services (Information: 452-3755)

The functions of Counseling and Psychological Services are:

1. To provide professional assistance to students having difficulty coping with academic, vocational, personal, emotional, or marital problems.
2. To provide professional consultation to the university community in matters of student behavior in order to prevent problems and enhance the student experience.
3. To consult with professionals and non-professionals working with students on this campus, e.g., deans, administrators, members of the faculty, etc.
4. To promote and conduct basic and applied research, both independently and in cooperation with other offices and departments concerning various aspects of student development.
5. To participate, upon request, in the general education functions of the University and to conduct special programs related to student development.

6. To provide internship experiences for graduate students in mental-health disciplines.

Counseling is available to any regularly enrolled graduate or undergraduate student, and spouse, on an individual or group basis. The services offered include:

1. *Personal Counseling* encourages students who have problems that may be limiting their effectiveness to seek counseling. The most usual problems include depression, loneliness, unsatisfying personal relationships, concerns about issues of sexuality, drugs, alcohol, or academic achievement.
2. *Vocational Counseling* encourages students who are uncertain of their major or of their career goals to explore their interests and skills, and the options available to them.
3. *Workshops* and a variety of groups about specific issues are offered throughout the year. Ordinarily, focal topics will include, for example, motivation, stress reduction, assertion training, human growth, creativity, women's issues, etc.

Members of Counseling and Psychological Services are clinical and counseling psychologists and social workers. Most major cultural and ethnic groups are represented on this staff. Psychologists have offices at all colleges, as well as in a central location. The counseling relationship is private and confidential.

CAREER PLANNING AND PLACEMENT

Career Planning and Placement offers a continuously updated group of services to undergraduate and graduate students. These services include general career advising, workshops, job hunting techniques, and information

concerning employment and graduate/professional school programs.

General Career Advising (Information: 452-3750)

All students are offered advising, learning experiences, and information on:

1. *Career Planning* is a program which provides advising based on the academic field and/or interest of students:
 - a. Humanities & Social Sciences Programs
 - b. Physical & Engineering Sciences Programs
 - c. Health & Biological Sciences Programs

These programs include individual and group advising, field trips, and access to career consultants which provide students the opportunity to explore a full range of career opportunities.

2. *Specific Occupational Exploration* is stressed so that students acquire knowledge of career areas of choice, plan their education accordingly, and seek entrance in a career field most compatible with their needs.

Graduate/Professional School Program (Information: 452-3750)

Placement offers central services for students making graduate and professional school programs their next educational step.

1. *Professional School Advising Service* assists students who have narrowed their career focus to include admission to a professional school, i.e., medical/dental school, law school, graduate management programs. Note: juniors should check how/when/where of medical/dental school application during the late fall quarter.
2. *Advising Services* provides basic "what do you need to know about applying to graduate schools" advising, and

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assistance with comparing and contrasting types of programs. Gives in-depth advising to students on professional programs not directly related to undergraduate majors offered at UC San Diego, e.g., management, social work, law, etc.

3. *Letters of Recommendation Service* provides students who are or will be receiving degrees from UC San Diego the opportunity to establish a file for application to graduate or professional school. The file includes letters of recommendation, copies of which will be sent at the student's request.
4. *Graduate/Professional School Visits* Career Planning sponsors visits by representatives from several educational programs. Students will find these people an excellent source of general and particular information.

Career and Graduate School Library

Students and alumni are provided self-help access to a large spectrum of career literature on occupations, employers, medical/dental schools, and other graduate and professional programs. Also available is an audio cassette library on occupations and career planning techniques. (Information: 452-3750)

Employment

Career Planning and Placement provides job-listing, referral, interviewing, and advising services to students seeking employment. Services offered are:

1. *Job Planning* helps students relate skills to occupational fields of choice, identify and approach potential employers, and learn job-hunting techniques through individual and group advising. Note: this service is recommended for students at all academic levels seeking



part-time, summer, or career employment. (Information: 452-3750)

2. *Part-Time Employment* provides listings of off-campus, part-time, and summer employment opportunities available to currently enrolled students. (Information: 452-4500) Other sources provided are:
 - a. Internships — an opportunity for work experience in a field related to students' academic major or career interest fields; internships are available during the academic year as well as for the summer months.
 - b. Skills File — a computerized listing of students with specialized skills which provides job referrals to

employers requesting those skills. A good opportunity for part-time employment of short- or long-term duration.

- c. Listings of live-in positions, which offer room and board (and sometimes a small salary) in exchange for work.

NOTE: employment *CANNOT* be arranged by correspondence; persistence in checking jobs posted is the best guarantee for finding employment. Foreign students should obtain any necessary work permits from the Office of International Education; students under the age of eighteen must obtain a work permit from their local high school or the State Labor Department Office.

3. *Full-Time Employment* provides

career-related employment lists which are received and posted from local, statewide, and national employers. (Information: 452-3750)

4. *On-Campus Interviewing Service* affords students the opportunity to interview for particular jobs in business, industry, and government. (Information: 452-3750)
5. *Teacher Placement Service* provides advising, placement files, and educational job listings to those degree candidates and alumni seeking teaching positions, particularly at two- and four-year colleges. (Information: 452-3750)

Part-Time Employment, On-Campus

The Student Employment Office, located in 204 Administrative Complex, is the personnel office responsible for students working under staff or a combination of staff and academic titles. This office provides listings of on-campus, part-time, and summer employment opportunities available to currently registered students taking at least six units, those students in a grace quarter, and those students having filed and paid their Statement of Intent to Register. These listings are in many fields including library work, food services, recreation, the sciences, and office work. The listings are available to non-financial aid recipients as well as those students receiving financial aid. Employment CANNOT be arranged in advance or through correspondence since the majority of the jobs are available at the time they are listed and must be filled immediately. Persistence in checking jobs posted is the best method of finding employment. Foreign students should obtain any necessary work permits from the Office of International Education and students under the age of eighteen must obtain a work permit from their local high school or the State Department of Labor Office.

Students are limited to a maximum of nineteen hours per week during academic session and forty hours per week during academic recesses. Students with financial difficulties are urged to confer with the Student Financial Services Office for their college. Job listings for the College Work-Study and University Work-Study Programs are also listed with the Student Employment Office. These programs, in addition to providing financial assistance, allow you to acquire work experience on campus in jobs related to your academic interests. You must demonstrate financial need to be eligible for either work-study program. The College Work-Study Program also allows you to work with public nonprofit employers off campus.

Financial Assistance

All financial assistance for undergraduate and medical students and need-based aid for graduate students is administered by the Student Financial Services Office and is described in this section. 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 that students and their families will bear as much of the necessary cost of the student's education as their circumstances will permit. In those cases where resources are insufficient to meet a normal budget, the Student Financial Services Office will attempt to help students find supplemental financial aid. Applications and requests for information should be addressed to the Office of Student Financial Services, Q-013, University of California, San Diego, La Jolla, California 92093.

No student should leave the university for financial reasons before exploring all possible avenues of aid with a financial-aid

counselor. Financial assistance, loans, grants and work-study, unless otherwise designated, are processed by the Student Financial Services Office. A Student Aid Application for California, tax return, and/or other appropriate documents substantiating need will be required of all students seeking financial assistance. Applications for all forms of financial aid should be submitted to the Student Financial Services Office on time.

Student Aid Application for California (SAAC)

To permit an evaluation of need, parents of all entering and continuing dependent students who apply for need-based aid are required to provide financial information on the Student Aid Application for California. This form should be filed by February 11 with the College Scholarship Service, P.O. Box 70, Berkeley, California 94701, and must indicate that a report is to be sent to the University of California, San Diego.

Independent/Dependent Status

If you are a dependent student we use your parents' information and your resources to determine your eligibility for aid. If you are independent we use only your financial information to determine your eligibility for aid. Because federal and state programs have different rules for deciding whether a student is dependent or independent, you must answer the following three questions in order to determine your independent/dependent status. You will be required to answer "yes" or "no" for each year:

1. Have you lived with your parents for six weeks or more (forty-two days) in 1977, 1978, 1979, or will you in 1980?
2. Did your parents claim you as a dependent on their tax forms in 1977, 1978, 1979, or will they in 1980?
3. Did your parents give you more

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than \$750 worth of support for 1977, 1978, 1979, or will they in 1980?

After you answer the above three questions, check the categories listed below to determine your independent/dependent status.

- A. If you answer "yes" to any question for 1979 or 1980: You are considered a dependent student for both federal and state funds. Your award will be based on your parents' and your ability to contribute to your education. Your Basic Grant eligibility will also be based on your parents' income.
- B. If you answer "no" to all questions regarding 1979 and 1980 and "yes" to one or more of the questions regarding 1977-1978:
1. You will be "independent" for Basic Grant considerations and all federal funds administered by UC San Diego.
 2. You will be "dependent" for need-based grant programs at UC San Diego. If parental income information is not provided you will not be eligible for UC San Diego grant funds.
- C. If you answer "no" to all questions for all years and are under thirty as of October 1, 1980: You are "independent" for both federal and state funds, but must provide parental signatures on the SAAC to certify that the information regarding your independence is accurate. You may be required to provide copies of your parents' 1977, 1978, and 1979 1040 tax returns to verify your independence. If, however, you do provide parental income/asset information in addition to their signatures, you may increase your "gift aid" eligibility and the amount of your grant.
- D. If you answer "no" to all questions for all years and are

thirty or older as of October 1, 1980: You are "independent" for both federal and state funds and do not need parental signatures or income/asset information. However, by providing parental information you may increase your "gift aid" eligibility and the amount of your UC San Diego grant.

- E. In certain unique situations you may not be required to submit parental information or parental signatures and yet will be eligible for federal, state, and UC San Diego funding:
1. If you are an orphan and will not be claimed as an exemption for tax purposes during 1980 by anyone other than self or spouse.
 2. If you have been a ward of the court and can submit appropriate court documents.
 3. If you have been part of an extremely adverse home situation which has led to your estrangement from your family (which can be documented through a statement by a school or responsible community person, such as a minister or social worker) and have not received a contribution in cash or kind from your family for the preceding twelve months.

Scholarships

The purpose of the Undergraduate Scholarship Program at UC San Diego is to encourage academic excellence and to honor outstanding achievement. Scholarships are awarded to entering and continuing students on a competitive basis. Consideration is given to academic ability, scholastic promise, and, in most instances, financial need. The majority of the scholarships are available only to students who can demonstrate financial need. Honorary scholarships (those

awarded solely on the basis of academic excellence) are Regents' Scholarships and Alumni awards, and normally carry only a minimal stipend (\$100-\$300).

Most scholarships are not automatically renewable, but must be reapplied for each year. Scholarship applications are available late fall quarter or early winter quarter for the succeeding academic year; the usual deadline for submission of the application materials is during early February. Recipients are selected by the Committee on Undergraduate Scholarships, which is composed of UC San Diego faculty members.

Notification of non need-based awards (honorary scholarships) begins in mid-April; notification of need-based awards is made with the "Offer of Financial Aid," during the summer immediately preceding the academic year for which the award is made.

Regents' and University Scholarships

The highest honor that may be conferred upon an undergraduate student is the awarding of a Regents' or University Scholarship. Regents' Scholarships are granted by the president of the University of California and the chancellor of the San Diego campus, with consideration being given to academic excellence and promise. Regents' Scholars receive an initial honorarium of \$100, and an annual stipend to cover the difference between student resources and the yearly standard cost of education. The term of appointment is four years for students entering from high school and two years for all others.

University Scholarships, granted by the president of the University of California, are awarded to students of exceptional academic achievement who demonstrate financial need. A University Scholar can receive up to a \$1,200 stipend. The appointment is for one year

only, but a student may reapply each year.

All scholarship applicants are reviewed for these two major awards. An applicant who wishes to be considered for an honorarium only is not required to submit a Student Aid Application for California.

President's Undergraduate Fellowship Program

This program is designed to assist unusually talented undergraduate students to carry out special studies and projects under faculty supervision. The prospective fellow and his or her faculty sponsor must submit a project proposal, including a tentative budget, by May 15 preceding the academic year for which the award is to be made. The chancellor, acting with the advice of the Committee on Undergraduate Scholarships and Honors, will select the fellows by June 1 each year. Stipends will be based on need, to be determined by the cost of the project and the student's own resources.

The Alumni Awards Program

The Alumni & Friends, UC San Diego have begun an awards program to honor undergraduate students demonstrating high academic achievement. The awards are granted to individuals selected from applicants by the Committee on Undergraduate Scholarships and Honors and after interviews with the Scholarship Committee of the Alumni & Friends. Students who wish to be considered for an Alumni Award may file an application with the Student Financial Services Office.

Grants

Basic Educational Opportunity Grants

The Basic Educational Opportunity Grant Program is a federal aid program designed to provide financial assistance to those who need it to attend

post-high-school educational institutions. Basic Grants are intended to be the "floor" of a financial aid package and may be combined with other forms of aid in order to meet the full costs of education. The amount of your Basic Grant is determined on the basis of your own and your family's financial resources.

You will be eligible for a grant if you meet several important criteria:

1. You have established your financial need by submitting a copy of the Student Aid Application for California to the Basic Grant processing center.
2. You will be enrolled at least half-time in an undergraduate course of study and have not previously received a bachelor's degree from any institution.
3. You are a U.S. citizen or are in the United States for other than a temporary purpose and intend to become a permanent resident or are a permanent resident of the Trust Territories of Pacific Island.

The Basic Educational Opportunity Grant Award is a grant and, unlike a loan, does not have to be repaid.

Educational Fee Grants

These grants are awarded only to undergraduates in their first year of attendance at the University of California. Students must be enrolled at least half-time and must be California residents and have financial need. Eligible students will receive grants up to a maximum of \$100 per quarter for the first three quarters of attendance.

University of California Grant Program

The University of California Grant-In-Aid Program provides nonrepayable grants-in-aid to students who demonstrate financial need, without reference to grade-point average.

Supplemental Educational Opportunity Grant

SEOG awards are federally funded and are granted only to undergraduate students demonstrating exceptional financial need. Undergraduates who are United States citizens or permanent residents and are enrolled at least half-time may receive from \$200 to \$1,500 per academic year. The SEOG award may not be more than one-half of the financial assistance which you receive during an academic year. The SEOG award must be matched with other forms of aid such as loans, work study, scholarships or other grants.

Affirmative Action Grants

Affirmative Action Grants are funded by the State of California for undergraduate students who have been admitted to UC San Diego under the Student Affirmative Action Program.

Cal Grant A (California State Scholarships) and Fellowships (Special Application Required)

All financial aid applicants are required to apply for a Cal Grant A. These grants are awarded by the State of California to entering and continuing undergraduate students who are California residents. Awards range from \$300 to \$700 to be applied toward registration and educational fees. Undergraduates may obtain applications for this program from their current school or the California Student Aid Commission, 1410 5th Street, Sacramento, California 95814. The 1980-81 deadline is February 11, 1981.

Fellowships are awarded to first and second-year graduate students, and awards usually cover total fees required for registration. Graduate students may obtain applications for this program from the UC San Diego Office of Graduate Studies and Research, their major department, or the California Student Aid Commission. GRE scores are required.

Applicants for grants and fellowships must be United States

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citizens and California residents. Awards are based on academic achievement and financial need and usually may be renewed for succeeding years.

Cal Grant B (College Opportunity Grant) (Special Application Required)

Cal Grant B is awarded by the State of California to entering undergraduates who are United States citizens and California residents, and who demonstrate financial need. Cal Grant B awards are renewable and range from \$300 to \$1,800 per academic year. The award may also include payment of all or part of the UC San Diego registration fees. Individuals wishing further information or applications may contact a high school counselor or write directly to the California Student Aid Commission, Cal Grant B Section, 1410 5th Street, Sacramento, California 95814. The 1980-81 deadline is February 11, 1981.

Financial Assistance: Undergraduate and Graduate

College Work/Study Program

This federally financed program provides funds for student employment by the university or by public and private nonprofit organizations. Students who are enrolled at least half-time and who are U.S. citizens or permanent residents with demonstrated financial need will be considered. Students who receive work-study awards will receive instructions and job referrals. The Work-Study Program provides experience in many fields, including city planning, mental health, community service in economically depressed areas, recreation, library work, experimental sciences (chemistry, physics, biology, oceanography and related fields), hospital and business administration, and office work. Pay ranges from \$3.41 per hour.

University Work/Study

The program is administered in the same manner as the federal program, except that funding is provided by the Regents of the University of California, and the student is limited to on-campus jobs.

LOANS

Loans are not intended to provide full support, but should be used to supplement other resources. Students with financial need are encouraged to request loan assistance as supplementary aid. Information about all available loans may be obtained from the Office of Student Financial Services.

Educational Fee Loan

Continuing University of California students who are residents of the State of California, are enrolled at least half-time, and demonstrate financial need may qualify for a deferral of the educational fee. Educational Fee Loans, depending upon need, can range from \$100 to \$300 per year for undergraduates and \$120 to \$360 per year for graduates. Each continuing student who receives financial aid from the university's Financial Services Office will be offered this Educational Fee Loan as part of their award if they are currently not receiving another source of aid stipulating payment of fees.

Repayment of the Educational Fee Loan shall begin nine months subsequent to the completion of a student's higher education, including graduate study. Students who terminate their higher education will be required to begin payment of the loan nine months subsequent to termination. The repayment period may not exceed ten years, and the note will bear interest at the rate of 3 percent per annum on the unpaid balance beginning nine months after the student leaves school. Minimum quarterly repayment is at least 2.5 percent of the total fees deferred or \$30, whichever is greater plus

interest. Interest shall not accrue, and payments need not be made in whole or part for a maximum of four years while a student is serving on active duty in the Armed Forces or Action Corps.

University Loan Funds

These funds are provided by the regents of the university to graduate and undergraduate students who are enrolled at least half-time. The amount of this loan is determined by financial need. Eligible students may receive up to \$2,000 per academic year. Students, regardless of age, are required to obtain cosigners. University loans normally are repayable in twenty equal quarterly payments or \$30 plus interest per quarter, whichever is greater, beginning upon graduation or withdrawal from the University of California (whichever occurs first) but not later than nine months from that date. Interest at the rate of 3 percent per annum accrues from the beginning of the repayment period.

National Direct Student Loans

A student is eligible for a National Direct Student Loan if he or she is a United States citizen or holds an immigrant visa and is carrying at least one-half the normal full-time academic workload. An undergraduate student may borrow up to \$2,500 during the first two academic years. The aggregate sum for all undergraduate studies may not exceed \$5,000. A graduate or professional student may apply for up to a \$10,000 maximum for his or her total academic career. Loans are granted for educationally related expenses and are intended to supplement a student's resources in order to meet standard costs of attending the university. Students under eighteen years of age are required to obtain a cosigner. These loans are interest-free until nine months after graduation or withdrawal from student status. Repayments begin at that time. Minimum repayment is

\$30 per month, including interest at 3 percent per annum and may extend up to a ten-year period. Cancellation prior to July 1, 1972 will apply to those loans. Loans made subsequent to June 30, 1973 include cancellation provisions up to 100 percent of the total debt only for those who serve as full-time teachers of disadvantaged or handicapped students in nonprofit elementary or secondary schools, as defined by federal guidelines. Staff members in preschool programs (Headstart) may also qualify for this cancellation benefit, depending upon their salary scale. Members of the armed forces may qualify for up to 50 percent cancellation at the rate of 12.5 percent per annum for service in an area of hostilities.

Short-Term Loans

These funds, made possible by gifts to the university, are granted in small amounts to help students in short-term emergencies, and usually must be repaid within thirty days. Applications are available in the Student Financial Services Office.

California Guaranteed Student Loan and Federally Insured Student Loan Programs (Special Applications Required)

These loans are available to full-time students who are citizens or nationals of the United States, or persons who are in the United States for other than a temporary purpose and intend to become permanent residents thereof. Undergraduate students may borrow up to \$2,500 per academic year, subject to bank policy, with a total maximum of \$7,500 for all years of school. Graduate students may borrow an aggregate sum of up to \$15,000. The state or federal government guarantees the loan to the lender in case of death or default of the borrower and, if the student is eligible, will pay the full rate of interest on the loan up until nine months after he or she is no longer enrolled as a full-time

student. Interest on these loans is 7 percent per year.

Repayment starts between nine and twelve months after the borrower leaves school with a minimum monthly payment of \$30 with up to a maximum of ten years of repayment. During repayment, the borrower will pay the interest. Repayment may generally be deferred if the student is continuing his or her education in another accredited institution or is serving in the Armed Forces, or the Action Corps. During such periods of deferment, the state or federal government will continue to pay the interest if the interest subsidy was approved at the inception of the loan. This loan may be obtained from a participating bank, savings and loan, or credit union. Students who may require this assistance should bank where such a loan is available.

California Guaranteed Student Loan and Federally Insured Student Loan applications will be available in the Office of Student Financial Services, approximately July 1, for the following academic year.

Financial Assistance, Graduate

See section entitled "Graduate Studies".

Student Health Service 452-3300

Entering students are required to complete a Medical History Form prior to registration and to send it to the Student Health Center. 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.

A comprehensive health-care program for students is included among the benefits provided by the university registration fee. A

well-qualified medical staff is in attendance at the Student Health Center on campus and students are encouraged to come and discuss any health problem. Professional and confidential attention is assured. Appointments may be made in person or by telephone. Outpatient service is available from 8 a.m. to 11:30 a.m. and 1:00 p.m. to 4:30 p.m., Monday through Friday. Infirmary care is provided at the Student Health Center for illness not requiring hospitalization. Low-cost dental and optometric care are also available.

Undergraduate, graduate, medical, and nurse practitioner students are eligible for medical care at the Student Health Center, which is provided without charge. Under certain conditions, outpatient services that are considered necessary by Student Health Service staff attending physicians or their designees for the immediate care of registered students, but that cannot be obtained at the Student Health Center, can be provided without charge. Approval for payment for each outside service must be obtained by the student in advance, as explained in detail in the free pamphlet, *Your Health Care at UCSD 1979-81*, copies of which are available at the Student Health Center.

The expenses of any professional care of students while away from the San Diego area, or of any care involving hospitalization, cannot be met by the campus. Students are therefore strongly urged to provide themselves with adequate health insurance to meet such needs. An inexpensive limited insurance plan which provides students with benefits for hospitalization and outpatient care not available through the Student Health Service has been negotiated by the Student Health Service Advisory Committee. This plan is available for purchase from an insurance company representative at the Student Health Center each quarter during announced open enrollment

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periods only. A brochure describing benefits and limitations of the plan may be obtained at the center.

Registered students may purchase a similar policy for their married spouses and/or dependent children, renewable each quarter. Insurance may only be purchased for a limited time during open enrollment periods at the beginning of each quarter.

Medical History Forms and Physical Examination Forms are sent to students. Further information on insurance may be obtained at the Student Health Center after arrival on campus.

Office of International Education

The Office of International Education has both foreign and domestic functions. It is responsible for the proper documentation of all nonimmigrants on the campus, whether they be foreign students, postdoctoral fellows, or faculty. In addition, the Office of International Education assists with hospitality programs, counseling, and other needs of the foreign community. All new students, researchers, and faculty who are citizens of a country other than the United States are asked to visit the Office of International Education, International Center, Administrative Complex, as soon after their arrival on campus as possible and to bring their passports with them so that their visa status may be verified.

Departments are required to advise the Office of International Education of both the arrival and departure of visiting foreign faculty members.

Office of Religious Affairs

The Office of Religious Affairs is a cooperative venture of the religious community to provide religious counseling, marriage preparation, coordinate the activities of various religious student groups, arrange speakers and programs of interest to the general campus, and serve

as a theological resource for the educational enterprise. For further information: 507 Warren Campus, Extension 2521.

Disabled Student Services 452-4382

The primary objective of Disabled Student Services (DSS) is to integrate the disabled student into general campus programs and activities. The ability of the disabled student to function independently in the educational environment is the ultimate goal. With the installation of electric doors in the more heavily used buildings plus ramps, curbcuts, and elevators, UC San Diego is considered to be physically accessible. All buildings have at least one accessible bathroom. The terrain of the main campus is relatively flat, however some inconvenience may be experienced when going to lower campus locations. Blind students needing orientation to the campus should contact DSS. Residence halls have accessible bathrooms, roll-in showers, and local cafeterias. The Housing Office and Resident Assistants are receptive to meeting the needs of the disabled. The following services are available to meet the individual needs of disabled students: counseling and advising, special equipment, and academic support personnel coordination. Also available are lists of readers, interpreters, notetakers, mobility assistants and attendants, special parking, registration assistance/special enrollment procedures, special test-taking arrangements, liaison with outside agencies such as California State Department of Rehabilitation, and referrals to appropriate resources, services, and agencies.

If you are a disabled student, please contact DSS as soon as you receive notification of your admission to UC San Diego. MEDICAL DOCUMENTATION OF DISABILITY WILL BE REQUIRED FOR THE DELIVERY OF MOST DISABLED STUDENT SERVICES.

Veterans Affairs

The Office of Veterans Affairs, located in Building 204, Administrative Complex, provides information regarding veterans' educational benefits. If you have any questions before you arrive on campus, contact your nearest Veterans Administration Office. Be sure to check in with the Office of Veterans Affairs on campus as soon as you are admitted to assure prompt and proper payment of your benefits. Students who are already receiving benefits under the G.I. Bill or dependents' programs should be certified each year for benefits and are required to notify the Office of Veterans Affairs on campus of any changes in program, units, degree objective, or address.

The Office of the Registrar monitors the enrollment, withdrawal, and status activities for all veterans or other eligible students receiving benefits and certifies this information by official document for the Veterans Coordinator, Student Financial Services, UC San Diego, who reports any changes in student status or eligibility directly to the Veterans Administration.

All undergraduate students must maintain a grade-point average of 2.0 (C) or better. The minimum requirements for an undergraduate degree are 184 quarter units at Revelle College and 180 quarter units at Muir, Third, and Warren Colleges. Students must complete degree requirements before they accumulate 192 quarter units except under special circumstances and approval.

If students drop below a 2.0 at the end of any quarter, they are subject to academic probation. If they remain on probation two consecutive quarters, or if they drop below 1.5 in any one quarter, they are subject to academic disqualification (dismissal).

All graduate students at UC San Diego must maintain a grade-point average of 3.0 (B) or better. If students drop below a 3.0 at the

end of any quarter, they are subject to probation. Students are subject to academic disqualification (dismissal) if the grade-point average drops below 3.0 for two consecutive quarters.

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.

The Office of Veterans Affairs staff can answer questions about check problems or other programs administered by the Veterans Administration or can phone an inquiry to the Veterans Administration Regional Office and have an answer for you, usually in two days.

Veterans who need tutorial assistance or who are interested in VA work-study should contact the Office of Veterans Affairs, 204 Administrative Complex.

Selective Service

Any questions about lotteries, classifications, physical examinations, or conscientious objection should be directed to the local selective service office in San Diego.

On-Campus Housing (Mail Code Q-041)

Revelle, John Muir, and Earl Warren Colleges each has 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 cost for room and board is approximately \$2,270 plus a \$45 deposit for the 1980-81 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. UC San Diego also offers two-bedroom apartments for four single undergraduate students. They are located at Third and Warren Colleges. 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 to all who have indicated their interest in on-campus housing on their applications for admission. Students must return the housing application and file a Statement of Intent to Register Form to be eligible for housing. Contracts are sent based on a priority system and as space permits.

The resident dean or counselor 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, Administrative Complex, administers housing contracts, accepts housing payments, and handles other details related to housing.

Apartments for married students consist of fifty-six one-bedroom units and thirty-one two-bedroom units in the Coast complex, and nine one-bedroom units, 438 two-bedroom units and nine three-bedroom units at Mesa. Students with children have priority for all two-bedroom apartments, although some units are presently allocated for married couples without children and single graduate students. The apartments in both complexes are unfurnished except for stoves, refrigerators, disposals, and living-room drapes. Most Mesa apartments are carpeted. Coin-operated washers and dryers are available in the community buildings on the

apartment grounds. Rental rates for two-bedroom apartments range from \$180 to \$258 per month including utilities and one parking space.

Accommodations for single graduate students are limited to nineteen single apartments at Coast and some two-bedroom units at Mesa which can be shared by two students. There is a waiting list for the apartments.

You may write to, or apply in person at the Residential Apartments Office, Q-041, University of California, San Diego, La Jolla, California 92093, for brochures and applications for Coast or Mesa apartments.

The Off-Campus Housing Office, (714) 452-3670, can also assist in finding suitable accommodations in the surrounding communities of Clairemont, Del Mar, La Jolla, Pacific Beach, and Solana Beach.

Off-Campus Housing

The Off-Campus Housing Office is located in Building B of the Student Center. This office maintains an up-to-date listing service for a variety of rentals. Many students share houses and apartments and find roommates through the assistance of the "share board". The university is located in the midst of a resort area which results in relatively high rents in the coastal towns of Del Mar, Solana Beach, Cardiff, Encinitas, and Leucadia, north of campus, and La Jolla, Pacific Beach, Mission Beach, and Ocean Beach to the south. As one moves east of campus to University City and Clairemont, rent decreases slightly.

Accommodations within three miles of campus are in short supply. Approximate monthly costs for unfurnished rentals, excluding utilities, are:

\$120 - \$200	for furnished room with kitchen privileges
\$130 - \$225	for own room in house with other students

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\$150 - \$275	for studio or bachelor apartment
\$250 - \$350	for one-bedroom apartment or house
\$300 +	for two-bedroom apartment or house
\$450 +	for three-bedroom apartment or house

Furnished rentals are considerably more expensive. Also available through the office are suggested rental related forms, maps of the campus and nearby communities, hotel and motel information, legal advice relating to landlord tenant problems, bus schedules, and a variety of house-hunting aids as well as the use of a free telephone in locating housing.

Since listings change daily, they are not mailed and listings are not given over the telephone. For further information regarding either off-campus housing or transportation, contact the Off-Campus Housing Office, Student Center Building B, B-009, University of California, San Diego, La Jolla, California 92093.

Food Services

A wide variety of foods in various settings is available on campus. Three complete cafeterias are located on the Revelle, Muir, and Warren campuses respectively. Additionally, seven unique snack bar facilities are situated at various locations on campus including: Muir Rathskeller; Revelle Deli, Waffle and Bake Shop; Third College Snack Bar and Munch Box; Warren Snack Bar; Winzer Snack Bar, and Scripps Lunchroom. Hours vary depending on locations.

The pub is located in the Student Center. The University Bookstore, Ice Cream Hustler, and the Notion Store stock a limited selection of foodstuffs, and a large variety of vending machines are located at key traffic locations throughout the campuses.

Intercollegiate Athletics

The UC San Diego Intercollegiate

Athletics Program is one of the most extensive sports programs in the country. With over thirty teams to choose from, students of varying interests and abilities have an open door to healthy athletic experiences. Teams are formed based on demonstrated student interest and include the following: baseball, volleyball, rugby, basketball, water polo, swimming, surfing, crew, tennis, badminton, soccer, golf, track and field, cross country, fencing, cycling, racketball, skiing, and sailing.

The same athletic philosophy governs men's and women's sports. Athletes of both sexes share successfully in the use of facilities, equipment, and financial resources. No athletic scholarships are provided, but the values derived from participating with other athletes, receiving instruction from qualified coaches, travelling to other campuses, and striving for excellence are numerous.

Recreational Facilities, Department of Physical Education, Gymnasium, Extension 4032 or 4037

Two gymnasiums, tennis courts, natatorium, and playing fields are important centers of campus life and may be used by all students at no charge. Students are entitled to lockers, towel issue, and the use of many items of recreational equipment. A nominal fee is charged for sailing, waterskiing, and rowing privileges at the Mission Bay Aquatic Center, as well as for recreational privileges for spouses and children of UC San Diego students.

Intramural Sports

The UC San Diego intramural sports program offers a diversified schedule of quarterly sports activities for all students. Activities range from the traditional football, basketball, and softball to the more innovative innertube water polo and team tennis. Leagues are formed to meet the competitive desires of the

participants and include those for both the highly skilled performer and those for students merely interested in fun and exercise. Major emphasis is placed on a coed sports program (men and women competing on the same team) which enhances social interaction while promoting physical fitness.

Recreational Athletic Clubs

Recreational athletic clubs play a vital role in the students' social life on campus. Many activities are offered quarterly such as ballroom dance, horseback riding, karate, outing, snow skiing, and scuba diving. Clubs meet on a weekly basis for activity sessions and sponsor events such as aikido and karate tournaments, seminars, folk dance workshops and festivals, films, glider meets, and ski trips at minimal cost to students.

Wilderness Activities at UC San Diego

The location of UC San Diego encourages participation by its students, faculty, and staff in hiking, backpacking, cross-country skiing, canoeing, and other outdoor activities associated with wilderness or near-wilderness areas. Various organizations and programs have been developed to take advantage of the opportunities so readily accessible in the surrounding areas of UC San Diego.

The Wilderness and Human Values is a lecture-discussion class which is offered each spring by John Muir College and is open to all UC San Diego students. It considers the role of wilderness in the shaping of America's beliefs, attitudes, and cultural values and confronts problems related to the need to preserve these areas. For further information about the course call the Muir Interdisciplinary Studies Office, 452-3589.

Wilderness Discovery program is an intensive eleven-day outing designed for incoming students of Warren College. The emphasis is on

creating stressful situations that require individual and group reaction. For more information contact the Warren College Residence Halls Office, 452-4343.

The Wilderness House is designed for Muir student residents especially interested in wilderness and outdoor activities, and is located on the fifth and sixth floors of Tioga Hall. Call the Muir College Residence Halls Office for more information about this program, 452-4202.

UC San Diego Outing Club is a student-run organization whose objectives include bringing people together who have mutual outdoor recreation interests and who desire to share companionship with others through trips and discussions. For further information call the Outdoor Recreation Office, 452-4037.

UC San Diego Outdoor Recreation Program, is a service program for all students, faculty, and staff. It offers an equipment rental service, seminar/workshops, leadership training, trips, and an information resource center. Please call the Campus Outdoor Recreation Office, 452-4037.

The Student Center
452-4022
Office hours:
8:00 a.m. - 4:30 p.m.

The Student Center is the central meeting place for members of the UC San Diego community. Step One contains the Student Information Center, meeting rooms, lounges, and a game room. Also available in this facility are offices for student organizations and various administrative units in Student Affairs. Among these units are the Offices of the Vice-Chancellor of Student Affairs, Director of the Student Center, and student organizations adviser.

Step Two contains two buildings for student organizations and student co-ops, and a building for student affairs units which includes Off-Campus Housing, Career

Planning and Placement, Legal Services, University Events Office, and Off-Campus Employment.

The latest addition to the Student Center complex is Walk's Place at the Pub which serves food, beer, and wine.

EDNA Student Information Center,
452-3362

Hours: 8 a.m. - 10 p.m.
Monday - Thursday;
8 a.m. - 11 p.m., Friday;
Noon - 11 p.m., Saturday;
1 p.m. - 6 p.m., Sunday
(Summer and vacation hours:
9 a.m. - 5 p.m., Monday - Friday.)

The Student Information Center is a central information and referral point for students. If the EDNA staff members cannot answer your question, they will refer you to the proper person or agency. Some of their functions are the following:

1. Explaining operations of campus offices and maintaining information on student, staff, and faculty locations.
2. Maintaining information on all campus events from major concerts to departmental seminars, and information on events from major concerts to departmental seminars, and information on events in San Diego County, from other college campus activities to schedules for the Civic Theater.
3. Answering questions regarding academic matters, e.g., classes, registration, academic advisers, and library hours.
4. Referring students with personal problems to the appropriate office or center.
5. Maintaining information on current issues of interest to the UC community, such as general elections, campus referenda, and special projects on campus.
6. Obtaining medical assistance for students at any time of the night or day.
7. Providing ride board,

buy-and-sell service, and recommendations on various services in the area such as restaurants, barbershops, beauty parlors, stores of all kinds, dentists, doctors, legal aid, abortion counseling, drug counseling, draft counseling, auto insurance, bus schedules, plan schedules, etc. They also give suggestions for recreational activities and have information on the San Diego Zoo, Disneyland, Sea World, etc.

Student Organizations,
452-4450.

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

Location: Second floor north,
Student Center

The Office of Student Organizations registers all UC San Diego student organizations each year in the fall. Students who are interested in forming new student organizations should contact this office for registration forms.

The student organizations adviser approves registration forms for all organizations and assists student groups with planning programs. The student organizations adviser works with the ASUCSD Finance Committee, which allocates funds to student organizations, and the adviser approves expenditures of these funds. Student organizations' programs and activities are coordinated with the University Events Office.

MISCELLANEOUS SERVICES AND FACILITIES

The Alumni & Friends,
UC San Diego

Former students, their parents, and friends of the university are invited to membership in The Alumni & Friends, UC San Diego. More than an alumni association in the customary definition, this organization affords its members broad participation in university programs. It sponsors a number of vital activities including

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scholarships, legislative relations, and student programs of interest to both the community and the university.

Members of The Alumni & Friends enjoy many special benefits, including library privileges on all University of California campuses, a subscription to the *Alumni Quarterly*, a discount on the first enrollment in a University Extension course, use of UC vacation centers throughout California, and participation in special-rate tours.

Students and friends are invited to visit the Alumni Affairs Office, Building 103A, Administrative Complex, or call 452-4490 for further information.

Parking & Transit Systems on Campus, Building 400, Warren College, Extension 4223

Parking permits are required on the UC San Diego main campus from 7:00 a.m. to 5:00 p.m. Monday through Friday and at Scripps

Institution of Oceanography from 7:00 a.m. to 5:00 p.m. every day. This requirement is enforced by the Campus Police Department through the issuance of parking citations payable to the City Treasurer's Office.

Parking permits are available at the Central Cashier, Building 401, Warren College. Student rates are the equivalent of \$5.00 per month and must be paid in advance from date of purchase through June 30. Student permits are only valid in yellow striped spaces. A grace period of approximately one week is granted at the beginning of the fall quarter, 1980 (starting September 15, 1980). Students who intend to purchase a parking permit when required may park in student/yellow parking areas without a permit during the grace period only:

If you have any questions about parking or are interested in joining a carpool or forming a vanpool or getting information on San Diego Transit, stop by the Parking &

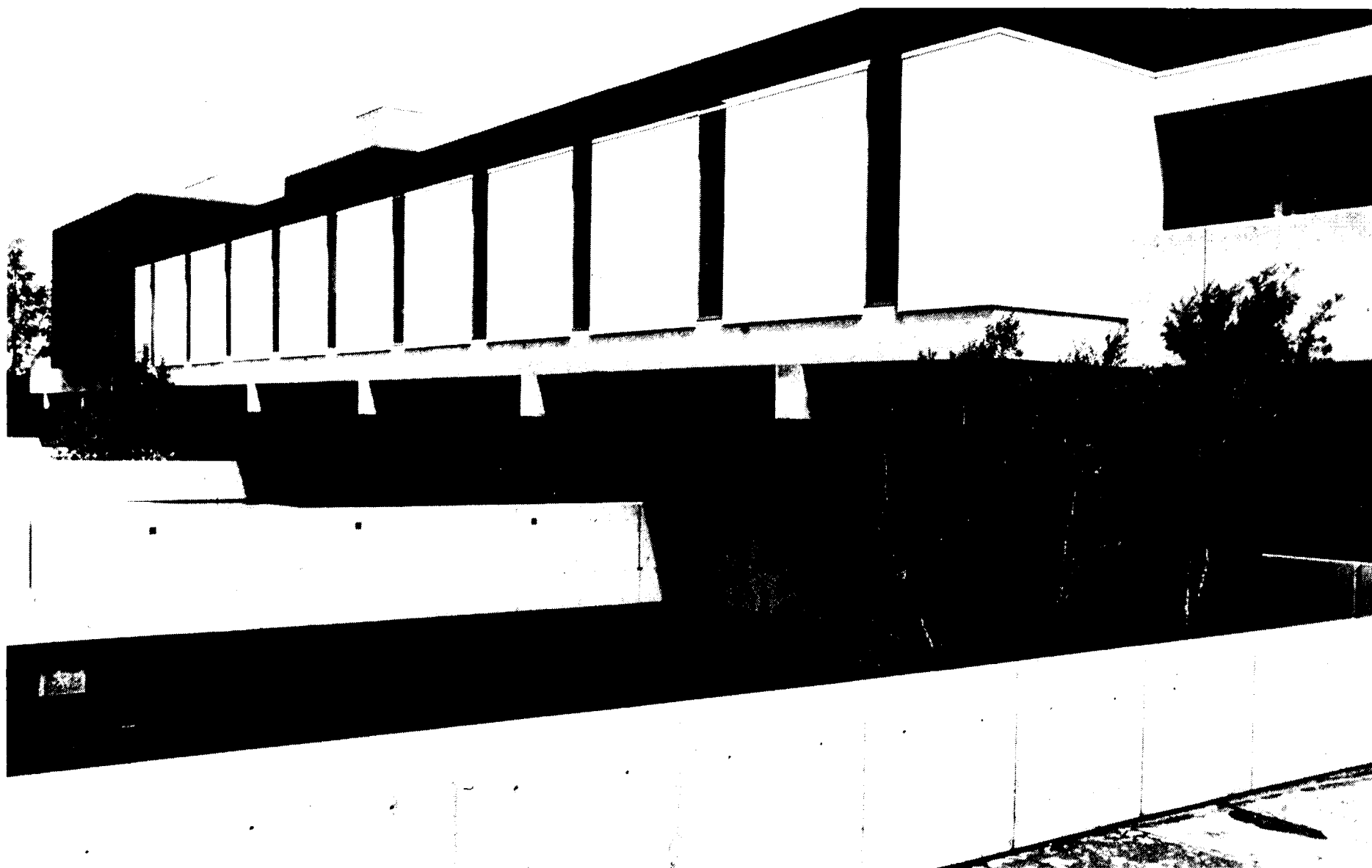
Transit Systems Office or give us a call.

Check Cashing

With proper identification, students may cash personal checks up to \$25 for a small charge at the Central Cashier's Office, Building 401, Warren College, (Hours: Monday through Friday, 9 a.m. - 3 p.m.), the University Bookstore, Building 201, Administrative Complex, (Hours: Monday through Friday, 8:00 a.m. - 4:45 p.m.), and the Central Box Office, Student Center (Hours: Monday through Friday, 10:00 a.m. - 2:00 p.m.).

University Bookstore, Building 201, Administrative Complex Extension 3770

The University Bookstore makes available an extensive selection of books, including textbooks required for UC San Diego courses, supplementary reading materials, paperback books, technical reference books, medical books,



and a wide variety of general-interest trade books. In addition, the bookstore carries a full line of sundries and gifts, including personal items, snacks, magazines and newspapers, clothing, posters, school supplies, electronic calculators, and art and engineering supplies. Hours are 8:00 a.m. to 4:45 p.m. Monday through Friday, with special hours during rush periods at the first two weeks of every quarter.

**Mandeville Art Gallery,
Mandeville Center, Room 101
Extension 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: Autochromes from the Albert Kahn Collection, Tonkin 1915-1916; The Decorative Impulse; Artists in the Courtroom; Raymond Saunders: New Works; and Images of Mexico. Gallery hours are from 12 noon to 5:00 p.m. Sunday through Friday and 7:00 to 9:00 p.m. on Wednesday.

Crafts Center

Located in the middle of the campus, the Crafts Center offers studios and art/crafts instructional facilities in ceramics, jewelry, mime, drawing, woodworking, quilting, enameling, glass arts, and photography.

The center provides personal enrichment and creative educational opportunities to individuals wishing to develop artistic skills in an active studio-classroom situation.

Classes are offered without university credit, enabling students the freedom to explore creative expression in many art media without academic pressures. Registration is at the Crafts Center building, and takes place the first week of each quarter. Specific times, fees and scheduled course offerings can be obtained by coming to the center, or telephoning 452-2021.

Day Care Center

The UC San Diego Day Care Center offers full day care (part-time also available) for UC San Diego students' children from as soon as they walk to age five and one-half. The center is open five days a week from 7:45 a.m. to 5:15 p.m. For information call Extension 2768, Ms. Foulks, or visit the Center, which is located across the street from Graphics and Reproduction Services, Building 510, Warren College.

**Duplicating Services,
Building 510, Warren
College, Extension 3020**

Several kinds of duplicating services are available on the campus. In the Central, Biomedical, Science and Engineering, SIO and Cluster I Libraries, self-service duplicating machines are available at five cents a copy. The bookstore has a self-service duplicating machine which makes copies for ten cents a page.

Students may also use the Graphics and Reproduction Services on a cash basis when the work is directly related to the individual's studies. Requests should be made to Graphics and Reproduction Services, Building 510 Warren College, or to any of the Quick Copy Centers located at 3301 Applied Physics & Mathematics Building, Muir; 1001-B Urey Hall, Revelle; 4050 Basic Science Building, School of Medicine; Central Storehouse/Receiving, SIO; and 302 South Annex, University Hospital, accompanied by a signed statement that the work is directly related to the academic program. Payment may be made by submitting a check payable to the Regents of the University of California or presenting a cashier's receipt from the Central Cashier's Office, Building 401, Warren College, in the amount of the total cost of the work performed.

The copier machine located in Graphics and Reproduction

Services, Building 510 Warren College, is especially good for thesis work requiring excellent copy quality. Copies cost four and a half cents each and students are requested to book in advance for the use of the machine. Payments may be made as stated above.

**University Police
Department, Building 500,
Warren College,
EMERGENCY ON-CAMPUS, DIAL
"HELP" (4357), OFF-CAMPUS DIAL
452-HELP, Telephone for Routine
Business 452-4360**

The University Police Department provides round-the-clock coverage for the campus. Along with police duties, officers have advanced first-aid training and are equipped with one of the finest ambulances in San Diego County.

The University Police Department is service-oriented. Its purpose is to promote and protect the individual rights of students, faculty, and staff alike by reasonable enforcement of university regulations as well as state and federal laws.

**Lost and Found, Building
500, Warren College,
Extension 4361**

Lost and Found is located at the Police Department. Any article found on campus should be taken to the Police Department. The Daily Guardian office, and the Student Information Center also have lost and found offices.

**Post Office, 104 Argo Hall,
Revelle Campus,
Extension 2052**

The Argo Hall Post Office is a contract station operated under the rules and regulations of the U.S. Postal Service, where stamps, money orders, etc., may be purchased, and parcels and letters mailed. It is open from 9:30 a.m. to 4:00 p.m., Monday-Friday.

The post office provides Monday through Saturday distribution of mail to resident students during the academic year.

Research at UC San Diego

Several institutes, centers, and projects at UC San Diego carry out advanced research programs and provide opportunities for graduate-student support in several broad disciplines, often spanning the areas of knowledge encompassed by several academic departments. The senior staff of these units are faculty members in related academic departments. The study programs of graduate students supported by institutes and centers are administered by the academic departments in which the students are enrolled. Institutes and centers presently in operation at UC San Diego are described below.

ORGANIZED RESEARCH UNITS — UNIVERSITY-WIDE INSTITUTES

Institute for Geophysics and Planetary Physics (IGPP) was established in 1960. Present research concentrates on the study of the earth's strain field by measurements of gravity, tilt, displacement, and longitudinal strain; of earthquake mechanisms; of seismicity of the oceans; of the normal modes of the earth; and of tides, waves, turbulence, circulation, and sound in the oceans. 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.

Institute of Marine Resources (IMR) was established in 1954 to provide a center at the University of California concerned with marine resources. The broad objective of the institute is to acquire and disseminate knowledge of the sea's resources, not only the contents and nature of the ocean and its boundaries, but also the social, legal, economic, and political aspects and constraints of its uses. The institute's programs involve research, education, and public service in relation to man's uses of marine resources, including food science, marine products, transportation, recreation, waste disposal, production of energy, and the processes and conflicts that extend or limit these uses. There are many opportunities for graduate students, as the diversity of these subjects indicates.

The institute's Center for Marine Affairs deals with problems at the interface of science and society primarily at the state level yet within a national and international context. The center's purpose is to encourage and facilitate the meaningful contribution of the university to the public

policy-making processes concerned with the wise utilization, conservation, and management of ocean and coastal resources by serving as a focus for independent current advice, assistance, information exchange, public policy-oriented research, and training.

Also within the institute, the Sea Grant College Program offers traineeships to California graduate students in the physical, biological, and social sciences to provide experiences in the performance of marine research while completing thesis requirements through their own campus or department. Further information on this and other IMR programs is available from the Scripps Institution of Oceanography graduate department.

Institute for Research at Particle Accelerators is an intercampus research unit 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.

ORGANIZED RESEARCH UNITS — CAMPUS-WIDE INSTITUTES

Institute for Information Systems (IIS) is a center for collaborative research for departments concerned with all aspects of information theory, computer science and engineering, communications, systems analysis, and related topics. The cooperating units currently include the Departments of Electrical Engineering and Computer Sciences, Mathematics, Neurosciences, and Psychology. The work of IIS is concerned with such topics as human information processing, advanced software for microcomputers, communications and education applications of small computers, the coding of information in the nervous system, and brain models. Projects of the institute provide facilities and support for graduate students and postdoctoral fellows to conduct interdisciplinary research, and for independent study projects of undergraduates.

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 nuclear physics, hydrodynamics, molecular and solid-state physics, theory of liquids, 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.

CENTERS

The Cancer Center has been established to promote patient care and to facilitate the interchange between faculty and students doing basic research and clinical protocol research in the field of oncology. The CORE Grant from the National Cancer Institute has established core services for the study of pharmacology and cytogenetics; athymic mice; biostatistics; endocrine and radioiodination; and tissue collection, culture, and media. A Protocol Administration Service assists in coordinating all clinical studies involving cancer patients at UC San Diego. Research and education grants support the training of postdoctoral fellows, house officers, and medical students. Clinical activities of the Cancer Center are located in the Combined Oncology Clinic.

A four-story building on the University Hospital campus will house the clinical and laboratory activities of the center.

Center for Developmental Biology promotes teaching and research in the field of developmental biology. Various disciplinary groups within the biomedical sciences are associated with the center. The common aim of these groups is to study developmental problems in different types of organisms, with approaches ranging from the molecular to the behavioral. Current research and instructional programs are in the fields of developmental genetics, photobiology, reproductive biology, cytodifferentiation, biochemical embryology, tissue-tissue interactions, and morphogenesis of subcellular components.

The Energy Center initiated graduate research programs and graduate and undergraduate courses on energy-production techniques and energy policy in 1972-73. These interdisciplinary

activities are being coordinated by faculty members including representatives from the Departments of Applied Mechanics and Engineering Sciences, Electrical Engineering and Computer Sciences, Biology, Chemistry, Economics, and Physics. A limited number of graduate research assistantships are available for work on energy-related programs. For further information, write to the chairperson of the academic department in which graduate study is to be performed.

Center for Human Information Processing provides facilities for research and supports research-related activities of psychological and interdisciplinary projects in the areas of perception, psychophysics, 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. As parts of the center, the Program in Cognitive Science and the Laboratory of Comparative Human Cognition conduct workshops, conferences, and postdoctoral programs in their areas of special interest.

Center for Iberian and Latin American Studies (CILAS) coordinates and assists interdisciplinary research and instruction as they relate to the cultures of the Spanish, Catalan, Portuguese, and Judeo-Spanish speaking peoples. The center operates across traditional departmental boundaries to encourage inquiry in four sub-areas: the historical cultures of Iberia, the varied experiences of Latin America, the past and present life of the Chicanos of the Southwest United States, and the problems of interaction of the "Frontera", or borderland region societies of Southern California and Baja California, Mexico.

Research at UC San Diego

The center coordinates joint study projects with other institutions, encourages groups of scholars to coordinate individual research projects, disseminates the results of current research, and sponsors special conferences and symposia in CILAS-related fields. A major aspect of the center is a long-term arrangement between UC San Diego and the University of Madrid, which allows teams of professors, postdoctoral fellows, and graduate students to work at the Catedra-Seminario Menendez Pidal, a research institute of the University of Madrid.

Center for Music Experiment (CME), formed in 1971-72, is dedicated to the exploration of the basic concepts of sound and new trends in music and related areas through interdisciplinary investigation, experimentation, and performance. Initial funding from the Rockefeller Foundation and continuing support from the National Endowment for the Arts, the California Arts Council, and other private and public funding agencies enable the center to continue its activities organized around four major areas:

Computer Audio Research Laboratory under construction is a unique major facility specifically designed for the synthesis, analysis, recording, and processing of multichannel high quality sound. Computing facilities will include a powerful general purpose timesharing computer, a high-speed dedicated minicomputer, and special purpose digital hardware for audio processing built in the digital electronics construction portion of the laboratory. This facility is specifically designed to support both real time and non-real time music production and performance processing, as well as research in the physical, psychophysical, and engineering aspects of digital audio recording and processing.

Studio for Extended Performance concerns itself with the interplay of

the musician with technology, science, and other artistic disciplines. It promotes research in extended instrumental techniques, instrument design and construction, the development of new tuning systems, improvisation, performance electronics, experimental education, and new modes of artistic presentation.

Colloquia draw upon the expertise of UC San Diego 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.

Documentation Unit 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 a newsletter, *Directions*.

The center acts as a generator of basic questions and as a deliberate experimental arts station trying out various ideas and reporting on their character to both the music profession and the general public.

Center for Research in Language Acquisition is an independent unit of the Institute for Information Systems. The focus of the center is on first and second language acquisition and the many disciplines it involves (e.g., linguistics, psychology, sociology, and anthropology). The center's facilities are designed to accommodate laboratory research projects by the faculty and graduate students. Present research interests are concerned with variables that affect foreign language acquisition, the psycholinguistic characterization of the process of acquisition of sign by deaf children, and the designing of language teaching materials, in particular for English as a second language.

Project for a Center for Computer Assisted Textual Analysis has been developed in order to facilitate interdisciplinary research which has textual materials as its subject and which can be aided through the application of information science methods and technology. The project includes faculty members from the Departments of Anthropology, History, Linguistics, Literature, and Sociology at UC San Diego.

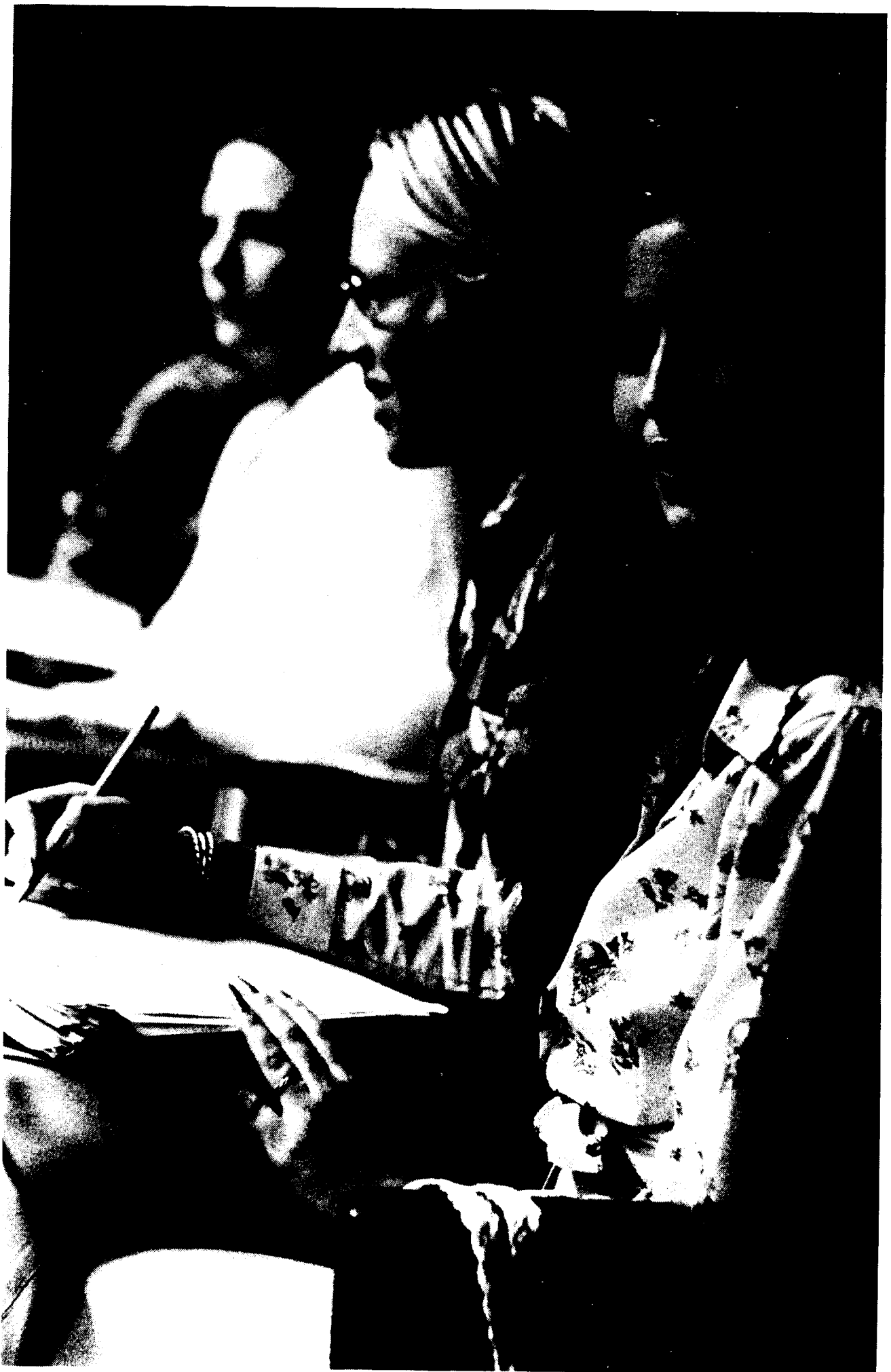
The project is cooperating with similar groups at the Universities of Chicago and Wisconsin (Madison), at Pennsylvania State University, and Brigham Young University. The members of the project seek to make machine-readable textual data files widely available and to develop appropriate analytical software for use with those materials.

Program in United States-Mexican Studies

OFFICE: Building 402 Warren Campus

Wayne A. Cornelius, Ph.D., Director

This program serves as a national and international center for research, training, and public service activities concerning relations between Mexico and the United States. It deals with the full range of problems and issues affecting these relations (including immigration, trade, energy, foreign investment, technology transfer, environmental and cultural concerns, and public health problems). The program conducts original research, offers research and training fellowships for visiting scholars from Mexico and other U.S. institutions, maintains a research library, sponsors public conferences and other public education activities, and publishes reports on current research bearing on U.S.-Mexican relations. The program also offers an annual seminar on U.S.-Mexican relations (Political Science 189), and provides research assistantships



and small research grants to graduate students and advanced undergraduates wishing to conduct independent research in this field.

While based administratively in the Department of Political Science, the program is interdisciplinary in its concerns and approach, and invites the participation of scholars from all

disciplines as well as nonacademic specialists from the public and private sectors in the U.S. and Mexico. The program aims to serve as an integrating mechanism and informational clearinghouse for research undertaken at many different sites and as a vehicle for bringing scholars, citizens, and public officials together to examine

the salient issues in U.S.-Mexican relations.

CAMPUS-WIDE RESEARCH FACILITIES

The Computer Center

See page 132.

The University Library

See page 131.

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. Because the School of Medicine and the UC San Diego general campuses are developing simultaneously, a close interdisciplinary cooperation has developed. Teaching and research, therefore, are well integrated on this campus. Faculty positions for scientists whose interests relate to medicine and human biology are assigned to various departments throughout the general campus, including the Departments of Applied Mechanics and Engineering Sciences, Biology, Chemistry, Mathematics, the Scripps Institution of Oceanography, and Sociology. These faculty members also occupy space in the School of Medicine and teach in the medical curriculum, creating special courses which emphasize those

areas of their disciplines most useful to medical students. Another unique 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 complex beings 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 University of California Medical Center. These affiliated hospitals and clinics include the 380-bed University Hospital and a variety of outpatient clinics; the 646-bed (expandable to 820 beds) Veterans Administration Hospital adjacent to the La Jolla campus; the 1,200-bed Naval Regional Medical Center, which is the largest military medical complex in the United States, and

eight other affiliated medical facilities. Two additional major facilities were completed in 1978: a clinical teaching facility located at the University of California Medical Center, and a medical teaching facility adjacent to the Basic Science Building.

The goal of the medical curriculum, clinical experience, and faculty-student interactions is to develop individual, 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 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 comprise 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 with 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. At faculty option, students with advanced training in a core area may take advanced work in this or another area, begin independent study, or accelerate their progress through medical school. 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 a pass or fail basis and receive individual evaluations by the faculty.

The School of Medicine enrolled its charter class of undergraduate medical students in September, 1968. This class graduated in June, 1972. Freshman student enrollment increased to 128 in 1978, and a total annual enrollment of almost 512 medical students is expected by 1981.

Selection Factors

Selection is based upon the nature and depth of scholarly and extracurricular activities undertaken, academic record, performance on the new MCAT, letters of recommendation, and personal interviews.

The Admissions Committee gives serious consideration only to those applicants with a GPA greater than 3.0, above average scores on the new MCAT, with the exceptions of applicants from unusual or disadvantaged backgrounds. The School of Medicine is actively recruiting students from disadvantaged backgrounds 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
(714) 452-3880

Programs for Prospective Medical Students

UC San Diego 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 Planning Placement Services.



Scripps Institution of Oceanography

Scripps Institution of Oceanography is one of the oldest, largest, and most important centers for research, graduate training, and public service in the marine sciences. This past year the institution marked its seventy-sixth year. In all, Scripps occupies sixty-one buildings on 230 acres. Its staff numbers approximately 1,300, including 190 graduate students. The institution's budget exceeds \$50 million annually.

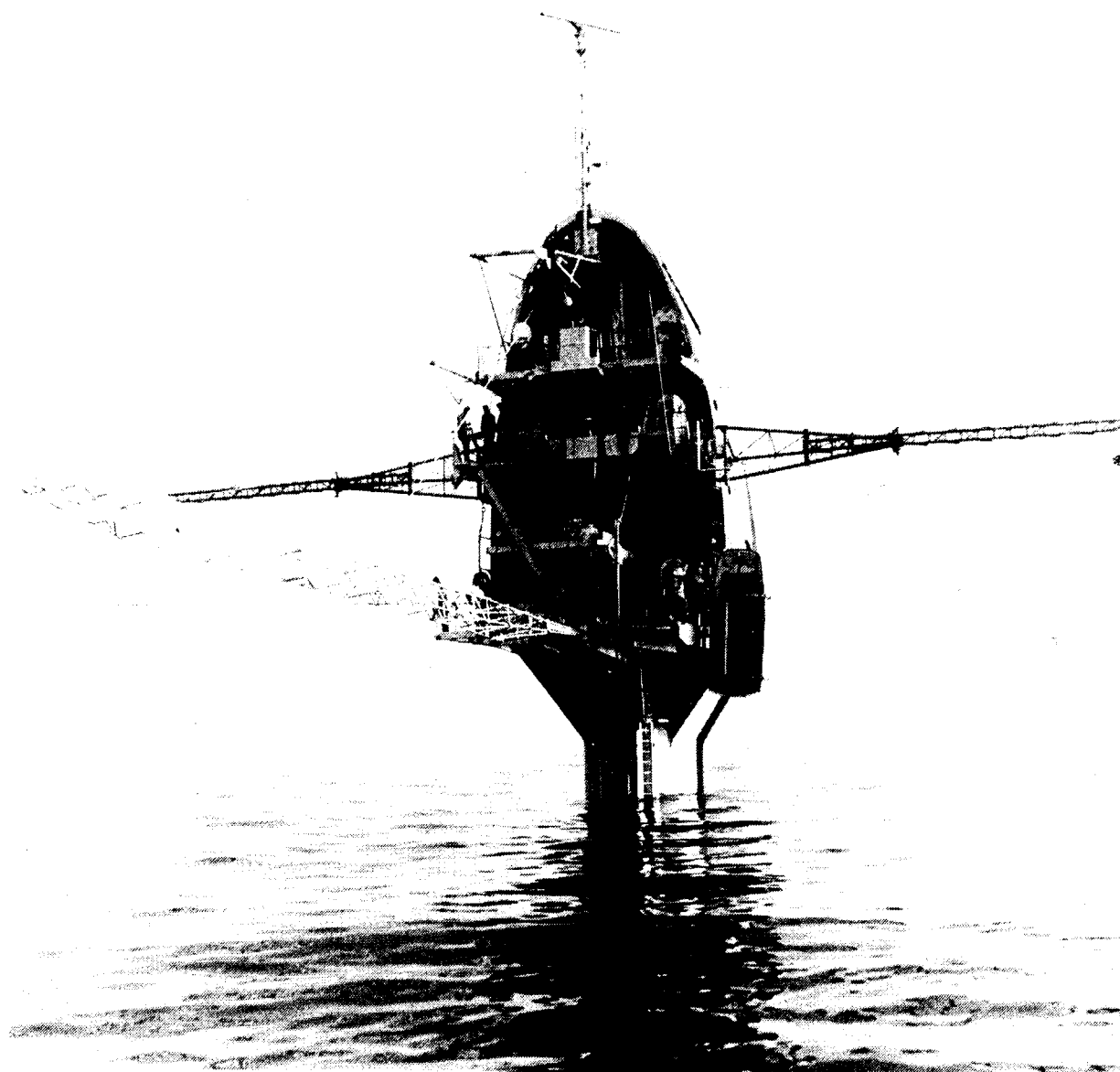
Scripps Institution was originally an independent biological research laboratory, which became an integral part of the University of California in 1912. At that time the laboratory was given the Scripps name in recognition of the interest and financial support of Ellen Browning Scripps and E.W. Scripps.

Research at Scripps now 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.

Scripps maintains three ships capable of multidisciplinary ocean-study programs in any part of the world's oceans ranging from short, offshore trips to worldwide expeditions and one ship outfitted for operations closer to San Diego. During the year ending June 1979, Scripps ships operated 1,041 days and logged 111,898 nautical miles. Scientists aboard R/V *Melville*, Scripps's largest ship, concluded the research project *Indomed* in 1979, the institution's longest expedition in time away from home port. Some 76,500 miles were traveled throughout the Indian Ocean, in the Mediterranean Sea, the Red Sea, and throughout the Atlantic and northeast Pacific Oceans over a nineteen-month period. Scripps's one-year-old R/V

New Horizon, a vessel dedicated primarily to operations between the northern California border and the tip of Baja California, completed several short cruises involving biological, physical oceanography, and geological studies. Mariana Expedition aboard R/V *Thomas Washington* took Scripps scientists to the Mariana Trench in the western Pacific, site of the deepest region in the world's oceans, and throughout Southeast Asia. Experiments during the cruise included studies to assess the feasibility of depositing radioactive wastes beneath deep-sea sediments. *Alpha Helix* (an NSF-provided ship now transferred to another academic institution) conducted studies near the Galápagos Islands, in the Caribbean, and off Australia and the Philippines. *Ellen B. Scripps*, smallest in the fleet, made three-dozen sorties off San Diego to collect specimens, test equipment, and other programs, often under graduate-student direction.



Research platforms FLIP and ORB were used for several operations in waters near San Diego.

Investigations supported by contracts and grants, primarily federal, cover a wide latitude of marine research. The general research effort is conducted by three divisions: Marine Biology Research Division; Geological Research Division; and Ocean Research Division, including the Physical and Chemical Oceanographic Data Facility, North Pacific Experiment (NORPAX), and the Climate Research Group. The diversity of Scripps's work is extended by three special-purpose laboratories: the Marine Physical Laboratory, the Physiological Research Laboratory, and the Visibility Laboratory. Other specialized groups are also located on campus: Marine Life Research Group, sponsored by the state of California, and the Deep Sea Drilling Project. A ship operations and marine technical support unit provides essential services and

facilities to all research units of the institution.

The 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 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 one hundred research scientists, many of whom have a regularly scheduled part 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 college level. UC San Diego 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 explains research undertaken at Scripps. The aquarium-museum is open from 9:00 a.m. to 5:00 p.m. daily, without charge.

La Jolla Laboratory of the University of California's Institute of Geophysics and Planetary Physics 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 fifty-four projects and

forty-nine trainees supported on UC campuses, and 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.

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, Programs of Instruction" for further details on study programs, requirements, degrees, and courses. For additional information, write:

Graduate Student Information
Scripps Institution of Oceanography
1166 Ritter Hall, A-008
University of California,
San Diego
La Jolla, California 92093

The Faculty of Scripps Institution of Oceanography

NAME	TITLE	DEPARTMENT
Anderson, Victor C., Ph.D.	Professor	EECS
Arrhenius, Gustaf O., Ph.D., D.Sc.	Professor	SIO
Arthur, Robert S., Ph.D.	Professor Emeritus	SIO
Backus, George E., Ph.D.	Professor	SIO
Bada, Jeffrey, Ph.D.	Associate Professor	SIO
Benson, Andrew A., Ph.D.	Professor	SIO
Berger, Wolfgang H., Ph.D.	Associate Professor	SIO
Bradner, Hugh, Ph.D.	Professor	AMES
Brune, James N., Ph.D.	Professor	SIO
Bullock, Theodore H., Ph.D.	Professor	Neurosciences
Cox, Charles S., Ph.D.	Professor	SIO
Craig, Harmon, Ph.D.	Professor	SIO
Curry, Joseph R., Ph.D.	Professor	SIO
Davis, Russ E., Ph.D.	Professor	SIO
Dayton, Paul K., Ph.D.	Associate Professor	SIO
Dorman, LeRoy M., Ph.D.	Associate Professor	SIO
Duntley, Seibert Q., Sc.D.	Professor Emeritus	SIO
Engel, A.E.J., Ph.D.	Professor	SIO
Enright James T., Ph.D.	Professor	SIO
Faulkner, D. John, Ph.D.	Associate Professor	SIO
Fox, Denis L., Ph.D.	Professor Emeritus	SIO
Gibson, Carl H., Ph.D.	Associate Professor	AMES/SIO
Gieskes, Joris M.T.M., Ph.D.	Associate Professor	SIO
Gilbert, J. Freeman, Ph.D.	Professor	SIO
Goldberg, Edward D., Ph.D.	Professor	SIO
Goodman, Daniel, Ph.D.	Assistant Professor	SIO
Guza, Robert T., Ph.D.	Assistant Professor	SIO

Hammel, Harold T., Ph.D.	Professor	SIO/Medical
Haubrich, Richard A., Ph.D.	Professor	SIO
Hawkins, James W., Jr., Ph.D.	Professor	SIO
Haxo, F.T., Ph.D.	Professor	SIO
Heiligenberg, Walter F., Ph.D.	Professor	SIO
Hendershott, Myrl C., Ph.D.	Professor	SIO
Hessler, Robert R., Ph.D.	Professor	SIO
Hodgkiss, William S., Jr., Ph.D.	Assistant Professor	SIO
Holland, Nicholas D., Ph.D.	Professor	SIO
Inman, Douglas L., Ph.D.	Professor	SIO
Johnson, Martin W., Ph.D.	Professor Emeritus	SIO
Jordan, Thomas H., Ph.D.	Associate Professor	SIO
Kastner, Miriam, Ph.D.	Associate Professor	SIO
Keeling, Charles D., Ph.D.	Professor	SIO
Lal, Devendra, Ph.D.	Professor	SIO
Lange, G. David, Ph.D.	Associate Professor	Neurosciences
Lewin, Ralph A., Ph.D., Sc.C.	Professor	SIO
Macdougall, J.D., Ph.D.	Assistant Professor	SIO
McGowan, John A., Ph.D.	Professor	SIO
Menard, H. William, Ph.D.	Professor	SIO
Miles, John W., Ph.D.	Professor	AMES
Mullin, Michael M., Ph.D.	Professor	SIO
Munk, Walter H., Ph.D.	Professor	SIO
Nealson, Kenneth, Ph.D.	Associate Professor	SIO
Newman, William A., Ph.D.	Professor	SIO
Nierenberg, William A., Ph.D.	Professor, Director of the Institution	SIO
Parker, Robert L., Ph.D.	Professor	SIO
Peterson, Melvin N.A., Ph.D.	Associate Professor	SIO
Phleger, Fred B., Ph.D.	Professor Emeritus	SIO
Raitt, Russell W., Ph.D.	Professor Emeritus	SIO
Rakestraw, Norris W., Ph.D.	Professor Emeritus	SIO
Reid, Joseph L., M.S.	Professor	SIO
Revelle, Roger R., Ph.D.	Professor, Recalled to Active Duty, Director Emeritus	Political Science
Rosenblatt, Richard H., Ph.D.	Professor	SIO
Salmon, Richard L., Ph.D.	Assistant Professor	SIO
Scholander, P.F., M.D., Ph.D.	Professor Emeritus	SIO
Shepard, Francis P., Ph.D.	Professor Emeritus	SIO
Shor, George G., Jr., Ph.D.	Professor	SIO
Somero, George N., Ph.D.	Associate Professor	SIO

Somerville, Richard C.J., Ph.D.	Professor	SIO
Spiess, Fred N., Ph.D.	Professor	SIO
Suess, Hans E., Ph.D.	Professor Emeritus	Chemistry
Thierstein, Hans R., Ph.D.	Assistant Professor	SIO
Vacquier, Victor, M.A.	Professor Emeritus	SIO
Vacquier, Victor D., Ph.D.	Associate Professor	SIO
Van Atta, Charles W., Ph.D.	Professor	AMES/SIO
Volcani, Benjamin E., Ph.D.	Professor	SIO
Wheelock, Charles D., M.S.	Professor Emeritus	SIO
White, Fred N., Ph.D.	Professor	Medicine
Winant, Clinton D., Ph.D.	Associate Professor	SIO
Winterer, Edward L., Ph.D.	Professor	SIO
ZoBell, Claude E., Ph.D.	Professor Emeritus	SIO





Administration of Scripps Institution of Oceanography

Director	William A. Nierenberg
Deputy Director	Jeffery D. Frautschy
Associate Directors	Robert L. Fisher George G. Shor, Jr.
Assistant Director	George L. Matson

Research/Academic Divisions of Scripps Institution of Oceanography

Geological Research Division	William R. Riedel
Marine Biology Research Division	Robert R. Hessler
Ocean Research Division	Russ E. Davis
Marine Physical Laboratory	(Open)
Visibility Laboratory	Roswell W. Austin (Acting Director)
Physiological Research Laboratory	Fred N. White
Marine Life Research Group	Joseph L. Reid
Deep Sea Drilling Project	Melvin N. A. Peterson
Graduate Department of SIO	Michael M. Mullin

University of California Associated Institutes

Institute of Geophysics and Planetary Physics	Walter H. Munk J. Freeman Gilbert
Institute of Marine Resources	Fred Noel Spiess

Special Groups, Facilities, and Collections

Analytical Facility, Benthic Invertebrates, Cardiovascular Research Facility, Climate Research Group, Deep Sea Drilling Project Core Repository, Diving Facility, Experimental Aquarium, Geological Core Locker, Geological Data Center, Hydraulics Laboratory, International Deployment of Accelerometers, Kendall Frost Mission Bay Marsh Reserve, Marine Botany Collection, Marine Invertebrates, Marine Science Development and Outfitting Shop, Marine Vertebrates, Mass Spectrographic Equipment, Mt. Soledad Radioisotope Laboratory, Neurobiology Unit, Nimitz Marine Facility (ship-operating base), North Pacific Experiment, Oceanographic Data Archives, Petrological Laboratory, Physical and Chemical Oceanographic Data Facility, Physiological Research Laboratory Pool Facility, Planktonic Invertebrates, Radio Station WWD (for ship communication), San Vicente Lake Calibration Facility, Scripps Library, Scripps Pier, Scripps Satellite — Oceanography Facility, Seawater System, Shipboard Computer Group, Ship Operations and Marine Technical Support, Shore Processes Study Group, Underwater Research Areas, Scripps Aquarium-Museum.

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.

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]

AFRO-AMERICAN LITERATURE

See Literature

ANTHROPOLOGY

OFFICE: 8012 Humanities and Social Sciences Building, Muir College

Professors:

F. G. Bailey, Ph.D.

Roy G. D'Andrade, Ph.D.

Robert I. Levy, M.D.

Gananath Obeyesekere, Ph.D.

Theodore Schwartz, Ph.D. (*Chairman*)

Melford E. Spiro, Ph.D.

Marc J. Swartz, Ph.D.

Associate Professors:

David K. Jordan, Ph.D.

Michael Meeker, Ph.D.

Donald F. Tuzin, Ph.D.

Assistant Professors:

Shirley C. Strum, Ph.D.

Julie M. Taylor, Ph.D.

Lecturer with Security of Employment:

Joyce E. Justus, Ph.D.

Associated Faculty:

Lola Romanucci-Ross, Ph.D., *Associate Professor, Community Medicine*

Robert C. Westerman, Ph.D., *Associate Librarian*

Anthropology, the "Study of man," is a humanistic social science dedicated to understanding physical and cultural diversity in the species. With generally increased awareness of the importance of 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 UC San Diego, the concentration is on cultural, social, and psychological anthropology, with theoretical emphasis on such topics as culture process and identity, social systems, politics, the family, and — to an extent that is unusual among anthropology departments — cognitive and personality psychology. Specialities are also available in urban and applied studies, and in primatology and physical anthropology. Courses utilize a comparative perspective, drawing on materials from a wide variety of cultural settings, especially Sub-Saharan Africa, the Near East, Asia, Europe, the Caribbean, Latin America, and the islands of the Pacific. The department offers undergraduate minor and major programs, a senior thesis program, and a graduate program leading to the doctoral degree.

The Undergraduate Program

Lower Division

Lower-division offerings in anthropology are concentrated mainly in a series of five courses, and numbered AN 22, 23,

24, 25, and 26. Collectively, the courses are designed to provide a comprehensive orientation to the ideas and methods of anthropological investigation and a familiarity with case materials from a number of different societies. Whereas any three of these fulfill the social science requirement for the various colleges, 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, 23, or 24.

Other lower-division courses will vary from year to year.

The Minor

The minor consists of six anthropology courses, at least three of which must be upper-division. Transfer credits will be acceptable from other anthropology departments so long as three or more of the courses are taken here. Transfer courses will not be acceptable from non-anthropology departments. Education Abroad Program credits will be 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, or Warren College, including the following requirements of the Department of Anthropology:

1. A minimum of twelve 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 1, above). All or some of the courses in this

Anthropology

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) and one directed group study course (198). 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 (C) is required, both as an overall average in all anthropology courses and in the AN 105-106-107 sequence considered separately.
5. Majors will be required to have at least seven of their twelve anthropology courses at 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 the systems 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. It is recommended that majors obtain a background in basic statistical techniques, as offered in the lower division Mathematics courses 5A and 5B (Introduction to Mathematics) or 80A and 80B (Basic Statistics).

(OPTIONAL) DEPARTMENTAL SENIOR THESIS PROGRAM

Undertaken in addition to the regular major requirements, the senior thesis is prepared during three successive quarters of AN 196: Thesis Research. The thesis will be evaluated by a committee consisting of the thesis adviser and one other faculty member (or, in event of disagreement, two other faculty members) appointed by the director of the program. The thesis adviser will have sole responsibility for the grades the student receives in the three courses. The reading committee shall decide whether the thesis merits departmental honors or not. Students are admitted to the 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 (AN 105, 106, 107), and (2) achieve grade-point averages of at least 3.6 (overall) and 3.6 (anthropology) by the end of the junior year. Interested students should apply to the department's undergraduate adviser by the end of the sixth week of the quarter prior to their advancement to senior standing.

The Graduate Program

The Department of Anthropology offers training in social, cultural, and psychological anthropology. The aim of the graduate program is to give the student the theoretical background and 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 intention of proceeding to the doctoral degree; however, effective fall, 1978 this is achieved in two stages, the master's degree and the doctoral degree itself.

Admission to the graduate program occurs in the fall quarter only, save by special waiver.

Registration Restrictions

In order to encourage students to select an adequate range of elective departmental seminars, first-year graduate students may not register for AN 209, AN 231, or AN 253. In addition, until a student attains Ph.D. candidacy, no more than one 290-level course may be taken at a time and no 290-level courses in anthropology may be taken simultaneously with any course in another department unless the student simultaneously takes another 100- or 200-level anthropology course.

Waiver of Requirements

A decision to waive any requirements for either the master's degree or the Ph.D. must be made by the full faculty, not the student's doctoral adviser or committee.

Graduate Students' Committees

One member of the department faculty functions as the "graduate adviser" and fulfills, for the most part, the bureaucratic needs of beginning graduate students. In the doctoral portion of the program, each student has a "departmental committee" and a "doctoral committee," the latter an

expansion of the former. The chairperson of both of these committees serves as the student's adviser and is referred to below as the "doctoral adviser" in contrast to the "graduate adviser."

Forming Departmental and Doctoral Committees

Students who entered the program before fall, 1978 are required to select doctoral advisers before preregistration for winter quarter of the second year. Students who entered in fall, 1978 or later are required to select doctoral advisers before pre-registration for the winter quarter of the third year. The procedure in either case is the same. The student is required to advise the department chairperson in writing of the name of the faculty adviser. The new doctoral adviser, after consulting with the student and with potential departmental committee members that the adviser and student have agreed upon, then informs the department chairperson in writing of the names of the two (or more) other members of the anthropology faculty who will serve on the student's departmental committee and of their willingness to serve.

A student's doctoral adviser serves as long as both student and adviser are satisfied with the arrangement. However, after the deadlines mentioned in the previous paragraph, a student must have a doctoral adviser at all times. The doctoral adviser is responsible for guiding the student's course of study. Only the doctoral adviser (and in emergencies the department chairperson) may sign registration cards for students once a doctoral adviser has been selected. Any faculty member in any department who is related to a student's departmental or doctoral committee in any way whatever must be informed by the student's doctoral adviser of any changes in the composition of these committees.

Note that the student's departmental committee is developed by the student and the doctoral adviser and formally appointed by the department chairperson. The doctoral committee, in contrast, is officially appointed by the graduate dean of the campus after all other requirements for doctoral candidacy have been completed. It is an examining committee and normally includes the members of the departmental committee with the addition of two faculty members from other departments, at least one of whom must be tenured. The student's doctoral adviser serves as the chairperson of both committees.

Until the student has attained Ph.D. candidacy, the departmental committee will meet with him or her at the end of each year beginning at the end of the second year and also within two months before the oral qualifying examination to assess strengths and weaknesses of the training that far (including a knowledge of basic anthropological issues, progress in gaining required area knowledge, and progress in developing a dissertation specialty) and to formulate a plan to make up any deficiencies during the summer or during the following year (i.e., before the student undertakes field research); and each student's doctoral adviser will report the situation to the faculty as a whole. Note that this is not an examination, but a status-of-systems report.

THE MASTER OF ARTS DEGREE

Any student entering prior to fall, 1978 who wishes an M.A. may apply to the graduate adviser after completing thirty-six units with a minimum 3.0 GPA. The adviser and the department chairperson will appoint a two-person examining committee. Two exam questions will be developed with the committee, and within a specified time the student will write an essay of ten to fifteen pages on each of these questions. The committee will assess whether or not the student has passed the exam. If the committee members cannot agree, a third member may be appointed by the graduate adviser in consultation with the department chairperson. The following material refers to students entering in the fall quarter, 1978 or later.

Students entering the graduate program must complete a master's degree before being approved to continue toward the doctorate. Entering students who already have a master's degree in anthropology are barred by the university from taking a second master's degree, but they are nonetheless required by the department to complete course work described below as preparatory for the master's degree, to take the same statistics examination, and to write a qualifying paper sufficient to judge their capacity for scholarship and their ability to handle conceptual and analytic tasks.

Requirements for Master's Degree:

1. Specified Courses:

- 205* Social Anthropology
- 206* Cultural Anthropology
- 207* Psychological Anthropology

- 210 Ethnographic Field Methods
- 230A Departmental Colloquium (five quarters)
- 295 Master's Thesis Preparation Seminar (two quarters)

*Attendance at correspondingly numbered upper-division courses (AN 105, 106, 107) and completion of the upper-division examinations may be required by the instructor.

Incompletes will not be allowed for these courses. Exceptions to this must be approved by the faculty or by a committee consisting of the chairperson, the graduate adviser, and the instructor of the course. Participation in these courses by other than anthropology graduate students requires the consent of the faculty as a whole, not just the professor in charge of the course. After review of returned course papers, students should return them to the departmental graduate secretary to be kept in a central file in order to facilitate the evaluation made in the spring quarter.

- 2. Statistics Examination:** All graduate students are required to pass a departmental examination in elementary statistics. If it is necessary to prepare for this examination by taking a course in statistics, the department offers an upper-division course, AN 112, that would fulfill this requirement.

The Master's Thesis

Upon completion of (or registration for the final quarter of 230A and 295) requirements 1 and 2 above, the student may be advanced to master's candidacy. When this happens (normally during the fourth quarter in residence), a master's thesis committee is appointed by the department chairperson with the approval of the dean of graduate studies. This committee consists of two faculty members from the Department of Anthropology and one, preferably tenured, from a different department. A library thesis, approximately 50 to 150 pages in length, must be submitted to this committee, which must approve the thesis unanimously. Acceptance of the thesis by the university librarian represents the final step in completion of all requirements for a Master of Arts degree. (In the case of students submitting qualifying papers, as described above, the papers and their approval are handled by informal committees appointed by the department chairperson, and they need not be submitted to the university librarian.) Preparation of the M.A. thesis or qualifying paper is to be completed by the end of the sixth quarter of residence (typically spring quarter). The thesis or qualifying paper must be

submitted and reviewed early in the spring quarter of the second year if the student wishes to be considered for financial support during the third year.

Evaluation

Evaluation by the faculty is made early in the spring quarter of the students' first year to determine whether they should continue in the program, and again early in the winter quarter of the second year. Each time, a written progress assessment is provided to the students by the faculty. This progress assessment is intended to help students evaluate their overall progress toward the master's degree and to identify any problems as early as possible.

THE DOCTOR OF PHILOSOPHY DEGREE

Admission to the doctoral portion of the graduate program is open on the basis of faculty review of students who:

- 1) formally request such admission in writing;
- 2) have completed a master's thesis or qualifying paper judged to be of superior quality; and
- 3) have completed the M.A. course work at a level of excellence which shows good promise of professional success in anthropology.

Requirements for Doctoral Candidacy:

1. Specified Courses:

- 209 Research in Psychological Anthropology
- 231 Social Theory and Social Anthropology
- 253 History of Anthropology
- *One course in linguistics (a number of options are provided each year in the Department of Linguistics)

*This requirement may be waived for students with prior training in linguistics

- 2. Foreign Language Examination:** All students are 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 will be an informal in-house exam administered by a member of our faculty and consisting of an adequate oral translation of part of an anthropology article into English.

3. Prefield Qualifying Examination:

After completion of the above-mentioned requirements the student stands for the doctoral qualifying examination, as required by the Office of Graduate Studies. 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.

The Fieldwork Proposal

As doctoral advisers students may either retain the chairpersons of their masters' thesis committees or select new faculty members. Typically, during the first year after admission to the doctoral portion of the program, students each present a research proposal to the members of their respective departmental committees. A dissertation research proposal sets forth a specific plan of research, normally involving intensive fieldwork. The research proposal may or may not build upon the student's M.A. thesis.

If the proposal is informally judged by committee members to be ready to be defended, an oral qualifying examination is scheduled. The oral qualifying examination is administered by the student's full doctoral committee.

A copy of the student's field research proposal must be in the hands of all faculty members ten days before the oral qualifying examination. Fieldwork proposals may not exceed twenty double-spaced typed pages. A one-paragraph abstract of the proposal is not included in this space limit. Note that there is no obligation to reach twenty pages, and shorter proposals are acceptable. Graduate students may not use department personnel or equipment to make copies of pre-fieldwork proposals or dissertations or dissertation abstracts.

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, although only members of the anthropology faculty and of the student's doctoral committee may ask questions. A resume of the student's dissertation must be in the hands of all faculty members ten days before the dis-

sertation hearing. A full copy of the student's dissertation must be in hands 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 hearing. 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.

Teaching

In order to acquire adequate teaching experience, each student in the graduate program is required to participate as an assistant in the teaching activities designated by the department during one quarter in each of the student's first three years in residence. This obligation is discharged under the auspices of the course entitled "Anthropology 500: Apprentice Teaching."

Courses

NOTE: For changes in course offerings or additions made after publication of the *General Catalog*, Check the *Schedule of Classes* issued fall 1980, winter 1981, and spring 1981.

Lower Division

12. Chinese Society and Culture (4)

A description and interpretation of the major institutions and culture patterns of traditional China. (May not be offered 1980-81.)

13. Leadership and Order in Non-Western Societies (4)

An anthropological perspective on the means by which activities are coordinated and cooperation made possible in societies quite different from those of the urban, industrial West. Attention will be directed to conflict and its social management as well as to legitimacy and its sources.

16. Anthropology of the City (4)

Contemporary dilemmas and evolution of urban life. Topics include: family and kinship; race, class, and ethnic relations; poverty and affluence; community and neighborhood; work and leisure organization; modern problems of planning, development, resource use, and change in an urbanizing world.

22. Introduction to the Study of Man (4)

An introduction to the anthropological approach to the understanding of human behavior, with an examination of data from a selection of societies and cultures.

23. Social Structure and Change (4)

Examination of the problem of the maintenance of and change in human societies and other groups: factionalism, acculturation, assimilation, social evolution, urbanization, religious movements, and economic development. (Not offered in 1980-81.)

24. Religion, Symbolism, Ideology and Personality (4)

Examination of the roles of symbolism and ideology in human life with particular attention to religion and other organized systems of belief and practice.

25. Introduction to Human Evolution (4)

As an introduction to human evolution from the perspective of physical anthropology, this course considers evolutionary theory and time, evolution of the primates, evolution of the hominids. Emphasis placed on evidence from fossil remains and from behavioral studies of living primates.

26. The Prehistoric World (4)

A review of human culture from the Neanderthals 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 to population growth.

73. Latin American Culture (4)

Examines the myth of the bandit as a focus of wider central Latin American culture themes. Concentrates on Argentina, Brazil, and the American Southwest.

Upper Division

100. Development of Primate Perspectives (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 25 or 159; not open to students who have completed AN 154.*

101. Models of Social Behavior in Animals and Man (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 25. (May not be offered in 1980-81.)*

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 desirable. *Prerequisite: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

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.

105. Social Anthropology (4)

A systematic analysis of social systems 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.*

106. Cultural Anthropology (4)

This course considers the nature of culture: its evolution, forms and processes; the variation and distribution of its content among the individuals of a society; the evaluation of cultures as adaptive and fulfilling systems. *Prerequisite: AN 22 or 105, or introductory anthropology at another university.*

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.*

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 precommunist 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.

110. Issues in Physical Anthropology (4)

This is a seminar for students who wish to explore special topics in physical anthropology. The course focus will change year to year. May be repeated one time for credit. *Prerequisites: AN 25 or 100, one other course in physical anthropology, and consent of instructor.*

111. Modernization and Development (4)

Survey of theories of social and economic change. Social and economic consequences of technological innovation. The evolution of modern industrial society and its contemporary dilemmas. Application of anthropological theory to case studies of the transformation of rural economy and society. *Prerequisite: AN 22 or introductory anthropology at another university.*

112. Quantitative Techniques in Anthropology (4)

An introduction to the use of statistics and computers in the analysis of social and cultural data, including discussion of problems involved in the verification of social science theories. *Prerequisite: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

113. Applications of Anthropology: Wildlife Research, Conservation and Education, the Role of Zoological Parks (4)

Wildlife conservation is a growing concern as increasing numbers of wild animals and natural habitats face extinction. Zoological parks are trying to meet conservation needs in several ways: improved public education, breeding endangered species in captivity, reintroducing species preserved in captivity to their natural environment. This course will introduce some of the critical issues in wildlife conservation and assess the future direction programs may take. *Prerequisites: upper-division standing and 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. 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.

116A. Urban Anthropology (4)

The evolution, form systemics and culture of the city as artifact and environment for its component individuals, groups, and communities, explored in terms of the methods and perspectives of anthropology. *Prerequisite: AN 22 or introductory anthropology at another university. 116A is prerequisite to 116B. 116A not open for credit to students who have taken AN 116. (May not be offered in 1980-81.)*

116B. Urban Anthropology Research Seminar (4)

This course will broach the application of social science theory and methods to the planning and realization of the growth, form, and quality of urban life in the San Diego area. The seminar will involve research, field trips, and discussions with diverse participants in the urban growth process. *Prerequisites: AN 116A and consent of instructor. (May not be offered in 1980-81.)*

118. Cognitive Anthropology (4)

This course will consider the relation between cultural behavior and cognitive process. Selected topics from the fields of ethno-science, semantic and grammatical analysis, decision-making, and belief systems will be discussed. *Prerequisite: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

119. Social and Cultural Change (4)

Theories of social evolution, diffusion, acculturation, pattern dynamics, innovation, revitalization and revolution, and modernization are examined, and illustrated with cross-cultural materials. *Prerequisites: AN 22 or 23, and upper-division standing. (May not be offered in 1980-81.)*

120. Buddhism and Society (4)

Buddhism as an ideology and an institution in relationship to the society, culture, and personality in which it is found. *Prerequisites: upper-division standing, major in social science or humanities. (May not be offered in 1980-81.)*

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. (May not be offered in 1980-81.)*

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. Language and Culture (4)

This course explores language acquisition, idiolects, social dialects, levels of linguistics usage, language and world view, the role of language in cultural interaction and social structure, and planned language change, including language problems in new nations and at an international level. (May not be offered in 1980-81.)

128. The Anthropology of Medicine (4)

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. Prehistory and Culture (4)

A review of human culture from the Neanderthals through the growth of Bronze Age empires, focusing on major cultural "inventions" such as agriculture, metallurgy, and writing. *Prerequisite: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

135. Indian Society (4)

A study of the social structure of India, with particular reference to caste and political organization. *Prerequisite: upper-division standing. (May not be offered in 1980-81.)*

136. Caribbean Society and Culture (4)

A study of the comparative implications of migration, slavery and colonialism, and of the contributions of various immigrant groups to the development of national cultures.

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. (May not be offered in 1980-81.)*

139. Symbolic Classification (4)

An examination of themes related to symbolic classification, carried out in the context of the classics of the French sociological and British social anthropological schools. (May not be offered in 1980-81.)

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.*

144. Chinese Personality (4)

This course explores the relation between culture and personality in Chinese society, stressing child training, family life, and cultural reflections on common personality orientations. *Prerequisite: A prior course on personality is desirable background. (May not be offered in 1980-81.)*

149. Hinduism (4)

This course will consider Hinduism from an anthropological and psychological perspective, with an emphasis on the Trans-Hinduism of Nepal. The emphasis is on the symbolic and communicative dimensions of Hinduism, and their meanings for community and individual life in Nepal.

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, fractionalism, etc.) *Prerequisite: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

152. Shame and Guilt: Psychological and Anthropological Perspectives (4)

Anthropologists have written extensively on societies where concepts of honor and shame are predominant but little about guilt except to make an overly simple distinction between shame and guilt cultures. The seminar will discuss these and related issues through a review of the psychological and anthropological literature. *Prerequisite: consent of instructor.*

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.*

154. Witches, Warriors, and Wives: Women and Symbolism (4)

An examination of beliefs about women and men in different cultures, including the West, through case studies of historical leaders past and present as well as mythical figures. *Prerequisite: AN 22 or introductory 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. (May not be offered in 1980-81.)*

158. Psychoanalytic Anthropology (4)

A critical examination of the anthropological works of Freud and of selected Freudian anthropologists and an assessment of their influence on anthropological theory. *Prerequisites: upper-division standing: AN 22, 23, or 24. (May not be offered in 1980-81.)*

160. Ecstatic Religion (4)

This course deals with the analysis of such phenomena as spirit possession, shamanism, prophecy, trance, and related topics. Emphasis will be on the relationship between the individual's motives and the cultural form in which they are expressed. The cultural and social contexts of ecstatic religion as well as the sociological factors underlying the transformation of one type of ecstatic religion into another will also be considered. *Prerequisite: consent of instructor. (May not be offered in 1980-81.)*

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: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

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. (May not be offered in 1980-81.)*

163. Politics and Culture (4)

The problems of analyzing political events within a specific cultural context are explored. The readings include political ethnographies and political literature from the Mediterranean area, the Near East, Africa, Southeast Asia, and Mexico. *Prerequisite: one course in anthropology here or elsewhere. (May not be offered in 1980-81.)*

164. Political Myth in Latin America (4)

Methods and theory of recording and analyzing political myth and symbolism in urban society, emphasizing the role of mythic patterns in current politics. Examination of political symbolism in contexts of ideology, history, myth, and political culture. *Prerequisite: AN 22 or introductory anthropology at another university. (May not be offered in 1980-81.)*

166. Religion 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.*

Anthropology

167. Anthropological Perspective on History (4)

This course will consider relations between the two fields illustrated by contemporary Latin American popular versions of history and contrasting academic versions. Concentration on the relative "reality" of tradition, history, and myth. *Prerequisite: AN 22 or introductory anthropology at another university.* (May not be offered in 1980-81.)

171. Near East Seminar (4)

The seminar will focus on a special problem or a particular area of the Near East. May be repeated for credit one time. *Prerequisite: consent of instructor.* Some background of Near Eastern studies required. (May not be offered in 1980-81.)

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. Video-tape and other recording techniques will be employed.

173. Themes in Latin American Culture (4)

An introduction to Latin American cultures focusing on similarities and differences among case studies. Research paper within one area instead of exam. *Prerequisite: AN 22 or introductory anthropology at another university.* (May not be offered in 1980-81.)

190. Culture/Personality and the Education Process (4)

Theories and societal assumptions about the teaching-learning process will be examined both from an interdisciplinary and cross-cultural perspective. Field observation techniques will be an adjunct to the lectures. (May not be offered in 1980-81.)

196. Thesis Research (4)

Independent preparation of a senior thesis under the supervision of a faculty member or committee. The final grade assignment will not be made until the third quarter and will be based on the thesis submitted. May be repeated for credit two times. *Prerequisite: students will be admitted by invitation of the department.*

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.)

198. Directed Group Study (2 or 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.) *Prerequisites: consent of instructor and upper-division standing.*

199. Independent Study (2 or 4)

Independent study and research under the direction of a member of the staff. (P/NP grades only.) *Prerequisite: special permission of instructor.*

Graduate

204. Applied Anthropologists (3)

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.* (May not be offered in 1980-81.)

205. Social Anthropology (6)

A systematic analysis of social systems, and of the concepts and constructs required for cross-cultural and comparative study of human societies. *Prerequisite: graduate standing in social science or humanities.*

206. Cultural Anthropology (6)

The course will intensively survey theories of the nature of culture, its forms and transformations, and the analysis of culture in behavior. *Prerequisite: AN 205.*

207. Psychological Anthropology (6)

Consideration of interrelationships of aspects of individual personality and various aspects of sociocultural systems. The relation of sociocultural contexts to motives, values, cognition, personal adjustment, stress and pathology, and to qualities of personal experience will be emphasized. *Prerequisites: AN 205 and 206.*

209. Research in Psychological Anthropology (3)

An introduction to a wide range of techniques including interview, observation, and testing leading to psychological inferences about groups and individuals in a cross-cultural context. *Prerequisite: graduate standing in anthropology.*

210. Ethnographic Field Methods (1-6)

This seminar provides graduate students with an opportunity to use and discuss the main field methods in social and cultural anthropology and to consider the problems associated with these methods. The genealogical method, various types of interviewing, and observational techniques will be among those discussed and employed by students in the practicum which is part of the course. *Prerequisite: graduate standing in anthropology.*

216. Theory and Methods in Urban Anthropology (3)

This course will survey relevant theory, methods, opportunities and needs in the comparative, systemic, or problem-related research on both Western and non-Western urban settlements. (May not be offered in 1980-81.)

217. Current Theoretical Issues in Anthropology (2)

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 (3)

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethno-science, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisite: graduate standing in anthropology or psychology.* (May not be offered in 1980-81.)

222. Anthropological Analysis in Regional Context: Theory and Ethnography in Melanesia (3)

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," "single-society studies" within Melanesian ethnography. Individual research is required. *Prerequisite: completion of first year of graduate study in anthropology or consent of instructor.* (May not be offered in 1980-81.)

225. Aspects of Linguistic Anthropology (3)

Designed to follow an introduction to general linguistics, this course focuses on the use made of linguistic methods, theories, and data by anthropologists from about 1920 to date, with particular emphasis on contemporary studies of the social use of language. *Prerequisite: an introductory course in linguistics.* (May not be offered in 1980-81.)

229. Seminar on Religion (3)

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 of a more substantive one like shamanism. Topic for 1980-81: "Male and Female Metaphors and Symbols in Theology and Ritual." *Prerequisite: graduate standing.*

230A. Department Colloquium (1)

Forum for presentation of papers by students, faculty, and guests will be offered quarterly. *Prerequisite: graduate standing in anthropology at pre-M.A. level.*

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).*

230C. Department Colloquium (1)

Forum for presentation of papers by students, faculty, and guests. *Prerequisite: graduate standing in anthropology at post-fieldwork level (dissertation write-up level).*

231. Social Theory and Social Anthropology (3)

This seminar will discuss the impact of the major social theorists on social anthropological thinking. Emphasis will be on Marx, Weber, and Durkheim. Selected anthropological monographs showing the influence of these theorists will also be discussed. *Prerequisite: graduate standing in anthropology or consent of instructor.* (May not be offered in 1980-81.)

232. World View (3)

Extensive classic and contemporary readings on world view concepts. General overviews derived from Durkheim/Mauss, Redfield, Hallowell, and Levi-Strauss. Topics include general classification notions, theories of the person, and "Savage Mind" fertilization and domestication. *Prerequisite: graduate standing in anthropology or consent of instructor.* (May not be offered in 1980-81.)

233. Topics in Chinese Society (3)

Will be devoted to a review of current social science research relating to traditional Chinese society. A different theme will be announced for different years.

244. Enculturation: The Acquisition of Culture (3)

This seminar will review recent work in language acquisition and cognitive development in relation to the more inclusive process of the acquisition of culture known in anthropology as "enculturation." Ways of studying the child's emerging cultural competence will be explored. *Prerequisites: AN 106, 107 or 206, 207.* Undergraduate by permission. (May not be offered in 1980-81.)

245. Anthropological Perspectives on Symbolism and Ritual (3)

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.* (May not be offered in 1980-81.)

246. Special Topics in Primate Behavior (3)

Specialized topics of interest to students of human behavior will be considered in relationship to information on non-human primates. *Prerequisites: graduate standing in anthropology.* (May not be offered in 1980-81.)

247. History as Cultural Myth (3)

An anthropological approach to history in cross-cultural and diachronic comparative perspectives. Ideas such as historicism will be seen as basic cultural myths in our society. Relevance of these areas of study to fieldwork in historically complex societies will not be considered. *Prerequisite: graduate standing.*

249. Trantric Hinduism (3)

This seminar will consider Hinduism from an anthropological and psychological perspective, with an emphasis on the Tantric 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.* (May not be offered in 1980-81.)

251. Conflict and Collusion: Some Themes in Political Anthropology (3)

An examination of political processes at the local level with emphasis on examining supports for various aspects of the processes considered (e.g., leadership, factionalism, etc.). Readings will stress case studies and theory. *Prerequisites: graduate standing and major in social science.*

253. History of Anthropology (3)

A treatment of selected themes in the intellectual history of anthropology with a review of various approaches that have been used to analyze the emergence of man's modern ideas about himself. *Prerequisite: graduate standing in anthropology.*

254. Experimental Anthropology (3)

Experimental methods used in anthropology to study culture will be examined. The logic of experiments, relevant theoretical issues, and current techniques and findings will be reviewed. *Prerequisite: graduate standing.*

258. Selected Topics in Psychoanalytic Theory (3)

A critical survey of the psychoanalytic approach to selected topics in anthropology, such as totemism, religion, gender, social character, and symbolism. The topic for each seminar will be posted in advance. *Prerequisite: graduate standing.* (May not be offered in 1980-81.)

259. Semiotics and the Science of Society (3)

The seminar will consist of a detailed discussion of some of the key writings of Durkheim, Mauss, and Levi-Strauss. The works of these authors which have been most influential in anthropology have linked the study of society and a theory of signs. By understanding how this is so, the significance of semiotics as a trend of modern social thought can be gauged. *Prerequisite: graduate standing in social science or humanities.* (May not be offered in 1980-81.)

260. Ecstatic Religion (3)

This course deals with the analysis of such phenomena as spirit possession, shamanism, prophecy, trance, and related topics. Emphasis will be on the relationship between the individual's motives and the cultural form in which they are expressed. The cultural and social contexts of ecstatic religion as well as the sociological factors underlying the transformation of one type of ecstatic religion into another will be considered. *Prerequisite: graduate standing in anthropology and consent of instructor.* (May not be offered in 1980-81.)

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*

269. Themes in the Anthropological Classics: Symbolism (3)

An evaluation of the current theoretical status of symbolic themes considered cross-culturally significant. Early concern with such themes as well as recent problems they have posed will be examined. *Prerequisite: graduate standing* (May not be offered in 1980-81.)

270. Psychiatry and Anthropology (3)

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. Student must begin the program in the fall quarter. (S/U grades only.) *Prerequisites: graduate standing in anthropology and consent of instructor.* (May not be offered in 1980-81.)

271A. Advanced Practicum in Field Research (3)

This course is a seminar in which students will consider the issues receiving particular attention in current anthropological journals and monographs. Grading will be on the basis of library research papers. *Prerequisite: graduate standing in anthropology.*

271B. Advanced Practicum in Field Research (3)

Continuation of AN 271A examining issues receiving particular attention in current anthropological journals and monographs. *Prerequisite: graduate standing in anthropology.*

271C. Advanced Practicum in Field Research (3)

Continuation of 271A and 271B examining issues receiving particular attention in current anthropological journals and monographs. *Prerequisite: advanced standing in anthropology.*

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 (1-4)

The student will work on the master's thesis under the direction of the departmental committee chairperson. The course will normally be taken fall and winter quarter of the student's second year of residence. *Prerequisite: graduate student in anthropology and permission of departmental committee chairperson.* (S/U grades only.)

296. Fieldwork Proposal Preparation (3)

The student will work in cooperation with his or her departmental committee to develop a research proposal for the doctoral research project. The course will not normally be taken more than twice. (S/U grades only.) *Prerequisites: graduate standing in anthropology and permission of departmental committee chairperson.*

297. Research Practicum (1-4)

Supervised advanced research studies with individual topics to be selected according to the student's special interests. (S/U grades only.) *Prerequisite: graduate standing.*

298. Independent Study (1-4)

(S/U grades only.)

299. Thesis Research (1-12)

Prerequisite: Ph.D. candidacy (S/U grades only.)

500. Apprentice Teaching (1-4)

The course, designed to meet the needs of the graduate students who serve as TA's, 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)

OFFICE: 5202 Urey Hall, Revelle College

Professors:

- H. Bradner, Ph.D. (*Professor Emeritus*)
- A. T. Ellis, Ph.D.
- Y. C. Fung, Ph.D.
- G. A. Hegemier, Ph.D.
- M. Intaglietta, Ph.D.
- P. A. Libby, Ph.D.
- S.-C. Lin, Ph.D. (*Associate Director, IPAPS*)
- S. Middleman, D.Eng.
- J. W. Miles, Ph.D.
- D. R. Miller, Ph.D.
- W. Nachbar, Ph.D.
- D. B. Olfe, Ph.D.
- S. S. Penner, Ph.D. (*Director, UC San Diego Energy Center*)
- E. Reissner, D. Eng., Ph.D. (*Professor Emeritus*)
- R. E. Roberson, Ph.D. (*Chairman*)
- A. M. Schneider, Sc.D.
- H. W. Sorenson, Ph.D.
- D. D. Sworder, Ph.D.
- C. W. Van Atta, Ph.D.
- F. A. Williams, Ph.D.
- B. W. Zweifach, Ph.D. (*Professor Emeritus*)

Associate Professors:

- C. H. Gibson, Ph.D.
- J. E. Luco, Ph.D.
- S. Rand, Ph.D.

Assistant Professors:

- D. A. Gough, Ph.D.
- G. W. Schmid-Schoenbein, Ph.D.
- A. V. Sebald, Ph.D.

* * *

- W. B. Bush, Ph.D., *Research Engineer*
- 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*
- W. K. Harrison, Ph.D., *Associate Adjunct Professor of Anesthesiology and Bioengineering*
- K. N. Helland, Ph.D., *Assistant Research Engineer and Lecturer*
- J. P. Howe, Ph.D., *Adjunct Professor of Nuclear Engineering*
- K. Messmer, M.D., *Adjunct Professor of Surgery*
- R. M. Peters, Ph.D., *Professor of Surgery and Bioengineering*

- S. S. Sobin, M.D., Ph.D., *Adjunct Professor of Physiology*
- K. G. P. Sulzmann, Ph.D., *Research Engineer*
- C. P. Wang, Ph.D., *Associate Adjunct Professor*
- J. B. West, M.D., Ph.D., *Professor of Medicine and Bioengineering*
- S. L.-Y. Woo, *Associate Professor of Surgery and Bioengineering in Residence*
- M. R.-T. Yen, *Assistant Research Bioengineer*

The programs and curricula of AMES emphasize education in fundamentals of engineering sciences. These principles provide a common foundation for all engineering subspecialties. Training with this emphasis is likely to serve students well during a career in which engineering practice may change rapidly.

The instructional and research programs are grouped into six major areas: engineering physics, solid and structural mechanics, fluid mechanics, systems science, chemical engineering, and bioengineering. The program is characterized by strong interdisciplinary relationships with the Departments of Physics, Mathematics, Biology, Chemistry, Economics, and Electrical Engineering and Computer Sciences and associated campus institutes such as the UC San Diego Energy Center, the Institute for Geophysics and Planetary Physics, the Institute for Pure and Applied Physical Sciences, Scripps Institution of Oceanography, and the School of Medicine.

The Undergraduate Program

AMES offers two separate undergraduate programs: one, a two-year upper-division major in applied science with options in applied mechanics, bioengineering, and systems science; the other, a four-year program in engineering with specializations in engineering sciences and chemical engineering. Upon satisfactory completion of AMES major requirements and of the student's collegiate requirements, the Bachelor of Science degree or Bachelor of Arts degree is awarded for each program, i.e., in applied mechanics, bioengineering, systems science, engineering sciences, or chemical engineering. However, the department feels that it is in the student's interest to obtain a Bachelor of Science degree.

These programs of study 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 intending to use their undergraduate engineering education as preparation for postgraduate professional training in nontechnical fields such as business administration, law, or medicine. Potential careers in the various fields are briefly described here.

Applied Mechanics is the engineering science which provides the scientific basis of mechanical, aerospace, and civil engineering. The areas of solid and structural mechanics, fluid mechanics, and dynamics are generally considered the cornerstones of applied mechanics, but knowledge of electromagnetic, thermodynamic, and chemical phenomena is frequently required for the treatment of problems in applied mechanics. Solid and structural mechanics is related to the behavior of plastic and elastic materials and of structures involving such materials under static and dynamic loading. The analysis and design of buildings, bridges, dams, machines, and ships are carried out by application of the principles of solid and structural mechanics. Fluid mechanics is a rich field: meteorology, aircraft flight, combustion, oceanography, and rocket propulsion involve significant fluid mechanical phenomena. Finally, dynamics is the study of the motion of bodies. The vibration of machinery, the response of a ship to waves, trajectories of spacecraft, and the response of buildings to earthquakes represent applications of dynamics. Accordingly, there are a variety of employment prospects in the aerospace, transportation, construction, environmental, and defense industries that are open to graduates of this program.

Bioengineering applies the methods and tools of engineering science to biomedical problems. Engineering plays an increasingly important role in medicine. Bioengineers are involved in almost all aspects of this field, in projects that range from basic research in physiology to the improvement of health care delivery. Although additional training is often necessary, the undergraduate bioengineering curriculum introduces students to the fundamentals of such subjects as biomechanics, physiology, transport processes, and medical instrumentation in preparation for advanced study in medical school or graduate school or for careers in the biomedical industry.

Systems Science applies fundamental concepts and mathematical tools for the

analysis and optimal synthesis of complex systems arising in a wide variety of engineering, physical, and social problems. 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 a human circulatory system. A systems scientist is concerned with understanding the entire system, including its internal structure and its interactions with external variables. Generally, inputs to the system and outputs from the system are observed and used to develop or confirm dynamical models for the system. With these models, rational decision-making procedures are established and decisions are implemented to achieve prescribed system objectives. Therefore, a systems scientist is a generalist, well versed in mathematics and the sciences, who works in industry or government solving complex interdisciplinary problems. The systems scientist is usually the member of a team who integrates the specialized knowledge of the other members; however, work can be done alone on mathematical aspects of abstract problems.

Engineering Sciences is concerned with the application of the pure sciences to engineering problems. Because of the flexibility of this program, students may develop programs especially designed to meet the goals of their undergraduate engineering education. Thus, students can take courses which prepare them for careers in bioengineering, civil engineering, mechanical engineering, or systems science; or they may develop a sequence of courses emerging from current research interests of the faculty of AMES and other departments, e.g., sequences in the earth sciences, transportation, and energy-related studies. Therefore, depending on the interests of the student, courses may be elected which prepare graduates for careers in aerospace, construction, health-related, environmental, or other industries.

Chemical Engineering is one of the classic engineering fields and involves the application of the pure and engineering sciences on an industrial scale to the chemical modification of materials in order to produce other materials. Examples of such applications are in the petroleum, food, polymer, environmental control, and pharmaceutical industries.

UPPER-DIVISION MAJOR IN APPLIED SCIENCE

The applied science curricula provide training for students in the subjects which are at the foundations of bioengineering; aerospace, civil, or mechanical engineering; and systems science. Because the courses in the major are confined to the upper-division, this program is designed to accommodate those who do not wish to specialize at an earlier stage and gives students adequate opportunity to meet their collegiate requirements. However, properly qualified lower-division students may elect certain courses in AMES' upper-division programs and may be admitted to an AMES major upon approval by the appropriate AMES faculty adviser. There are three distinct options within the applied science program: applied mechanics, bioengineering, and systems science.

Program Preparation

All students who expect to major in one of these options are strongly advised to prepare themselves beforehand in each of five areas: mathematics, computer programming, physics, chemistry, biology. Normal preparation for the applied science program is summarized below. (Students choosing the bioengineering option or enrolled in Revelle College also should take Biology 1 at some time during this two-year period.)

STUDENTS ENTERING WITHOUT ADVANCED STANDING IN MATHEMATICS (i.e., NO PREVIOUS CALCULUS)

FALL	WINTER	SPRING
Freshman Year		
Math. 2A AMES10 ¹	Math. 2B Phys. 2A Phys. 2AL	Math. 2C Phys. 2B Phys. 2BL
Sophomore Year		
Math. 2DA Phys. 2C Phys. 2CL	Math. 2EA Chem. 6A ² Chem. 8AL	Chem. 6B ² Chem. 8BL

STUDENTS ENTERING WITH CREDIT FOR THE EQUIVALENT OF MATHEMATICS 2A

FALL	WINTER	SPRING
Freshman Year		
Math. 2B Phys. 2A ³ Phys. 2AL	Math. 2C Phys. 2B ³ Phys. 2BL	Math. 2DA Phys. 2C ³ Phys. 2CL
Sophomore Year		
Math. 2EA AMES 10 ¹	Chem. 6A ² Chem. 8AL	Chem. 6B ² Chem. 8BL

¹AMES 10 is the normal way to attain digital computer programming competence, but the student may offer equivalent competence obtained in some other way

²Chem. 6A B may be replaced by Chem. 7A B

³In this case, Phys. 2A B C may be replaced by Phys. 3A B C

Lack of proper prerequisites could mean that more than six quarters of residence would be needed to satisfy the major program requirements. Students having special problems with regard to prerequisites should consult with an AMES faculty adviser as soon as possible.

Students anticipating enrollment in the AMES upper-division major and wishing to strengthen their preparation in the engineering sciences relevant for such a major should take AMES 16 in their sophomore year.

Third College students planning to take an AMES upper-division major should consult with the AMES adviser in Third College as soon as possible after enrolling at UC San Diego. Prerequisite courses are assigned on an individual basis by the AMES/Third College adviser.

Degree Requirements

As a minimum graduation requirement, a student qualifying for a major in AMES must pass eighteen upper-division courses. Normally, fifteen of these courses must be in the AMES department (or in biology or chemistry in the case of bioengineering). The requirement of fifteen AMES courses is satisfied by the required courses designated in each option. (Systems science majors may count AMES 17 as one required course.) The remaining courses in these options are chosen from electives that may be selected either from the list of approved technical electives or in other areas selected in consultation with the AMES faculty adviser. (Biology 195, AMES 195, 198, and 199 courses are not allowed as technical electives in meeting the eighteen-course requirement.) Students with superior records are encouraged to take courses beyond the minimum number, including graduate courses, with special emphasis on the offerings of the Departments of Electrical Engineering and Computer Sciences, Biology, Chemistry, Mathematics, Physics, and Economics. Advisers should be consulted on suitable courses.

Transfer students who have taken equivalent courses elsewhere may have transfer credit approved towards the minimum graduation requirement, but they must pass at least six upper-division or graduate courses (each graduate course having three or more quarter units) in AMES. More than six AMES courses may be required of transfer students at the discretion of the AMES faculty adviser.

Applied Mechanics Option

The applied mechanics curriculum stresses the areas of solid and fluid mechanics and dynamics with application to the engineering fields based on mechanics, such as aerospace, civil, and mechanical engineering. Courses for students following this option include fluid dynamics, solid mechanics and structures, particle and rigid-body dynamics, thermodynamics, linear systems analysis, and problem solving methodology in applied mechanics.

Applied Mechanics

FALL	WINTER	SPRING
Junior Year		
AMES 105A ¹	AMES 105B	AMES 110
AMES 130A	AMES 130B	AMES 121A
AMES 142A	AMES 163A	
Senior Year		
AMES 101A	AMES 101B	AMES 101C ² or
AMES 121B ²	AMES 150	AMES 130C ² or
AMES 175A	AMES 175B	AMES 132 ²
Technical Electives		
AMES 111	AMES 102	AMES 101C
		AMES 105C
		AMES 130C
AMES 141A	AMES 141B	AMES 132
		AMES 141C
AMES 162A	AMES 162B	AMES 142B
		AMES 162C
	AMES 173	AMES 163B
		AMES 172
AMES 180A	AMES 180B	AMES 175C
Chem. 130	Chem. 131	AMES180C
EECS 131A	EECS 131B	Chem. 132
	EECS 133	EECS 131C
	FS 119B	FS 119C
Math. 131	Math. 132A	Math. 132B
Math. 170A	Math. 170B	Math. 170C
Math. 180A	Math. 180B	Math. 180C
	Math. 181A	Math. 181B
Phys 100A	Phys. 100B	Phys. 100C
Phys. 116		
Phys. 130A	Phys. 130B	Phys. 130C

¹Math. 2DA must be taken prior to enrollment in AMES 105A, also Math. 2EA must be taken during fall quarter of the junior year if not already completed by the end of the sophomore year.

²Normally, a student is required to take AMES 121B in addition to one of the following: AMES 101C, 130C, or 132 (130C or 132 may be taken in the spring quarter of either the junior or senior year). However, a student may petition to replace any of these courses by alternative courses with approval of the AMES faculty adviser.

Bioengineering Option

The bioengineering curricula prepare the student either for the engineering aspects of medical care and research or for professional training in medical school. Accordingly, there are two tracks: a premedical program and an engineering program. The former meets the entrance requirement of most American medical schools and also is suitable for a student planning to enter graduate school in bioengineering, physiology, or neurosciences; the latter is planned for a

broad basic training which includes courses in applied mathematics, mechanics with applications to biology, physiology, electronics, and chemistry.

Bioengineering: Engineering

FALL	WINTER	SPRING
Junior Year		
AMES 100	AMES 173	AMES 172
AMES 105A ¹	AMES 105B	AMES 121A
Chem. 128 ²	AMES 163A	AMES 163B
Senior Year		
Biol. 151	Biol. 153	
AMES 142A		
AMES 175A		AMES 175C
AMES 180A	AMES 180B	AMES 180C
Technical Electives		
AMES 101A	AMES 101B	AMES 110
		AMES 101C
		105C
	271B	271C
Biol. 101-or-	Biol. 101-or-	Biol. 101
Biol. 133		Biol. 156
Chem. 130	Chem. 131	Chem. 132
Chem. 140A	Chem. 140B	
EECS 146A(AL)	EECS 146B(BL)	EECS 146C(CL)
Math. 170A-or-	EECS 166	

¹Math. 2DA must be taken prior to enrollment in AMES 105A, also, Math. 2EA must be taken during fall quarter of the junior year if not already completed by the end of the sophomore year.

²Chem. 128 may be replaced by Chem. 131 (W).

Bioengineering: Premedical

FALL	WINTER	SPRING
Junior Year		
105A ¹	105B	
Biol. 101	Biol. 131	Biol. 156
Chem. 140A	Chem. 140B	
Chem. 143A		
Senior Year		
AMES 100	AMES 173	AMES 172
AMES 175A		AMES 175C
Biol. 151	Biol. 153	
Technical Electives		
AMES 101A	AMES 101B	AMES 101C
		AMES 105C
AMES 142A		AMES 142B
AMES 180A	AMES 180B	AMES 180C
Biol. 101-or-	Biol. 101-or-	Biol. 101
	Biol. 102	
Chem. 130	Chem. 131	Chem. 132
Phys. 100A	Phys. 100B	Phys. 100C

¹Math. 2DA must be taken prior to enrollment in AMES 105A, also, Math. 2EA must be taken during fall quarter of the junior year if not already completed by the end of the sophomore year.

Systems Science Option

This program is designed to familiarize students with the methodologies of system modeling, identification, and control. Basic to these concerns is the study of a wide variety of applied mathematics, and emphasis is placed on the study of linear systems, probability and random processes, optimization theory, and numerical and computational methods.

Because of the similarity of the two programs, an AMES/EECS double major in the systems science option is not permissible for AMES students. Any other

AMES

AMES/EECS double majors require six additional AMES (or AMES/EECS) courses that are not offered in satisfaction of requirements for any non-AMES majors.

Systems Science

FALL	WINTER	SPRING
Junior Year		
AMES 105A ²	AMES 17 ⁵	AMES 121A ¹
AMES 142A	AMES 105B	
	AMES 163A	AMES 163B
Senior Year		
AMES 141A	AMES 141B	AMES 141C
AMES 162A	AMES 162B	AMES 162C
AMES 175A	AMES 175E	
Technical Electives³		
AMES 101A	AMES 101B	AMES 110
AMES 121B ⁴		AMES 101C
AMES 130A	AMES 130B	AMES 105C
	AMES 150	AMES 130C
	AMES 146B	AMES 142B
AMES 146A	Econ. 172B	AMES 146C
Econ. 172A	EECS 146B(BL)	Econ. 172C
EECS 146A(AL)	EECS 152B	EECS 146C(CL)
EECS 152A	EECS 154B	EECS 152C
EECS 154A	EECS 159B	EECS 154C
EECS 159A	EECS 166	EECS 159C
	EECS 160B	
EECS 160A	FS 119B	FS 119C
Math. 131	Math. 171A	Math. 171B
Math. 170A	Math. 170B	Math. 170C

¹Students may petition to replace AMES 121A by an alternative course with approval of the AMES faculty adviser.

²Math. 2DA must be taken prior to enrollment in AMES 105A also. Math. 2EA must be taken during fall quarter of the junior year if not already completed by the end of the sophomore year.

³No more than one of the sequences AMES 146A-B-C, Econ. 172A-B-C and Math. 171A-B may be used as electives, nor may EECS 166 be used in addition to Math. 170A-B-C.

⁴AMES 121B is not required for the systems science program, but is a strongly recommended elective.

⁵AMES 17 will be offered in spring quarter during 1980-1981.

FOUR-YEAR MAJOR IN ENGINEERING

The engineering curricula correspond to a more traditional engineering education. There are sufficient electives so that students may satisfy the general education requirements of their college and the requirements of any department in which a minor is being pursued, but the number of prescribed or technical elective courses is greater in the engineering curricula than in the applied science curricula.

Degree Requirements

The engineering program involves three essential components: nine quarter-courses are reserved for electives and should be used by students to fulfill their collegiate and/or minor requirements. The second component involves a sequence of courses in the pure, applied, and engineering sciences. The final component consists of technical courses leading to specialization in either

engineering sciences or chemical engineering.

In the first two years, both engineering programs provide the student with the basic courses in mathematics and the pure sciences, with an introduction to the use of the computer, and with introductory courses in mechanics and thermodynamics. In addition, six elective courses should be taken to meet collegiate or minor requirements. In the upper division, the programs allow for three additional elective courses, and prescribe a course in linear systems, courses in the application of computing to engineering problems, and a sequence in experimental techniques.

Engineering Science Program

Students undertaking the engineering sciences specialization may select their technical electives from courses offered by AMES and other science departments. The purpose of this flexibility is to permit students to develop programs especially designed to meet the goals of their undergraduate engineering education. Thus, students may elect courses which prepare them for careers in bioengineering; civil or mechanical engineering; or systems science. They may develop a sequence of courses emerging from the current research interests of the faculty of AMES and other departments, e.g., sequences in the earth sciences, in transportation, and in energy-related studies. Students intending to do postgraduate professional work in non-technical fields such as business administration, law, or medicine may develop an appropriate sequence of courses. Clearly, students should consult their advisers to develop a sound course of study to fulfill the requirements of this component of the program.

Engineering Sciences

STUDENTS ENTERING WITHOUT ADVANCED STANDING IN MATHEMATICS (i.e., NO PREVIOUS CALCULUS)

FALL	WINTER	SPRING
Freshman Year		
Math. 2A	Math. 2B	Math. 2C
AMES 10	Phys. 2A	Phys. 2B
	Phys. 2AL	Phys. 2BL
E ¹	E	E
Sophomore Year		
Math. 2DA	Math. 2EA	Math. 80A
Phys. 2C	Chem. 6A ²	Chem. 6B ²
Phys. 2CL	Chem. 8AL	Chem. 8BL
AMES 11 ³	AMES 17 ⁴	AMES 110
E	E	E

STUDENTS ENTERING WITH CREDIT FOR THE EQUIVALENT OF MATHEMATICS 2A

FALL	WINTER	SPRING
Freshman Year		
Math. 2B	Math. 2C	Math. 2DA
Phys. 2A ⁵	Phys. 2B ⁵	Phys. 2C ⁵
Phys. 2AL	Phys. 2BL	Phys. 2CL
E ¹	E	E
Sophomore Year		
Math. 2EA		Math. 80A
AMES 10	Chem. 6A ²	Chem. 6B ²
AMES 11 ³	Chem. 8AL	Chem. 8BL
	AMES 17 ⁴	AMES 110
E	E	E

UPPER DIVISION (ALL STUDENTS)

Junior Year		
AMES 105A	AMES 105B	TE ⁶
AMES 130A	AMES 130B	AMES 130C ⁷ or- AMES 132 ⁷
AMES 142A	AMES 163A	TE
E	E	E
Senior Year		
175A	175B	TE
101A	101B	101C ⁷
TE	AMES 150	AMES 142B
TE	TE	TE

¹Elective courses necessary to satisfy general-education and/or minor requirements.

²Chem. 6A-B may be replaced by Chem. 7A-B.

³AMES 11 will be offered in winter quarter during 1980-1981.

⁴AMES 17 will be offered in spring quarter during 1980-1981.

⁵In this case, Phys. 2A-B-C may be replaced by Phys. 3A-B-C.

⁶Technical electives taken during the junior and senior years must be upper division or graduate courses in the engineering sciences, natural sciences, or mathematics, selected with the approval of the AMES faculty adviser.

⁷Students may petition to replace AMES 101C, 130C, or 132 by alternative courses with approval of the AMES faculty adviser.

Chemical Engineering Program

Students undertaking the chemical engineering program of study have only a few free technical electives. The required technical courses in this specialization include organic and physical chemistry, fluid mechanics, heat and mass transfer, and professional courses associated with unit and plant design.

Chemical Engineering

(STUDENTS ENTERING WITH ADVANCED STANDING IN MATHEMATICS MAY BEGIN THEIR MATHEMATICS SEQUENCE WITH MATH 2B.)

FALL	WINTER	SPRING
Freshman Year		
Math. 2A	Math. 2B	Math. 2C
Chem. 6A	Chem. 6B	Chem. 6C
Chem. 8AL	Chem. 8BL	Phys. 2B
AMES 10	Phys. 2A	Phys. 2BL
E ¹	E	E
Sophomore Year		
Math. 2DA	Math. 2EA	Math. 80A
Chem. 141A	Chem. 141B	Chem. 143A
Phys. 2C	AMES 17 ²	AMES 110
E	E	E

Junior Year		
Chem. 130	Chem. 131	Chem. 132
AMES 142A	AMES 163A	Chem. 105A
AMES 101A	AMES 101B	AMES 101C
E	E	E
Senior Year		
AMES 175A	AMES 175B	AMES 175D
AMES 112	AMES 113	AMES 114
AMES 130A	AMES 130B	TE ³
TE	TE	TE

¹Elective courses necessary to satisfy general education and/or minor requirements.

²AMES 17 will be offered in spring quarter during 1980-1981.

³Technical electives must be upper-division or graduate courses in the engineering sciences, natural sciences, or mathematics, selected with the approval of the AMES faculty adviser.

General Information for AMES Undergraduate Students

Advisers 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 AMES administrative offices. These advisers usually remain with the same set of students during their undergraduate careers at UC San Diego. Students must meet with their faculty adviser to design a study plan as soon as AMES has been designated as a major. This plan may be revised in subsequent years, but such a revision must be approved by the faculty adviser. An Individual Program Form must be signed by the adviser and kept up-to-date.

Program Alterations More flexible undergraduate programs can be arranged, but variations from any program requirements require a petition approved by the AMES faculty adviser and the AMES department chairman. Petition forms may be obtained from AMES' student affairs secretary and must be processed through her office.

Transfer Students Graduates of junior colleges may enter either the applied science or engineering program in their junior year. Transfer students should be mindful when planning their program of the lower-division course requirements for meeting their collegiate and major requirements.

Grade-Point Requirement In addition to an overall grade-point average of at least 2.0, the department requires that AMES students must maintain at least a C grade in each required course in the undergraduate programs as a minimum graduation requirement.

Independent Study AMES students may take AMES 199, Independent Study for Undergraduates, as an elective course under the guidance of an AMES faculty member. Students may propose to a faculty member a research or study

topic or may avail themselves of the list of suitable topics issued by the department each fall quarter. After obtaining the faculty member's concurrence on the topic and scope of the study, the student must execute an authorization form available from the provost's office. Such courses may not be used to satisfy the minimum eighteen-course requirement for the major.

Fifth-Year M.S. Degree AMES undergraduates with suitable academic standing are encouraged to plan their academic programs to provide for a fifth year of study leading to an M.S. degree. For students matriculating in the applied science program, the M.S. degree should be considered a first professional degree. In some cases, AMES students may be able to take several first-year graduate courses during their senior year. AMES faculty advisers are able to advise students in this regard.

Other Undergraduate Programs of Study in AMES

Minors AMES offers several minors for Warren College students. In collaboration with the Department of Physics, a minor for nonscience students entitled Scientific Perspectives is offered. In addition, for students in the social sciences and in the pure and applied sciences, minors in applied mechanics and systems science are available. Undergraduate students wishing to arrange a sequence of AMES courses to satisfy minor requirements or to meet particular academic interests are urged to consult the AMES chairman for referral to the appropriate AMES faculty member.

Engineering Physics Program In addition to the major and minor programs offered by the department, AMES also participates in the engineering physics program which is jointly offered by the Departments of AMES, EECS, and Physics and is administered by the Department of EECS. See "Engineering Physics Program" under EECS for details.

The Graduate Program

Admission is in accordance with the general requirements of the graduate division. Candidates with bachelor's or master's degrees in mathematics, the physical sciences, or any branch of engineering are invited to apply. The department strongly recommends that all applicants submit scores from the Graduate Record Examination. This is essential if they seek financial aid.

While students are welcomed 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 department's Graduate Admissions Committee.

The Department of Applied Mechanics and Engineering Sciences offers graduate instruction leading to the M.S. and Ph.D. degrees in engineering sciences with specialization in each of applied mechanics, bioengineering, engineering physics, and systems science.

A number of AMES faculty participate in a program in applied ocean sciences conducted jointly with some faculty in the Scripps Institution of Oceanography and Department of Electrical Engineering and Computer Sciences. AMES students in this program receive the Ph.D. with specialization in engineering physics upon completion of normal departmental requirements. Plans to formalize the program and to establish within AMES M.S. and Ph.D. degrees in engineering sciences (applied ocean sciences) are now in progress. Students who contemplate work in applied ocean sciences are advised to take courses in physical science and mathematics and to seek admission into some of the Scripps core courses, such as 210A (Physical Oceanography), 240 (Marine Chemistry), and 270A (Biological Oceanography).

Bioengineering students who intend to obtain the M.S. and/or the Ph.D. degree in bioengineering are required to take the bioengineering core graduate courses, AMES 271A-B-C and AMES 272, 273, 278 and pass with a grade of B or better.

A new graduate student who does not meet the prerequisites of those 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 AMES 105A-B, 100, 172, 173 in the first year and AMES 272, 273, 278 in the second year. A student deficient in biology and chemistry may have to take Chemistry 128 or 131 and Biology 151, 153 in the first year and AMES 217A-B-C in the second year.

The instructional and research programs are characterized by strong interdisciplinary relationships with the Departments of Electrical Engineering and Computer Sciences, Economics, Mathematics, Physics, and Chemistry, and with associated campus institutes such as the Institute for Pure and Applied Physical

Sciences and the Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, UC San Diego Energy Center, and the School of Medicine.

MASTER'S DEGREE PROGRAM

The department offers the M.S. degree 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.

Students with baccalaureate degrees may wish to round out their professional training by taking a fifth year of study and by considering the M.S. degree as terminal. Other students may obtain the M.S. degree on the way toward the doctorate.

Students who are admitted for a master's degree only and subsequently wish to continue towards a Ph.D., must be reevaluated by the department's graduate admissions committee before the departmental Ph.D. qualifying examination may be taken.

Course requirements are left flexible in order to permit students and their advisers to develop the most beneficial programs. (Bioengineering students have specific core course requirements; see above for details.) The department accepts a maximum of four units of extension courses at the 100 level towards the M.S. degree provided that (a) approval of the Graduate Council and the student's adviser is obtained and (b) the courses have either an exact counterpart in AMES or else are approved by faculty members in AMES who have professional competence in the particular field. Specific departmental requirements for the M.S. degree are as follows:

1. A course of study must include thirty-six units of credit and must be approved by the student's adviser. Credit must be obtained for at least twelve quarter-units of AMES 200-level courses, not including AMES 206, 281, or 299. Students studying under Plan I also must obtain credit for exactly six units of AMES 299 (research). Students studying under Plan II may not apply AMES 299-units toward the M.S. degree. No more than twelve units of upper-division, 100-level courses may be taken for the M.S. degree.

2. Students must have an average of B or higher in the courses taken to fulfill requirements for the M.S. degree.
3. The thesis under Plan I is reviewed by a thesis adviser and two other faculty members appointed by the dean of Graduate Studies. The review is normally an oral defense of the thesis.
4. The comprehensive examination under Plan II is conducted by the adviser and at least two other faculty members. The examination committee normally conducts an oral or written examination in the candidate's discipline 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.

Successful candidates receive the M.S. degree in engineering sciences with a designated specialization in applied mechanics, engineering physics, bioengineering, or systems science.

DOCTORAL DEGREE PROGRAM

The AMES Ph.D. program is intended to prepare students for a variety of careers in research and teaching. Therefore, research is initiated as soon as possible, commensurate with the student's background and ability. There are no formal course requirements for the Ph.D. (Bioengineering students do have specific core course requirements; see above for details.) However, most students, in consultation with their advisers, develop course programs that will prepare them for the AMES departmental examination and for their dissertation research.

A departmental examination is given to each Ph.D. candidate prior to his or her formal Ph.D. qualifying examination. This departmental examination normally is taken after the completion of three quarters of full-time graduate work and seeks to examine the student's academic and research ability. It is administered by a committee which includes at least four AMES faculty members, appointed by the department chairman on the basis of nominations made by the student's adviser. To insure breadth, each student must specify four areas of specialization, with each area defined as the subject material taught in a specified group of three or more related graduate courses. Proficiency in one area may be satisfied by grades of A or B in the courses. The

departmental examination must include at least three areas, with at least two of the areas being defined by AMES graduate courses. The same AMES course cannot be used in the definition of more than one AMES area. Subject material covered in AMES 281, 296, 297, 298, or 299 courses is not considered acceptable for the satisfaction of the AMES area requirement.

After satisfactory completion of the departmental examination, a graduate student in AMES must pass the formal Ph.D. qualifying examination administered by the student's doctoral committee. (See "Graduate Studies: the Ph.D.")

There is no formal foreign-language requirement for doctoral candidates. Students are expected to master whatever language is needed for the pursuit of their own research.

Departmental policy requires all Ph.D. students to spend a minimum of three consecutive quarters as a "full-time student" in AMES following completion of the departmental qualifying examination. Full-time employment outside the department is not consistent with the department's interpretation of full-time student. A Ph.D. thesis should represent research actually performed at UC San Diego and may not be acceptable if any significant portion has been printed or listed elsewhere as an industrial report. Further details on these policies may be obtained from the department.

Successful candidates are awarded the Ph.D. degree in engineering sciences, with one of the special fields — bioengineering, engineering physics, applied mechanics, or systems science — designated.

Candidate in Philosophy Degree

AMES Ph.D. students who have passed their Ph.D. qualifying examinations and have advanced to candidacy are awarded the Graduate in Philosophy degree. (See "Graduate Studies: Candidate in Philosophy Degree.")

Courses

Lower Division

10. FORTRAN Programming (4)

Essentials of FORTRAN programming with application to solving problems in mathematics, engineering, and science. Introduction to various computer job input/output facilities at UC San Diego. Use of batch and interactive processing. Structured programming. (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: Phys. 2A-B or Phys. 3A-B and Math. 2A-B-C.* (F) (Offered in winter quarter during 1980-1981 only.)

16. Introduction to Engineering Mechanics (4)

Statics of particles and rigid bodies, forces in beams, cable structures, submerged structures and machine elements. Analysis of truss structures in two and three dimensions. Friction. Applications to engineering problems. *Prerequisites: Phys. 2A or Phys. 3A and Math. 2EA (or concurrent registration).* (S)

17. Engineering Dynamics (4)

Kinematics and dynamics of particles, systems of particles and rigid bodies including motion relative to noninertial frames. Conservation laws for linear and angular momentum and for energy. Elements of mechanical vibrations. *Prerequisites: Phys. 2A-B or Phys. 3A-B and Math. 2DA.* (W)

33. Management of the Air Environment (4)

Definition of problems involving man's alteration of the chemistry of the atmosphere, relative contributions of man and of natural inputs, health effects and research needed. Structure and uses of air-pollution models. Air-pollution control decision making and the role of the citizen. (F)

34. Energy: Demands, Resources, Technology, and Policy (4)

A survey course on energy stressing the following topics: the manner in which our energy demands are defined at the local, regional, national, and international levels; the total (currently used and potential) resources available for satisfying energy demands; highlights of technological challenges concerning new energy production and utilization techniques. Energy policy, with emphasis on potential environment and economic impacts. (S)

35. Society and the Sea (4)

Introduction to the oceans and their relationship to man. Selected topics include living and nonliving resources, sea-ports, and sea travel; legal, economic, military, and social aspects; coastal zone management, scientific research, and the sea and weather. (W)

90. Freshman Seminar (0)

Freshman seminars organized around the research interests of various faculty members. *Prerequisites: freshman standing and consent of instructor.* (F,W,S)

Upper Division

100. 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. Four hours' lecture. *Prerequisites: Phys. 2A-B-C or Phys. 3A-B-C and AMES 105A (or concurrent registration).* (F)

101A-B-C. Fluid Mechanics (4-4-4)

Hydrostatics with application to submerged surfaces and structure of atmospheres. Bernoulli's equation, its extension and application. Elements of viscous, heat conducting flows. Integral momentum and energy theorems, similitude and dimensional analysis. Potential flow, boundary layers, compressible flow including shock waves, generalized one-dimensional flow. Calculation of transport coefficients for momentum, heat, and mass transfer, laminar and turbulent flow. *Prerequisites: Math. 2DA and AMES 110 (or concurrent registration).* (F,W,S)

102. Mechanical Behavior of Materials (4)

Mechanical tests, elasticity and anelasticity, dislocations and microplasticity of crystals, plastic deformation and creep, fracture and strengthening mechanisms, ceramics and other inorganic nonmetallics, polymers. Laboratory demonstrations of selected topics. *Prerequisites: Math. 2A-B-C, Phys. 2A-B-C or Phys. 3A-B-C, and Chem. 6A-B or Chem. 7A-B, or consent of instructor.* (W)

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 EECS 105A-B-C.) *Prerequisites: Math. 2DA and Phys. 2A-B or Phys. 3A-B (Math. 2D is not an adequate substitute for Math. 2DA.)* (F,W,S)

110. Thermodynamics (4)

First and second laws and selected applications, e.g., thermo-chemistry, heat capacities and heats of reaction, engine cycles, etc. *Prerequisites: Chem. 6A or 7A and Chem. 8AL.* (S)

111. Thermodynamics II (4)

Introduction to statistical mechanics and statistical thermodynamics. The most probable distribution and maximum entropy for systems in equilibrium. Bose-Einstein, Fermi-Dirac, and Boltzmann statistics. Definition of partition function and its relationship to various thermodynamic quantities. Examples of applications. *Prerequisite: AMES 110.* (F)

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: Chem. 132 and AMES 101C or consent of instructor.* (F)

113. Chemical Reactor Engineering (4)

Principles of analysis and design of chemical reactors. Treatment of kinetic data, analysis of simple batch and continuous reactors, nonisothermal effects, mixing effects. Primarily homogeneous reactions, but some introduction to catalysis and the role of mass transfer in heterogeneous kinetics. *Prerequisites: Chem. 132 and AMES 101C or consent of instructor.* (W)

114. Design of Chemical Engineering Systems (4)

Engineering and economic analysis of integrated chemical processes, equipment, and systems. Cost estimation, heat and mass transfer equipment design and costs, materials, selection, optimum designs, major design project. *Prerequisite: senior standing in the chemical engineering program or consent of instructor.* (S)

121A. Dynamics I (4)

Kinematics of particles and rigid bodies; acceleration in noninertial frames; particle dynamics. Conservation laws for energy and momentum. Generalized coordinates, virtual work, and Lagrange's equations. Introduction to dynamics of rigid bodies. Solution of problems oriented toward engineering. *Prerequisites: Math. 2DA and Phys. 2A-B or Phys. 3A-B.* (S)

121B. Dynamics II (4)

Linear vibrations of one, two, and matrix-formulated, multidegree of freedom systems. Vibration and wave motion of continua. Applications, oriented to engineering problems, of Newtonian and Lagrangean methods for derivation of equations and of modal representation and Laplace transform techniques. Introduction to nonlinearity and damping. *Prerequisite: AMES 121A.* (F)

130A. Solid Mechanics I (4)

Equilibrium of particles and rigid bodies. Statically determined trusses. Elasticity and strain in one-dimensional tension and compression. Statically indeterminate problems. One-dimensional visco-elasticity and plasticity. Plastic limit design. Pressure vessels. Torsion or circular shafts. Stresses and deflections in beams. Limit design of beams. Four hours' lecture, coordinated experiments and demonstrations. *Prerequisites: Math. 2DA and Math. 2EA and Phys. 2A-B-C or Phys. 3A-B-C.* (F)

130B. Solid Mechanics II (4)

Two-dimensional stress and strain. Transformation laws, field equations, and constitutive relations. Exact solutions for simple beam problems. Polar coordinate problems. Extremum principles. St. Venant torsion theory. Three-dimensional stress and strain. Four hours' lecture. *Prerequisite: AMES 130A.* (W)

130C. Solid Mechanics III (4)

Linear and nonlinear one-dimensional theory of beams. Symmetric bending of circular plates and shells. Small deflections of plates. Solutions for small deflections of rectangular plates. Four hours' lecture. *Prerequisite: AMES 130B.* (S)

132. Structural Analysis (4)

Principles of matrix analysis of elastic truss and frame structures. Introductory treatment of finite element analysis of structures and use of general purpose, finite element structural analysis computer programs. Four hours' lecture. *Prerequisites: Math. 2EA and AMES 130A-B.* (S)

141A. Linear Control System Theory (4)

Linear continuous feedback control systems, emphasizing frequency-domain and Laplace transform methods. Sinusoidal-input and transient response. Error constants. Stability. Routh-Hurwitz test. Root-locus. Bode, and Nyquist plots. Computer solution of typical systems problems. *Prerequisite: AMES 163B.* (F)

141B. Linear Control System Theory (4)

Extension of 141A. Emphasis on time-domain methods of analysis and synthesis. Use of state-variable feedback in system design. The resolvent and state-transition matrices. Controllability and observability. The Z-transform and its application to analysis of sampled-data systems. *Prerequisite: AMES 141A.* (W)

141C. Problems in System Synthesis (4)

Translation of task requirements into practical system models. Consideration of such problems as stability of continuous and sampled systems, word length and sampling rate of digital controller, accuracy, disturbance immunity, and human factors requirements. Application of above concepts to a real project of current interest in engineering practice. *Prerequisite: AMES 141B.* (S)

142A. Computer Methods in Engineering Science (4)

Review of FORTRAN programming, principles and practice of program construction at various levels of complexity, use of library programs, application to illustrate both engineering problems and numerical techniques. *Prerequisite: AMES 10 or equivalent knowledge of FORTRAN.* (F)

142B. Computer Methods in Engineering Science (4)

Analysis of physical systems leading to ordinary and partial differential equations, with their digital-computer solutions. The physical context is the dynamics of discrete and continuous electrical and mechanical systems. *Prerequisite: AMES 142A.* (S)

146A-B-C. Introduction to Optimization (4-4-4)

Linear and nonlinear programming, Kuhn-Tucker conditions, simplex method, search procedures for unconstrained and constrained minimization, dynamic programming, principle of optimality, performance measures, calculus of variations, Euler-Lagrange equations, Pontryagin maximum principle, linear optimal control problems, bang-bang control, linear-quadratic controller, two-point boundary value problems. (F,W,S)

150. Topics in Applied Mechanics (4)

Preparation of engineering reports on series of applied problems illustrating methodology from various branches of applied mechanics, e.g., heat transfer, fluid flow, structural analysis and vibrations. *Prerequisites: AMES 10, AMES 101A, AMES 105A-B, AMES 110, AMES 121A, AMES 130A-B, or consent of instructor.* (W)

162A-B-C. Statistical Communication Theory (4-4-4)

Review of probability theory, combinatorial analysis, generating functions, random variables, distributions, expectations, limit theorems. Stochastic processes, correlation functions, spectral densities, the Gaussian process, orthonormal expansions, meansquare filtering. Elements of information theory, entropy, mutual information, channel capacity, coding. *Prerequisite: AMES 163B.* (F,W,S)

163A. Linear Circuits (4)

Lumped circuits, Kirchhoff's laws, circuit elements, first and second order circuits, steady state sinusoidal response, computational topics. *Prerequisites: Math. 2DA, AMES 105A, AMES 142A.* (W)

163B. Linear Systems (4)

Network graphs, node and mesh analysis, loop and cutset analysis, state equations, natural frequencies, network theorems, two ports, computational topics. *Prerequisites: Math. 2EA, AMES 163A.* (S)

170. AMES Laboratory (0)

Introduction to apparatus design and fabrication. Instruction includes practical operation of machine tools and measuring instruments. Strength of materials and their machinability are considered. *Prerequisite: consent of instructor.* (F,S)

172. Biomechanics (4)

Application of mechanics to biological systems. Basic mechanical properties of living tissues such as the blood, mucus, blood vessels, tendons, skin, muscles, bone cartilage. Mechanics of organs such as the heart, the lung, the arteries. Fluid and solid mechanics of flying, swimming, and locomotion. *Prerequisite: AMES 100.* (S)

173. Bioengineering: Transport Phenomena (4)

Transport phenomena in biological systems treated from the viewpoint of statistical mechanics and fluid dynamics. Diffusion through biological structures. The mechanisms of transport in the cardiovascular system. Porous media. The osmotic effect. Suitable for students in biology interested in engineering analysis of biological systems. *Prerequisite* AMES 100 (W)

175A. Experimental Techniques I (4)

Principles and practice of measurement and control, and of the design and conduct of experiments. Lectures relate to dimensional analysis, error analysis, signal-to-noise problems, filtering, data acquisition and data reduction, as well as background of experiments. Experiments relate to the use of electronic devices and sensors. *Prerequisite* senior standing (F)

175B. Experimental Techniques II (4)

Continuation of AMES 175A, with lectures and additional experiments which relate to electronic devices and to a selection of experiments having direct application of such devices for measurements in applied mechanics, bioengineering, and systems science. *Prerequisite* AMES 175A (W)

175C. Experimental Techniques III (4)

A course designed to demonstrate basic concepts of the bioengineering curriculum through experimental procedures. Experiments include: nerve action, electrocardiography, mechanics of muscle, membranes and noninvasive diagnostics in man. *Prerequisites* senior standing, AMES 175A (S)

175D. Experimental Techniques IV (4)

Experiments in momentum, heat, and mass transfer, including chemical reactors, relevant to chemical engineering processes. Examples are internal and external flow heat exchangers; flow through fixed and fluidized beds; boiling heat transfer, gas-liquid absorption and evaporation; heterogeneous and homogeneous reactors, batch and flow. Laboratory reports will include application of data to design of large-scale industrial components. *Prerequisites*: AMES 175A-B, AMES 112, and AMES 113. (S)

175E. Microprocessor Control Laboratory (4)

Laboratory/lecture course on the use of microcomputers in the performance of experiments and the interactive control of subsystems. Analog and digital data handling and conversion. Filtering, restoration, and detection of signals. Construction techniques including system design, parts selection, parts ordering, assembly, and performance evaluation. Project utilizing a microprocessor to sense its environment, compute desired changes in that environment, and manipulate the environment to bring about the desired changes. *Prerequisite* systems science senior standing or consent of instructor. (W)

180A. Principles of Bioengineering I (4)

General principles of electronics related to biomedical instrumentation. Basic circuits. Specialized amplifiers. Electrocardiography. Ultrasonic instruments. Electrical safety hazards. *Prerequisite* AMES 163A (F)

180B. Principles of Bioengineering II (4)

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*: AMES 180A and AMES 105A-B during the junior year. (W)

180C. Principles of Bioengineering 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*: AMES 180A B. *Organic and physical chemistry suggested* (S)

195. Teaching (1-4)

Teaching and tutorial assistance in an AMES course under supervision of instructor. Not more than four units may be used to satisfy graduation requirements. (P/NP grades only.) *Prerequisites*: B average in major and permission of department chairman. (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 inter-departmental oral examination.

210A-B-C. Introductory Fluid Mechanics (3-3-3)

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.

211A. Introductory Compressible Flow (3)

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 and AMES 110, or consent of instructor.

211B-C. Mechanics of Propulsion (3-3)

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; performance and optimization; mission analysis. *Prerequisites*: AMES 101A-B, AMES 110, and AMES 211A, or consent of instructor.

220A. Physical Gas Dynamics (3)

Kinetic theory of neutral gases; transport properties, principles and applications of statistical mechanics. *Prerequisites*: AMES 210A-B-C, AMES 105A-B-C, Phys. 140, or consent of instructor.

220B. Physical Gas Dynamics (3)

Principles of electrodynamics and quantum mechanics; theories of atomic and molecular structure; perturbation method in quantum mechanics; semiclassical treatment of radiation; scattering phenomena; transition probabilities; vibrational relaxation; dissociation; ionization, and recombination. *Prerequisites*: AMES 220A, Phys. 130A-B or consent of instructor.

220C. Physical Gas Dynamics (3)

Shock waves and detonation waves, explosions and hypersonic flow; experimental methods in high-temperature gases; shock tubes; atomic and molecular beams; selected topics such as chemical reactions and relaxation processes in turbulent flow, interaction of radiation with ionized gases and gas lasers. *Prerequisite*: AMES 220B or consent of instructor.

221A. Opacity Calculations (3)

Basic laws for radiant-energy emission from gases, liquids, and solids; spectral absorption coefficients, line shapes, curves of growth, theoretical and experimental methods for estimating opacities of uniform and nonuniform gases. *Prerequisite*: consent of instructor.

221B. Radiative Transfer Theory (3)

Fundamental quantities and the equation of transfer; methods of solving radiative transfer problems for gray and non-gray gases, nonstationary problems. *Prerequisite*: AMES 221A or consent of instructor.

222A-B-C. Advanced Fluid Mechanics (3-3-3)

Contemporary problems in broad areas of fluid mechanics, e.g., turbulent flows, hydrodynamic stability, geophysical fluid dynamics, transport phenomena, acoustics, boundary layers, etc. *Prerequisites*: AMES 105A-B-C and AMES 210A-B-C or consent of instructor.

224A-B-C. Reactive Gas Dynamics: Combustion (3-3-3)

This course covers fundamental aspects of flows of reactive gases, with emphasis on processes of combustion, including the relevant thermodynamics, chemical kinetics, fluid mecha-

tics and transport processes. Topics include deflagrations, detonations, diffusion flames, ignition, extinction, and propellant combustion, among others. (S/U grades permitted.) *Prerequisites*: AMES 210A-B-C

226A. Laser Theory and Kinetics (3)

Introduction to laser physics. Principle of light amplification by stimulated emission of radiation. Methods of excitation and inversion generation in solid, liquid, and gaseous media. Oscillators and amplifiers. Optical cavities. Frequency selection and mode control. *Prerequisites*: AMES 220A-B-C or consent of instructor. (S/U grades permitted.)

226B. Laser Theory and Kinetics (3)

Semiclassical treatment of coherent electromagnetic wave propagation in a laser-active medium. Line broadening and gain saturation. Kinetic processes in electrical discharges and in rapidly expanding gas flows. Review of current theories on electrical and gas dynamic lasers. *Prerequisites*: AMES 220A-B-C or consent of instructor. (S/U grades permitted.)

226C. Laser Theory and Kinetics (3)

Chemical kinetics in the gas phase. Vibrational inversion in rearrangement reactions. Chain initiation and chain branching. Premixed and un-premixed chemical systems. Review of current theories and practice on chemical lasers. *Prerequisites*: AMES 220A-B-C or consent of instructor. (S/U grades permitted.)

231A. Foundations of Solid Mechanics (3)

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 (3)

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 (3)

Mechanical models of viscoelastic, plastic, and viscoplastic behavior in simple shear or uniaxial stress. Constitutive laws 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 (3)

Review of matrix analysis and variational principles. Construction of finite elements for plates, shells, and three-dimensional bodies. *Prerequisite*: AMES 231B or consent of instructor.

233A-B-C. Advanced Solid Mechanics (3-3-3)

Contemporary problem areas of research in solid mechanics. Fundamental aspects and recent developments. Examples include finite elasticity, finite plasticity, thermoviscoplasticity, constitutive relations for ductile and brittle solids, static and dynamic fracture processes, contact problems, micropolar continua, mixture theories for composite materials and multiphase systems, asymptotic methods in the theory of plates and shells, complex variable methods in plane elasticity, applications of the calculus of variations to approximate solution techniques and structural optimization. *Prerequisites*: AMES 231A-B-C or consent of instructor.

234. Experimental Mechanics (3)

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 (3-3)

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. *Prerequisite*: AMES 231B or consent of instructor.

236. Structural Stability (3)

Stability analysis of structural elements under steady, oscillatory, and impulsive loadings. Elastic and anelastic stability problems. *Prerequisite*: AMES 235A or consent of instructor.

237. Structural Dynamics (3)

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 (3)

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.

241A-B-C. Linear and Nonlinear Systems (3-3-3)

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:* AMES 141A-B and Math 2EA

246A-B-C. Optimal Control Theory (3-3-3)

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

248A-B. Methods for Time Series Analysis (3-3)

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; spectral representation; power spectrum estimators and their bias and consistency; cross spectral estimators; coherence and multiple coherence. *Prerequisites:* AMES 162A-B-C, AMES 105A-B

262A-B-C. Stochastic Process in Dynamic Systems (3-3-3)

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

264A-B-C. Estimation and System Identification (3-3-3)

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

271A. Structure and Function of Tissue (3)

A general survey will include examples 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. *Prerequisite:* consent of instructor.

271B. Cardiovascular Physiology (3)

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. *Prerequisite:* Biology 129

271C. Respiratory and Renal Physiology (3)

Mechanics of breathing. Gas diffusion. Pulmonary blood flow. Stress distribution. Gas transport by blood. Kinetics of O₂ and CO₂ exchange. V A/Q relations. Control of ventilation. Glomerular and proximal tubule functions. Water metabolism. Control of Na and K in kidney. *Prerequisite:* Chemistry 128

272. Biomechanics and Transport Phenomena (3)

An introduction to biomechanics and transport phenomena in biological systems at the graduate level. Biorheology, bioviscoelastic fluids and solids, muscle mechanics, mass transfer, momentum transfer, energy transfer. The courses 272, 273, 278 form a core sequence in bioengineering. *Prerequisites:* AMES 100, 172, 173 or equivalent

273. Transport Phenomena in Membranes (3)

Nonequilibrium thermodynamic analysis of transport phenomena. The osmotic effect. Diffusion and exchange in biological systems. *Prerequisite:* AMES 272

276. Laboratory Projects in Bioengineering (3)

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 (3)

Structural and functional aspects of transport and blood-tissue exchange in key organs during states such as circulatory shock, bacterial toxemia, hypertension. Also physical and ultrastructural techniques used to analyze small vessel dynamics. *Prerequisite:* consent of instructor

278. Advanced Biomechanics (3)

Modern development of biomechanics at an advanced mathematical level. Treatment of problems of current interest in greater depth. Problems will be selected from circulation, microcirculation, cardiac and pulmonary mechanics, muscle mechanics. *Prerequisites:* AMES 272, 273

279. Selected Topics in Biophysics (3)

Selected topics in biophysics with emphasis on the structure and function of biological membrane, fluid and ion transport, excited states, wave propagation, muscle contraction. *Prerequisites:* AMES 272, 273

280. Techniques in Experimental Cardiovascular Physiology and Microcirculatory Research (2)

Basic cardiorespiratory experimental procedures, application of anesthesia, artificial respiration, dissection of the most frequently used arteries and veins, open-chest preparation, heart and large-vessel exposure, catheterization, long-term implantation, isolated organ perfusion, quantitative evaluation of microvascular phenomena. *Prerequisites:* AMES 271A-B-C. (S/U grades permitted)

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)

294A-B-C. Methods in Applied Mechanics, I, II, III (3-3-3)

Various methods of analysis are covered with emphasis on application. Topics range over the broad fields of complex analysis, ordinary and partial differential equations (linear and nonlinear), asymptotic analysis, integral equations and weighted residuals. Specifics include Dirichlet and Neumann problems, Cauchy concepts, Green functions, Riemann mapping, eigenfunctions, phase-plane analysis, steepest descents, multiple scales, WKB method, matched asymptotic expansions, transform techniques, Fredholm theory, Wiener-Hopf method, Galerkin method. *Prerequisites:* AMES 105A-B-C

296. Independent Study (3)

Prerequisite: consent of instructor

297. Research Techniques (1-6)

A course designed to present the techniques of research through organized lectures, special assignments, and instruction on the techniques of selected research projects. *Prerequisite:* consent of instructor (S/U grades permitted)

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)

BIOCHEMISTRY

OFFICE: 2132 Urey Hall, Revelle College

Professors:

John N. Abelson, Ph.D. (Chemistry)
Warren L. Butler, Ph.D. (Biology)
Marlene A. DeLuca, Ph.D. (Chemistry)
Russell F. Doolittle, Ph.D. (Chemistry)
Richard W. Dutton, Ph.D. (Biology)
Morris E. Friedkin, Ph.D. (Biology)
E. Peter Geiduschek, Ph.D. (Biology)
Murray Goodman, Ph.D. (Chemistry)
Melvin H. Green, Ph.D. (Biology)
Masaki Hayashi, Ph.D. (Biology)
Donald R. Helinski, Ph.D. (Biology)
John J. Holland, Ph.D. (Biology)
Nathan O. Kaplan, Ph.D. (Chemistry)
Joseph Kraut, Ph.D. (Chemistry)
William D. McElroy, Ph.D. (Biology)
Stanley L. Miller, Ph.D. (Chemistry)
Stanley E. Mills, Ph.D. (Biology)
Xuong Nguyen Huu, Ph.D. (Biology, Chemistry)
Paul D. Saltman, Ph.D. (Biology)
Gordon Sato, Ph.D. (Biology)
Gerhard N. Schrauzer, Ph.D. (Chemistry)
Melvin I. Simon, Ph.D. (Biology)
S. Jonathan Singer, Ph.D. (Biology)
Herbert Stern, Ph.D. (Biology)
Teddy G. Traylor, Ph.D. (Chemistry)
Silvio S. Varon, M.D. (Biology)
Bruno H. Zimm, Ph.D. (Chemistry)

Associate Professors:

William S. Allison, Ph.D. (Chemistry)
Stuart Brody, Ph.D. (Biology)
Willie C. Brown, Ph.D. (Biology)
Maarten J. Chrispeels, Ph.D. (Biology)
Edward A. Dennis, Ph.D. (Chemistry)
Robert Fahey, Ph.D. (Chemistry)
Stephen P. Howell, Ph.D. (Biology)
Elvin Harper, Ph.D. (Chemistry)
Jack Kyte, Ph.D. (Chemistry)
William F. Loomis, Jr., Ph.D. (Biology)
Paul A. Price, Ph.D. (Biology)
Percy J. Russell, Ph.D. (Biology)
Immo Scheffler, Ph.D. (Biology)
Douglas W. Smith, Ph.D. (Biology)
Susan S. Taylor, Ph.D. (Chemistry)

Assistant Professors:

John Leong, Ph.D. (Chemistry)
Ramon Piñon, Ph.D. (Biology)

* * *

Melvin Cohn, Ph.D., *Adjunct Professor of Biology*
Francis H. C. Crick, Ph.D., *Adjunct Professor of Biology and Chemistry*
Walter Eckhart, Ph.D., *Associate Adjunct Professor of Biology*
Robert Holley, Ph.D., *Adjunct Professor of Chemistry*
Yasuo Hotta, Ph.D., *Research Biologist*

Biochemistry

Frank M. Hunnekens, Ph.D., *Adjunct Professor of Biology and Chemistry*
Leslie E. Orgel, Ph.D., *Adjunct Professor of Chemistry*

The Undergraduate Program

The Departments of Biology and Chemistry both offer undergraduate courses in biochemistry. The specialization in biochemistry for biology majors and the recommended courses are discussed in the biology section of this catalog. The Department of Chemistry offers a major in chemistry with a concentration in biochemistry described below. This program is designed for those wishing to major in chemistry but with an emphasis on biochemistry. With the options indicated, it is suitable for premedical students. 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 other courses in biology and chemistry. A minimum amount of organic, physical, and inorganic chemistry is necessary.

The complete upper-division requirements are:

1. Two quarters of physical chemistry (Chem. 131, 132);
2. Three quarters of organic chemistry (Chem. 141A-B-C).
3. One quarter of inorganic chemistry (Chem. 120A).
4. Three quarters of biochemistry (Chem. 114A-B-C).
5. Four laboratory courses (143A-B, 105A and one of the following: Chem. 112, 143C, or 105B).
6. Four additional elective courses 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, 115, 121, 122, 124, 131, 136, 141, 143, 151, 153, 156.

Chem. 199 may not be used as a required or elective course, or to satisfy any course requirements 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 prior petition since no petitions after the fact can be granted. The following schedule is only an example.

Major Program in Chemistry for Biochemistry Concentrators (Typical Program)

FALL	WINTER	SPRING
Sophomore Year At least two of the required three quarters of organic chemistry		
Junior Year*		
Chem. 114A	Chem. 114B	Chem. 114C
Chem. 143A	Chem. 143B	Chem. 112
	Chem. 131	Chem. 132
Senior Year		
Chem. 113**	Chem. 116**	Chem. 117**
Chem. 120A	Chem. 105A	Chem. 121**

*Premedical students are advised also to take three upper-division biology courses in their junior year. These may be from the list above and count as electives in place of ** courses and should include Biol. 131, Genetics, in the junior year.

**Elective courses

The Graduate Program

The Departments of Biology and Chemistry offer a program of research training, courses, and seminars leading to the Ph.D. degree in either biology or chemistry with an emphasis in biochemistry. Each student selects a graduate research problem in the field of interest of a member of the faculty listed above. Normally, a student will select a faculty member from the department to which he or she is admitted, but may, with permission of his or her departmental chairperson, choose an adviser from the other department.

A student must meet the degree requirements of the department to which he or she is admitted; these are discussed separately by the Departments of Biology and Chemistry. A program of biology and chemistry course offerings is described herein; other courses in biochemistry and related fields are listed in the course offerings of either the Department of Biology or the Department of Chemistry.

Interested students may obtain application forms and further information from the Department of Biology or the Department of Chemistry, University of California, San Diego, La Jolla, California, 92093. Students should indicate their interest in specializing in biochemistry.

Graduate Program in Biochemistry 1980-81

The following schedule of course offerings is available for first-year graduate students in the Department of Chemistry:

FALL	WINTER	SPRING
213 Macro-molecules	221 Energy Trans.	217 Human Biochem.
219 Special Topics	222 Biochem Evolution	267 Lipids Diseases

(1) Students who do not have sufficient background should take a beginning course such as Chem. 211 in the fall or Chem. 114A and 114B in the fall and winter of the first year.

(2) The Biochemistry Seminar (Chem. 295) is given each quarter. All graduate students should attend regularly and enroll in it all quarters after the first year.

(3) Chem. 210, Seminar in Biochemistry, will be offered most quarters. All students should take this at least one quarter each year after the first year.

Courses

The following courses in biochemistry and related fields are listed in the course offerings of either the Departments of Biology or Chemistry:

Undergraduate

101. Biochemistry

See Biology listing.

102. Biochemistry II

See Biology listing.

103. Biochemical Techniques

See Biology listing.

104. Physical Biochemistry I

See Biology listing.

105. Physical Biochemistry II

See Biology listing.

112. Molecular Biochemistry Laboratory (4)

The application of techniques including electrophoresis, peptide mapping and sequencing, affinity chromatography, amino-acid analysis, gas liquid chromatography, and enzyme kinetics to the study of the chemistry of protein structure and function and the chemistry of lipids, carbohydrates, and nucleic acids. *Prerequisites:* Chem. 141A-B-C, 143A-B and 114A-B (Some of these may be taken concurrently.) (S)

113. Chemistry of Biological Macromolecules (4)

A quantitative discussion of the structure of biologically important macromolecules and the techniques used in their study. *Prerequisites:* organic chemistry, biochemistry, and at least two quarters of upper-division physical chemistry. (F)

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, carbohydrate purines, pyrimidines, proteins, nucleic acids. *Prerequisite:* Chem. 114A (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:* Biochem. 114B. (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. (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)

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, introductory biochemistry.* (W)

167. Biochemistry of Lipid Diseases (3)

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. (S)

199. Independent Study in Biology or Chemistry (2 or 4)

Independent literature or laboratory research by arrangement with, and under the direction of, a member of the biology or chemistry faculty. *Prerequisites: consent of instructor and department.* (P/NP grades only.) (F,W,S)

Graduate

The course offerings of the Department of Chemistry are listed below:

210. Seminar in Biochemistry (1)

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 evaluation, 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. (F,W,S)

211. Biochemistry I (5)

A comprehensive course in biochemistry including structural, metabolic, and human biochemistry. *Prerequisites: physical and organic chemistry, graduate-student standing.* (F)

213. Chemistry of Biological Macromolecules (3)

A quantitative discussion of the structure of biologically important macromolecules and the techniques used in their study. *Prerequisites: 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 or consent of instructor.*

215. Nutritional Biochemistry (2)

The biochemical basis of human nutrition will be emphasized. *Prerequisite: Chem. 211 which may be taken concurrently, graduate student standing.* (F)

216. Chemistry of Enzyme Catalyzed Reactions (3)

The chemistry of representative enzyme catalyzed reactions is presented. Enzyme reaction mechanisms and coenzyme chemistry are emphasized. (S)

217. Human Biochemistry (4)

An advanced course in biochemistry primarily dealing with the molecular basis of human disorders. *Prerequisite: Chem. 211 or equivalent (may be taken concurrently).* (S)

218. Biochemistry II (3)

Advanced topics and recent advances in biochemistry for students already familiar with the subject matters of elementary courses. *Prerequisites: physical and organic chemistry and Chem. 211 or equivalent.* (F)

219A-B-C. Special Topics in Biochemistry (3-3-3)

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.*

221. Energy Transduction (3)

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 (3)

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.* (W)

267. Biochemistry of Lipid and Lipoprotein Diseases (2)

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. (S)

268. Biochemistry of Neoplastic Diseases (3)

Special emphasis will be placed on basic aspects of chemo- and immuno-therapy, mechanism of action of anticancer agents, rational and empirical approaches to the inhibition of malignant cells. Theories relating to viral and chemical carcinogenesis will be discussed. *Prerequisite: introductory biochemistry.* (S)

269. Biological and Biochemical Approaches to Cancer (2)

Invited speakers from outside the university as well as from the university will present lectures on current topics in the biology and chemistry of cancer; a separate session will be held weekly in which the instructor will meet with students to discuss the significance and contents of the lecturer's talk. *Prerequisite: biochemistry or molecular-biology course.* (W)

277. Clinical Correlates (2)

Clinical correlates will stress the close ties between clinical medicine and the basic sciences and the two-way interactions among practicing doctors and research scientists. Most sessions will start with presentation of a clinical case by an attending practitioner and an analysis by the clinician of the basic principles demonstrated by each case. There will follow an extended period of open discussion between basic scientists, clinicians and students. *Prerequisites: graduate-student standing, Chem. 211, 217, Biol. 251, 252, 253, 254, all of which may be taken concurrently.* (S/U grades only.)

295. Biochemistry Seminar (2)**299. Research in Biology or Chemistry (1-12)**

BIOLOGY

OFFICE: 2130 Bonner Hall, Revelle College

Professors:

Warren L. Butler, Ph.D.
Maarten J. Chrispeels, Ph.D.
Richard W. Dutton, Ph.D.
Morris E. Friedkin, Ph.D.
E. Peter Geiduschek, Ph.D.
Melvin H. Green, Ph.D.
Clifford Grobstein, Ph.D.
Masaki Hayashi, Ph.D.
Donald R. Helinski, Ph.D. (Chairman)
John J. Holland, Ph.D.
Dan L. Lindsley, Ph.D.
William F. Loomis, Jr., Ph.D.

William D. McElroy, Ph.D.
Stanley E. Mills, Ph.D.
Maurice Montal, Ph.D.
Xuong Nguyen-Huu, Ph.D.
Paul D. Saltman, Ph.D.
Gordon H. Sato, Ph.D.
Melvin I. Simon, Ph.D.
S. Jonathan Singer, Ph.D.
Herbert Stern, Ph.D.
Kiyoteru Tokuyasu, Ph.D. (in Residence)
Silvio S. Varon, M.D.
Christopher J. Wills, Ph.D.

Associate Professors:

Bruce S. Baker, Ph.D.
Darwin K. Berg, Ph.D.
Jack W. Bradbury, Ph.D.
Stuart Brody, Ph.D.
Willie C. Brown, Ph.D.
Adelaide T. C. Carpenter, Ph.D.
Richard A. Firtel, Ph.D.
P. A. G. Fortes, M.D., Ph.D.
Michael E. Gilpin, Ph.D.
Stephen H. Howell, Ph.D.
S. Ian T. Kennedy, Ph.D.
William B. Kristan, Jr., Ph.D.
Muriel N. Nesbitt, Ph.D.
Ramon Piñon, Ph.D.
Paul A. Price, Ph.D.
Percy J. Russell, Ph.D.
Milton H. Saier, Ph.D.
Immo E. Scheffler, Ph.D.
Allen I. Selverston, Ph.D.
Douglas W. Smith, Ph.D.
Meredith G. Somero, Ph.D.
Nicholas C. Spitzer, Ph.D.
David S. Woodruff, Ph.D.
Juan Yguerabide, Ph.D.

Assistant Professors:

Ted J. Case, Ph.D.
William A. Harris, Ph.D.
Deborah Spector, Ph.D.
Sandra L. Vehrencamp, Ph.D.

Yasuo Hotta, Ph.D., *Research Biologist*
Suzanne Bourgeois, Ph.D., *Adjunct Professor*
Melvin Cohn, Ph.D., *Adjunct Professor*
Francis H. C. Crick, Ph.D., *Adjunct Professor*
Walter Eckhart, Ph.D., *Adjunct Professor*
Frank M. Huennekens, Ph.D., *Adjunct Professor*
Anthony R. Hunter, Ph.D., *Associate Adjunct Professor*
Norman R. Klinman, Ph.D., *Adjunct Professor*
David Kohne, Ph.D., *Adjunct Professor*
Inder Verma, Ph.D., *Associate Adjunct Professor*
William O. Weigle, Ph.D., *Adjunct Professor*

Major Programs

The UC San Diego 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 UC San Diego 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 five 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) microbiology, and (5) population biology. The requirements of each of the majors are designed to meet the needs of a different group of students. These requirements are quite concordant reflecting the department's philosophy that familiarity with certain basic aspects of the subject are fundamental to all specialized understanding. Degrees granted in each of these majors will be so designated.

Each major program has its official faculty coordinator whom students interested in entering the major may consult. For the current academic year they are as follows:

General biology: Dr. John J. Holland,
5155 Muir Biology Building
Animal physiology: Dr. William B. Kristan,
1309 Bonner Hall
Biochemistry and cell biology: Dr. Immo
Scheffler, 3402 Bonner Hall
Microbiology: Dr. Willie C. Brown, 3115
Muir Biology Building
Population biology: Dr. Michael E. Gilpin,
3258 Muir Biology Building

In addition, a departmental office has been designated to handle the routine administration of each major program. They are as follows:

General biology: 1208 Muir Biology
Building

Animal physiology: 2246 Bonner Hall
Biochemistry and cell biology: 2246
Bonner Hall

Microbiology: 1218 Muir Biology Building
Population biology: 1218 Muir Biology
Building

Finally, students majoring in biology are entitled to their own faculty advisers. Faculty adviser assignments are made in the offices specified above.

The lower-division requirements in mathematics, physics, and chemistry are similar for all of the major programs with the exception of population biology. All include three quarters of mathematics, three quarters of physics, two or three quarters of chemistry, and at least one laboratory course in chemistry and one laboratory course in physics. The following three integrated sequences are listed in ascending order of rigor:

	Sequence 1	Sequence 2	Sequence 3
Mathematics	1A-B-C	2A-B-C	2B-C
Physics	1A-B-C	2A-B-D	2A-B-D
Chemistry	6A-B-C	6A-B-C	7A-B

Sequence 1 is suitable for all majors, but students with special interests in physical or chemical aspects of biology are urged to opt for Sequence 2 or 3. For Sequences 1 and 2 it is recommended that the mathematics and chemistry be taken in the freshman year and physics in the sophomore year. Sequence 3 is suitable for students who by virtue of their background are able to enroll as first-quarter freshmen in Mathematics 2B or higher; they can begin Physics 2A in the fall quarter of the freshman year and begin Chemistry 7A in the winter quarter of the sophomore year. Laboratories may be taken according to students' schedules and interests.

All biology major programs require at least two quarters of the three-quarter introductory biology sequence; *i.e.*, Biology 1 plus either Biology 2 or Biology 3. All three quarters are strongly recommended, as they provide exceedingly useful background for upper-division course work. It is also recommended that, where possible, enrollment in Biology 1 be delayed until a student has completed two quarters of introductory chemistry. Students who have earned a score of 4 or 5 in the Placement Examination in Biology of the College Entrance Examination Board may be excused from the requirement for introductory biology.

The different majors variously require thirteen to fifteen upper-division or graduate courses in biology and related subjects. Only one quarter of Biology 195

and one of Biology 198 or Biology 199 may be applied toward this requirement. With the exception of Biology 195, 198, and 199 all required upper-division courses must be taken for a letter grade unless specifically exempted from this requirement in the course description. Transfer students must take at least nine of these required upper-division courses at UC San Diego in order to graduate with a major in any of the five programs offered by the Department of Biology.

GENERAL BIOLOGY MAJOR

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: Biology 1, 2, and 3

Mathematics, Physics, Chemistry: Sequence 1, 2, or 3 (see above.)

Upper-Division Requirements:

Specific requirements have been held to a minimum for this major in order to allow students maximum freedom in fitting course schedules to their particular needs. 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. In addition, general biology majors must take at least ten other upper-division or graduate courses in biology or related sciences, including at least one four-unit upper-division laboratory course. Only one quarter of Biology 195 and one of Biology 198 or 199 may be applied toward this fourteen-course requirement. 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

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: Biology 1 and 2. In addition, Biology 3 is strongly recommended. Students interested in concentrating on studying the nervous system should take Biology 17 in addition to, or in place of, Biology 3.

Mathematics, Physics, Chemistry: Sequence 1, 2, or 3 (see page 178.)

Upper-Division Requirements:

Listed below are the courses required for the 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 physiology major. By choosing four other 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, 143A)
2. Biochemistry (Biology 101)
3. Molecular Biology (Biology 106)
4. Genetics (Biology 131)
5. Mammalian Physiology (Biology 151 & 153)
6. Comparative Physiology (Biology 155)
7. Neurobiology (Biology 156)
8. One of three Physiology Laboratories (Biology 152, Biology 154 or Biology 157)

9. Four other upper-division or graduate courses in biology or related subjects. These may include no more than one quarter of Biology 195 and one quarter of either Biology 198 or Biology 199. Acceptable courses outside biology include AMES 172, 173, 180, and 271; Chemistry 122, 126, and 128; Psychology 102, 106, 150, and 159; and SIO 281 and 282; also any course offered by the graduate programs in neurosciences or physiology-pharmacology may be counted toward this major.
10. A GPA of at least 2.0 in the required upper-division courses is required for graduation with a major in animal physiology.

BIOCHEMISTRY AND CELL BIOLOGY MAJOR

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: Biology 1 and either Biology 2 or 3; both are recommended.

Mathematics, Physics, Chemistry: Sequence 1, 2, or 3 (See page 178.) Sequences 2 and 3 provide the most appropriate background for the biochemistry and cell biology major. Students intending to pursue this major are strongly advised to enroll in the courses in sequence 2 or 3 in preference to those in sequence 1.

Upper-Division Requirements:

1. Two quarters of Organic Chemistry (Chemistry 140A-B)
2. One Chemistry Laboratory. Organic Chemistry (Chemistry 143A) or Physical Chemistry (Chemistry 105A)
3. Biochemistry I (Biology 101)
4. Biochemistry Laboratory (Biology 103)
5. Physical Biochemistry I (Biology 104) (Chemistry 128 also satisfies this requirement).
6. Molecular Biology (Biology 106)
7. Cell Biology (Biology 111)
8. Genetics (Biology 131)
9. One upper-division lab other than Biology 199; e.g., Cell Biology (Biology 112), Eucaryotic Genetics (Biology 132), Microbial Genetics (Biology 137)
10. At least five more upper-division or graduate courses in biology or related subjects. Only one quarter of Biology 195 and one of Biology 198 or 199 may be applied toward the fulfillment of this requirement. Acceptable courses outside Biology include Chemistry 113, 116, and 117; Physics 153; and SIO 281, 284, 285, and 286.
11. A GPA of 2.0 must be maintained in the above required courses in order to graduate with a degree in biochemistry and cell biology.

MICROBIOLOGY MAJOR

The microbiology major is designed to prepare students 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: Biology 1 and either Biology 2 or 3; both are recommended.

Mathematics, Physics, Chemistry: Sequence 1, 2, or 3 (See page 178.)

Biology

Upper-Division Requirements:

1. Two quarters Organic Chemistry (Chemistry 140A-B)
2. Organic Chemistry Laboratory (Chemistry 143A)
3. Biochemistry I (Biology 101)
4. Biochemistry Laboratory (Biology 103)
5. Molecular Biology (Biology 106)
6. Immunology (Biology 113)
7. Genetics (Biology 131)
8. Bacteriology (Biology 141)
9. Laboratory in Microbiology (Biology 142)
10. Animal Virology (Biology 143)
11. At least four other upper-division or graduate courses in biology or related subjects. These may include no more than one quarter of Biology 195 and one quarter of Biology 198 or 199. 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)
 - Microbial Genetics Laboratory (Biology 137)
 - Medical Microbiology (Biology 144)
 - Microbial Ecology (SIO 287A)
 - Experimental Microbiology (SIO 287B)
 - Microbial Metabolism (SIO 287C)
 - Microbial Biosynthesis (SIO 287D)
12. Students must maintain a GPA of at least 2.0 in the required upper-division courses in order to graduate with a major in microbiology.

POPULATION BIOLOGY MAJOR

Population biology includes the fields of ecology, animal behavior and sociobiology, population genetics, and evolution. Each of these fields consists of a variety of sub-disciplines: e.g., ecology includes population ecology, community ecology, biogeography, theoretical ecology, etc. The fields have in common a focus on evolutionary processes and whole animals in relation to each other and their ambient environments. Research careers in population biology range from tropical ecology studies to work on the communication signals of marine invertebrates. While the general principles are the same, the species, the contexts, and the method are enormously

varied. Applied careers for population biologists are equally varied: recent graduates now work in forestry, wildlife management, as ecological consultants for the government and private industry, or in new fields such as ecological medicine and epidemiology or environmental design and environmental planning.

Because population biology spans such a variety of topics and methods, the major in population biology has been designed to provide the basic fundamentals while allowing maximum flexibility within the general topic areas. Once students have completed a year of introductory biology, they may wish to consult with the population biology faculty coordinator to design a specific track within the major. Some students may wish to follow a mathematically-oriented track in population biology. A more classical track would incorporate courses in biochemistry, cellular or molecular biology, development, and physiology. All population biology majors regardless of interests must complete the following minimal requirements to graduate:

Lower-Division Requirements:

Biology: Biology 1, 2, and 3.

Mathematics: Mathematics 2A and B plus one additional quarter from the following: Mathematics 2C, Mathematics 2D, Mathematics 2E, Math 80A, Mathematics 80B, Psychology 60, Psychology 111 or SIO 296. Students entering with calculus backgrounds equivalent to Math 2A and 2B need only take the additional quarter if approved by the Population Biology Faculty Coordinator.

Chemistry: Three quarters of chemistry are required. Laboratories in chemistry do *not* count towards this requirement. Note that students who intend to take biochemistry will need at least two quarters of Chemistry 6 and two quarters of Organic Chemistry (Chemistry 140A-B).

Physics: Two quarters of physics are required. Laboratories in physics do *not* count towards this requirement.

Upper-Division Requirements:

1. Genetics (Biology 131)
2. Population Biology. Five quarter-courses chosen from Biology 135, Biology 161 through Biology 170, SIO 170, 275A-B-C, SIO 293A-B-L, and SIO 296.
3. Seven additional upper-division or graduate courses in biology or related sciences or in mathematics. Courses

offered outside of the Department of Biology that are especially appropriate for students with an interest in population biology are Anthropology 25, Anthropology 100, Anthropology 101, Anthropology 159, Anthropology 246, EECS 61, Mathematics 80A-B, Mathematics 2D-E, Mathematics 180 A-B-C, Mathematics 181A-B, Mathematics 111A-B, Mathematics 211 A-B, or any graduate course in statistics, Psychology 60, Psychology 111, or Psychology 149.

4. The above requirements must include at least twelve units of upper-division laboratory or field courses. Certain intensive summer-session courses offered at various universities and field studies throughout the country may be used to satisfy partially this requirement if approval is obtained from the faculty coordinator of the major. Neither Biology 198 nor Biology 199 may be used to satisfy this requirement. Acceptable options include Biology 103, Biology 112, Biology 124, Biology 132, Biology 137, Biology 142, Biology 152, Biology 154, Biology 168, Biology 169, Biology 170, SIO 275C, and SIO 293L. Substitutions may be possible with approval of the major coordinator.
5. Students must maintain a GPA of at least 2.0 in the required upper-division courses in order to graduate with a major in population biology.

HONORS THESIS IN BIOLOGY

Students in any of the major programs who have a 3.7 grade-point average or above in upper-division science courses at the end of their junior year are eligible to undertake the honors thesis. This program covers the senior year of undergraduate study and primarily involves twelve units of senior thesis research (Biology 196) taken in addition to the major requirements for graduation. Research is conducted under the supervision of a faculty member of the Department of Biology. The research will culminate in a senior thesis prepared in conformity with rigorous standards and an oral report to an audience which includes members of the Department of Biology faculty. 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.

Potential candidates will be notified during the spring quarter of their junior year. Students interested in the program who are eligible at the end of the spring quarter must find a faculty member willing to act in the capacity of thesis adviser. After an adviser is selected, a petition should be sent to the faculty coordinator of the student's major. The petition should contain the research proposal, as defined in consultation with the honors thesis adviser and a GPA certification, which may be obtained from the official office of the student's major program. Approval may be obtained from the major program faculty coordinator at the beginning of the summer session by students wishing to start the program during the summer preceding the senior year.

Minor in Biology

The lower-division biology courses (Biology 11-20) are intended for nonmajors but in preparation for upper-division courses, students wishing to minor in biology are advised to take the sequence Biology 1, 2, and 3. This sequence will be adequate preparation for the following upper-division courses: Genetics (Biology 131), Introduction to Human Genetics (Biology 133; restricted to nonmajors), Comparative Physiology (Biology 155), Population Ecology (Biology 161), Sociobiology (Biology 164), and Ethology (Biology 166). Biology courses with a more molecular orientation require at least biochemistry as a prerequisite, which in turn has organic chemistry as a prerequisite. Students wishing to take such courses as minors may have to take more than the minimum load of courses.

The Graduate 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 department does not have a master's degree program.

There are no inflexible requirements for entrance to graduate study in the Department of Biology, 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 molecular and cell biology, biochemistry and biophysics, genetics and regulation, de-

velopmental biology, neurobiology, population biology, and immunology.

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 and cell biology. The only other course requirement is 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 of four years during graduate study. 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. By the end of the third year, the student is required to have completed a two-part oral examination in order to be admitted to candidacy for the Ph.D. degree. The purpose of these 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 collaboration with the Department of Marine Biology of the Scripps Institution of Oceanography, with the Scripps Clinic and Research Foundation, and with the Salk Institute for Biological Studies. Students may carry out dissertation research in collaboration with members of these groups.

Courses

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 lectures and one hour of recitation. *Prerequisites:* two quarters of introductory chemistry are recommended, the second quarter of chemistry may be taken concurrently. *Required of all biology majors.* (FWS)

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 principals 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:* Biol 1 or a full year of high-school biology. (F,S; not offered in fall, 1980)

4. Zoology Laboratory (2)

A laboratory course in animal biology. Four hours laboratory. *Prerequisite:* Biol 1 (may be taken concurrently) (W,S)

5A-B-C. Health Professions Biology (A,B,C) (4-4-4)

This three-quarter sequence includes evolution, genetics, molecular, cell and developmental biology, nutrition, and physiology. Structure-function relations, an analytical approach, and relevance to human well-being emphasized. Outside reading and classroom discussion supplement lectures. Three hours of lecture and one hour of laboratory or discussion. *Prerequisite:* consent of instructor. (FWS)

11. Introduction to Modern Biology (4)

This course stresses some fundamental concepts of cell and organismic biology using a microbiological approach. Major topics covered include cell structure and function, cell and organismic diversity, and interactions among biological systems. This course is cross-listed as Science and Technology 10A and is intended to satisfy the Third College general-education requirement in biology. No previous exposure to biology is assumed. Three hours of lecture and two hours of discussion/recitation. *Does not satisfy a lower-division requirement for any Department of Biology major.* (F)

12. The Chemistry and Genetics of Cells and Organisms (4)

For non-biology majors, an introduction to elementary chemistry and genetics, with illustrations drawn from human biology. Three hours of lecture. *Does not satisfy a lower-division requirement for any Department of Biology major.* (F)

13. Plants and People (4)

Biological principles of human nutrition, plant growth, and agricultural food production necessary to understand the possibilities and the limitations of agriculture to feed the rapidly growing world population. Three hours of lecture. *Does not satisfy a lower-division requirement for any Department of Biology major.* (W) (May not be offered in 1980-1981)

14. Fundamentals in Human Biology (4)

Course introduces elements of human physiology. Topics include human evolution, nutrition, disease, and environmental adaptation. *Does not satisfy a lower-division requirement for any Department of Biology major.* (F)

15. General Microbiology (4)

General principles of microbiology for nonscientists with emphasis on the cell biology of microorganisms and of the cells with which they interact in causing diseases of man and animals. The microbiology of infection by bacteria, fungi, and viruses, and host responses to infection. Three hours of lecture. *Does not satisfy a lower-division requirement for any Department of Biology major.* (S)

16. The Biology of Reproduction (4)

A survey and analysis of sexual reproduction in various organisms with special emphasis on humans. Three hours of lecture. *Prerequisite:* Biol 1, Biol 14, or the equivalent. *Does not satisfy a lower-division requirement for any Department of Biology major.* (W)

17. Neurobiology and Behavior (4)

Introduction to the organization and functions of the nervous system. Topics will include molecular, cellular, developmental systems, and behavioral neurobiology. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 1, Biol. 14, or the equivalent. Does not satisfy a lower-division requirement for any Department of Biology major.* (W)

18. Biology of 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. Each lecture-discussion period will be given by an invited lecturer who is prominent in cancer research. Three hours of lecture. (P/NP grades only.) *Prerequisites: Biol. 1, Biol. 14, or the equivalent. Does not satisfy a lower-division requirement for any Department of Biology major.* (S)

19. Introduction to Nutrition (4)

A survey of contemporary understanding of the basic biology and chemistry involved in nutrition for humans. Discussion of aspects of food, its production and distribution as well as its cultural and economic consequences. Nutrition will be used as a means of introducing students to a world of human biology, as well as relating important aspects of diet to public health. Three hours of lecture. *Does not satisfy a lower-division requirement for any Department of Biology major.* (S)

20. Ecology and Man (4)

An introduction to modern ecological principles and their relation to current human affairs. Topics include: population growth and demography, habitat alteration, conservation, pollution, the relation of environment to disease and pests. Three hours of lecture and one hour of demonstration. *Does not satisfy a lower-division requirement for any Department of Biology major.* (F)

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. *Prerequisite: two quarters of organic chemistry (second quarter may be taken concurrently)* (F,W,S)

102. Biochemistry 2 (4)

Continuation of Biochemistry 1. Topics will include biosynthesis and oxidation of amino acids and nucleotides, the urea cycle, nitrogen fixation, and photosynthesis; serine proteases and blood coagulation, macromolecular assembly and biochemistry of collagen, elastin, and complex carbohydrates, and hormonal regulation of calcium and skeletal homeostasis. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 101 (W)*

103. Biochemical Techniques (4)

A laboratory-lecture course in the application of biochemical methods to biological problems. One hour of lecture and ten hours of laboratory. *Prerequisite: Biol. 101 (may be taken concurrently)* (F,W,S)

104. Physical Biochemistry 1 (4)

Thermodynamics, chemical equilibria, bioenergetics. Directed toward an understanding of energy transductions in biological systems with emphasis on respiration and photosynthesis. Three hours of lecture and one hour of recitation. *Prerequisites: calculus, lower-division chemistry sequence* (F)

105. Physical Biochemistry 2 (4)

Concepts and uses of physical techniques in biology: EM radiation, UV, IR, CD, ORD, x-ray diffraction, fluorescence, reversible thermodynamics, sedimentation, electrophoresis, Electrolytes in solution, Photochemistry, action spectra, energy transfer, isotopes. Three hours of lecture. *Prerequisites: organic chemistry, basic physics, calculus* (W)

106. Molecular Biology (4)

Molecular analysis of gene action: DNA structure, rearrangements, replication, transcription, protein synthesis. Regulation of gene activity, viruses and their developments. Emphasis on prokaryotes, but with extensive discussion of eucaryotes. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 101 and Biol. 131* (W,S)

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* (W)

108. Immunochemistry (4)

Discussion of antibodies, antigens complement, and their interactions. Three hours of lecture. *Prerequisite: Biol. 101* (S)

109. Photobiology (4)

Basic principles of photobiology and photochemistry. Photochemical mechanisms in photosynthesis. Photoreceptor pigment systems and photobiological control mechanisms in living organisms. *Prerequisites: Biol. 101 and Biol. 104 or the equivalent* (S)

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. 101 and Biol. 131; Biol. 104 recommended* (F,S)

112. Molecular and Cell Biology Laboratory (4)

A laboratory course in the application of cellular techniques to biological problems. Ten hours of laboratory. *Prerequisite: Biol. 111* (F)

113. Immunology (4)

The course will deal with antibody biosynthesis, antibody structures, antigens, antigen-antibody interactions, immune response, immunological unresponsiveness, *in vivo* and *in vitro* consequences of antigen-antibody interactions, delayed hypersensitivity, control of the immune response, and transplantation immunities. Three hours of lecture. *Prerequisite: Biol. 101* (W)

114. Membrane Biology (4)

Biophysical and biochemical properties of membranes in prokaryotic and eucaryotic cells: Membrane structure and dynamics. Biosynthesis and assembly of membrane components. Molecular mechanisms of solute transport. Biophysics of excitable membranes and membrane receptors. Mechanisms of energy coupling and active transport. Regulation of membrane enzymes. Cellular motility and chemotaxis. Emphasis on certain subjects will vary from year to year to discuss the most recent developments. Three hours of lecture. *Prerequisite: Biol. 101; Biol. 104 is strongly recommended.* (F)

115. Endocrinology (4)

This course will cover the endocrine physiology of mammals with emphasis on human endocrinology. Topics covered will be neuroendocrinology, reproductive physiology, and mechanism of hormone action. Three hours of lecture. *Prerequisite: consent of instructor.* (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)* (S)

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. Three hours of lecture. *Prerequisites: Biol. 102 and Biol. 131; Biol. 106 is recommended* (S)

122. Human Reproduction and Development (4)

The course is concerned with the physiology of reproduction, including gametogenesis, fertilization, and implantation. Special emphasis is placed on the development of the reproductive system. Three hours of lecture. *Prerequisites: Biol. 101 and Biol. 131* (W)

123. Embryology Laboratory (2)

Descriptive and experimental embryology of marine organisms and of vertebrates. One hour of lecture and four hours of laboratory. *Prerequisites: upper-division standing and Biol. 2 or the equivalent.* (F) (Not offered in 1980-81.)

124. Developmental Physiology of Plants (4)

The development of plants is examined from embryogenesis through reproduction and aging. Emphasis is placed on those aspects of development which can be understood in biochemical terms. Embryogeny, seed formation, germination, the action of plant hormones, photosynthesis, and senescence are studied. Three hours of lecture. *Prerequisite: Biol. 101* (W) (Probably not offered in 1980-81.)

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, 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. *Prerequisite: Biol. 106* (S) (Not offered in 1980-81.)

GENETICS

131. Genetics (4)

An introduction to the principles of heredity in diploid organisms, fungi, bacteria, and viruses. Mendelian inheritance; population 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 principals of Mendelian inheritance and will require the student to apply both cytological and genetic analysis to the solution of problems of transmission genetics. One hour of lecture and seven hours of laboratory. *Prerequisite: Biol. 131 (may not be taken concurrently)* (W)

133. Introduction to Human Genetics (4)

The principles of genetics as they apply to human beings. Normal and abnormal human chromosomes. Mendelian inheritance in man, human biochemical genetics, genetics of human population. Not open to biology majors. A student may not receive credit for both the course and 101. Three hours of lecture and one hour of recitation. *Prerequisites: Biol. 1 or the equivalent and consent of instructor.* (Not offered in 1980-81.)

134. Human Genetics (4)

A detailed examination of a particular topic within the realm of human genetics with readings of original research papers. The topic may change from year to year. Past examples are 1) structure and organization of the human chromosomes; 2) X chromosome inactivation and mosaicism. Students are expected to evaluate assigned readings and participate in class discussions. Three hours of class meeting. *Prerequisite: Biol. 131* (F)

135. Human Population Genetics (4)

Examines the effects of selection, inbreeding, mutation, and drift on the human gene pool. Extent of human genetic diversity. Blood group, histocompatibility and enzyme polymorphisms. Genetic loads and the impact of rare and common genetic diseases. Genetic engineering and eugenics. This course to be offered alternate years. Three hours of lecture. *Prerequisites: Biol. 3 and Biol. 131 or consent of instructor.* (F) (Not offered in 1980-81.)

136. Microbial Genetics (4)

Organization and function of prokaryotic genetic systems including sex factors, transduction, transformation, phage genetics, transposons, genetic engineering. Three hours of lecture. *Prerequisites: 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 microbial eucaryotes. One hour of lecture, one hour of discussion, and eight hours of laboratory. *Prerequisite: Biol. 131, Biol. 135 recommended.* (S)

MICROBIOLOGY

141. Bacteriology (4)

A discussion of the structure, growth, and physiology of prokaryotic microorganisms with emphasis on the diverse activities of bacteria and on the interaction of various bacterial species with their environment. Three hours of lecture and one hour recitation. *Prerequisites: organic chemistry and 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. Studies with fungi include analysis of vegetative morphology and of heterokaryons of *Neurospora*. One hour of demonstration and seven hours of laboratory. *Prerequisites: Biol. 157 and consent of instructors.* (W)

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. *Prerequisite: Biol. 106.* (F)

144. Medical Microbiology (4)

This course covers basic principles and detailed aspects of microbial infectious diseases. Biochemical properties underlying microbial spread, host response, immunity, and recovery will be emphasized. Emphasis is placed upon viral and bacterial diseases including molecular principles of antibody action, drug resistance, and viral and plasmid replication. Three hours of lecture. *Prerequisites: Biol. 106 and Biol. 141.* (S)

PHYSIOLOGY

151. Mammalian Physiology 1 (4)

Lecture course covering nervous, muscular, cardiovascular, hormonal, and reproductive systems. Three hours of lecture. *Prerequisites: Biol. 1, Biol. 2 and Biol. 101.* (F)

152. Mammalian Physiology Laboratory 1 (4)

Topics covered will include membrane physiology, nerve-muscle function, and cardiovascular physiology. Cell and organ functions will be studied in humans and experimental animals. One hour of lecture and ten hours of laboratory. *Prerequisite: Biol. 151 (may be taken concurrently).* (F)

153. Mammalian Physiology 2 (4)

Lecture course covering respiratory, excretory, and gastrointestinal systems. Emphasis is placed on interactions of organ systems for the regulation of body functions. Three hours of lecture. *Prerequisite: Biol. 151 or consent of instructor.* (W)

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 and ten hours of laboratory. *Prerequisite: Biol. 153 (may be taken concurrently).* (W)

155. Comparative Physiology (4)

Structure and function of invertebrate and vertebrate physiological systems. Three hours of lecture. *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. Three hours of lecture. *Prerequisites: Biol. 1, Biol. 2, and Biol. 101.* (S)

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).* (S)

POPULATION BIOLOGY

161. Population Ecology (4)

Introduction to ecological analysis at the level of the population. Population growth in time and space, population genetics, demography, biogeography, epidemiology, human and

applied ecology. Some BASIC computer programming is utilized. Three hours of lecture and two hours of recitation. *Prerequisites: calculus, Science and Technology 20 or the equivalent (may be taken concurrently).* (F)

162. Community Ecology (4)

An examination of the interactions between species in biotic communities, covering theory and laboratory and field studies. Emphasis will be on evolutionary ecology and how natural selection has shaped competitive, predator-prey, and symbiotic relationships in natural communities. Three hours of lecture. *Prerequisite: Biol. 161.* (W)

163. Community Ecology Laboratory (2)

Laboratory exercises and field studies illustrating principles in evolution and ecology of natural communities. Several afternoon field trips and one weekend field trip. *Prerequisite: concurrent enrollment or prior completion of Biol. 162.* (W)

164. Sociobiology (4)

A survey of the patterns of social behavior in invertebrates and vertebrates, including man, and a discussion of the ecological principles underlying the evolution of animal societies. Three hours of lecture and one hour of recitation. *Prerequisite: Biol. 3.* (W)

165. Systems Biology (4)

Introduction to the mathematical analysis of control and communication in biological systems. Models of genetic, neurophysiological, developmental and ecological systems will be constructed and simulated. Statistical tests and regression analysis will be treated. Three hours of lecture. *Prerequisite: Science and Technology 20 or the equivalent.* (S)

166. Ethology (4)

The patterns of evolution of the behavior of animals including man. Classical ethological methods of analysis, physiological mechanisms of behavior, and modern approaches to communication such as game theory and information theory. Three hours of lecture and three hours of lab or field observation. *Prerequisite: Biol. 1.* (S) (May not be offered in 1980-81.)

167. Evolution (4)

Evolutionary processes as discussed in the genetic and ecological contexts. Population genetics, microevolution, macroevolution, and human population genetics. Three hours of lecture. *Prerequisite: Biol. 131 or equivalent.* (S)

168. Field Ecology and Behavior (5)

A laboratory in field techniques for ecology and behavior, with an emphasis on hypothesis testing and statistical methods. Two hours of lecture, one hour of demonstration, and two four-hour field labs. Prior experience with statistics is recommended but not required. *Prerequisites: one upper-division course in ecology, evolution, or sociobiology.* (W)

169. Problems in Marine Biology (16)

An intensive course at Bodega Marine Lab. Students will choose research problems, design experiments and do them under the guidance of instructors from Berkeley and other UC campuses. Ten hours of lecture and fifteen hours of laboratory. *Prerequisites: consent of instructor (application forms must be filed with instructor by January 10). Desirable preparation includes upper-division course work in physiology or population biology.* (S)

170. Research in Field Ecology (16)

An intensive course designed to 1) acquaint students with the biota of natural communities in the Southwestern USA and Mexico; 2) equip them with the methods necessary to solve ecological problems; and 3) refine their abilities to conduct independent research in the field in spite of climate, demanding logistics, and the web of entangling and uncontrolled variables. Students will be away from campus on field trips for most of the quarter. Enrollment limited to twenty students. *Prerequisites: Biol. 160, Biol. 161, Biol. 162, and Biol. 167 AND consent of instructor.* (S) (Not offered in 1980-81.)

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. (F)

182. Invertebrate Zoology (4)

Introduction to the structure, evolution, ecology, and economic importance of the invertebrates. Emphasis on environmental problems and adaptive strategies. Three hours of lecture or three hours of laboratory. *Prerequisite: Biol. 3 or equivalent (e.g., Biol. 11 in the 1979-80 catalog).* (F)

183. Technology and Society (4)

This course concentrates on the policy issues raised by biomedical-scientific advances. The topical content varies from year to year but includes such areas as fertility control, fertilization *in vitro*, recombinant DNA, life support systems, and genetic engineering. Emphasis is placed on necessary mechanisms for interaction of scientific expertise and other perspectives in policy making. (Also listed as Political Science 105C and as Science, Technology and Public Affairs 105C.) *Prerequisites: Pol. Sci. 105A, Science, Technology and Public Affairs 105A, or consent of instructor.* (S)

184. Senior Seminar in Biomedical Science and Public Policy Analysis (4)

Readings and discussion of requirements for effective utilization of biomedical science in public policy analysis with examples drawn from biostandardization (radiation, carcinogenicity, toxicity), bioethics (life support, human experimentation), biological engineering, research policy, etc. (Also listed as Science, Technology and Public Affairs 180.) *Prerequisite: senior or graduate standing.* (W)

Graduate

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.) (F,W,S)

203. Seminar in Immunology (1)

The course involves weekly seminars given by faculty, post-doctoral research fellows, and advanced graduate students concerning current research in immunology and immunochemistry. One hour of lecture. *Prerequisite: consent of instructor.* (S/U grades permitted.) (W)

204. Seminar in Population Biology (1)

Weekly meetings to review current literature on a specified topic in ecology, evolution, behavior, sociobiology, 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,S)

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. Material covered will include such topics as cell wall metabolism, bacterial L forms, spore formation, and germination. *Prerequisite: consent of instructor.* (S/U grades permitted.) (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, and developmental genetics. Designed for graduate students but open to qualified undergraduates. *Prerequisite: Biol. 131* (Quarter variable and not offered every year, to be offered in spring, 1981.)

212. Special Topics in Microbiology (3)

Recent developments in prokaryotic and eucaryotic microbial research. Topics will vary from year to year, but will include plasmid and chromosome replication, cell surface biogenesis, cellular differentiation, viral development, biorhythms, energy interconversions, solute transport, motility and taxis, metabolic regulation, microbial ecology. (S/U grades permitted.)

221. Advanced Genetics (6)

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, biochemical genetics, mammalian somatic-cell genetics, developmental genetics, sex determination, dosage compensation, immunogenetics, etc. Six hours of lecture. *Prerequisites: Biol. 101, Biol. 106, and Biol. 131 or the equivalent provide recommended background (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 covered include prokaryotic and eucaryotic gene structure and regulation, chromatin structure, DNA replication, translation, mechanisms of transcription, and an introduction to viruses. Four hours of lecture and two hours of discussion. *Prerequisites: Biol. 101, Biol. 106, and Biol. 131 or the equivalent. (S/U grades only.)* (W)

223. Advanced Cell Biology (6)

This course will provide an advanced treatment of the following topics: an analysis of the ultrastructural features of cells and their relationship to cellular functions; the structure and functions of membranes, intracellular organelles, cytoskeletal elements; cell motility and mechanochemical activity; cell cycle; and cytokinesis. *Prerequisite: Biol. 111 or the equivalent. (S/U grades only.)* (S)

231. Techniques in Electron Microscopy (3)

Practical training in basic techniques and training in high resolution microscopy, ultracyromicrotomy or kleinschmitting to meet individual needs. Ten hours of laboratory. Students may be interviewed by instructor before registering in this course. *Prerequisite: consent of instructor* Enrollment limited to eight. (S/U grades only.) (W)

232. Virology (3)

The first section of this course consists of an in-depth review of selected topics in virology with emphasis on the molecular biology of animal virus multiplication. The second section (about three-quarters of the course) consists of seminars given by members of the class. Each member selects a topic of current biological interest and with the aid of original research material presents a thirty- to forty-minute dissertation. Three hours of class meeting. *Prerequisite: Biol. 106 or the equivalent. (S/U grades permitted.)* (S)

233. Cellular Immunology (3)

The course covers the cellular events and interactions of the humoral and cellular responses to antigens. *Prerequisites: consent of the instructor; the course is a graduate course not open to undergraduates; Biol. 113 or the equivalent is advisable. (Offered in alternate years; not offered in 1980-81.)*

234. Advanced Cellular Neurobiology (3)

Neural cell types and systemic relationships. Developmental concepts and survey of selected parts of the nervous system. Determination versus expression of neuronal characteristics.

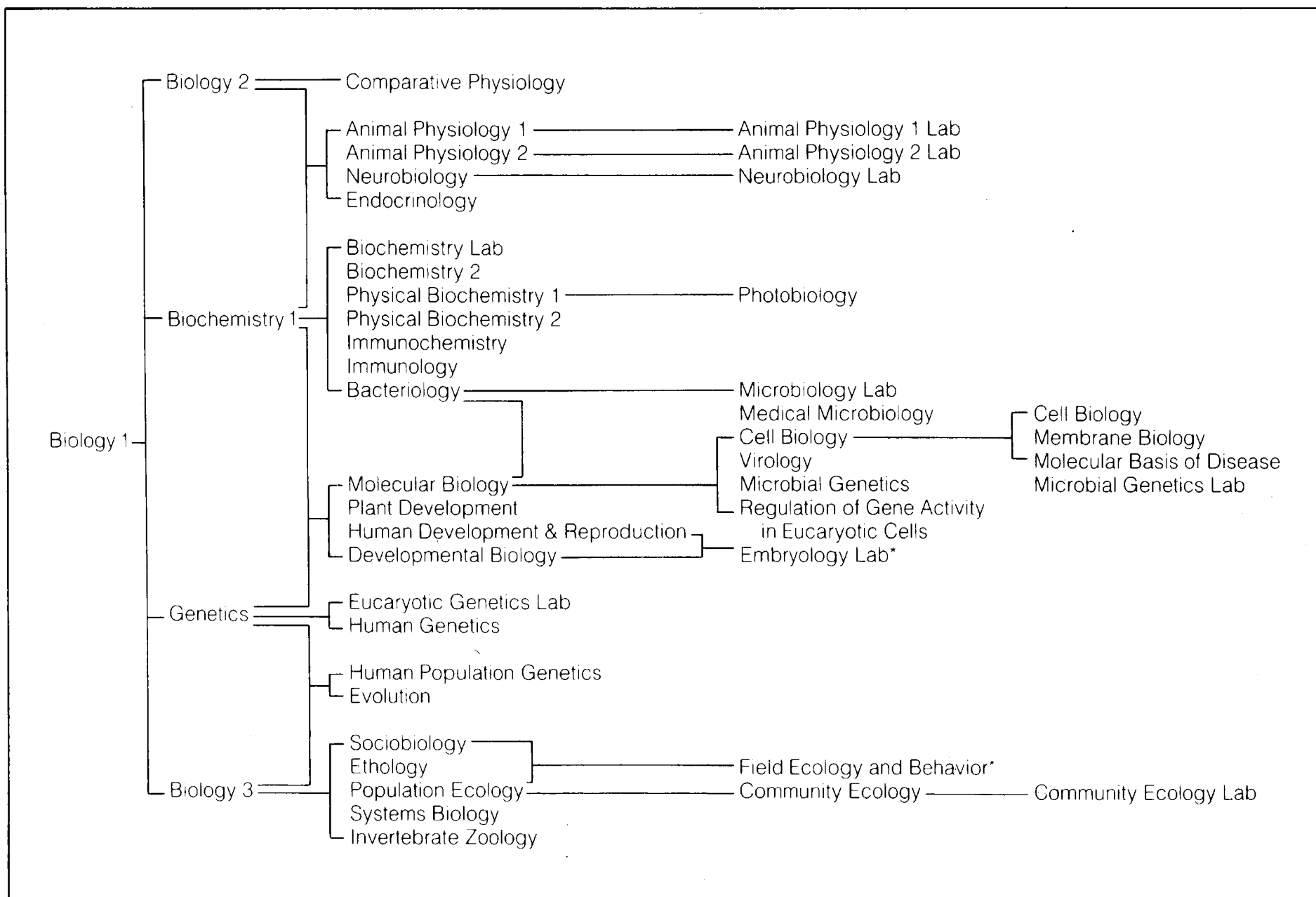
Extrinsic cues from cellular and humoral environments, cultural approaches. Bioelectric and biochemical properties of neurons and glia. Axonal growth and formation of synapses Neuron-glia interactions. *Prerequisite: consent of instructor (S/U grades permitted.)* (Not offered in 1980-81.)

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 UC San Diego 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)

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)



*Any one of the indicated prerequisites fulfills the requirement.

Prerequisite flow chart for biology courses. Each course indicated has as its immediate prerequisite the course or courses to which it is connected in the column to the left of the one in which it is listed. Except for laboratory courses, which may in some cases be taken concurrently with their immediate prerequisites, it is highly advisable for students to have taken the prerequisite courses prior to enrolling in any of the courses listed, since instructors will assume familiarity with the material covered in all prerequisites.

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.* This course is similar in content to Biology 113 but is accelerated in pace. (S/U grades only.) (F)

254. Membrane Biology (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 the 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)

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

OFFICE: 3430 Mayer Hall, Revelle College

This is an undergraduate and graduate program within the Department of Physics, which prepares the students for a career in biophysics.

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation.

The Undergraduate Program**Physics Major with Specialization in Biophysics**

The upper-division program 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.

The following courses are required for the physics major with specialization in biophysics:

(a) Lower-division:

(1) Physics 2A-B-C-D and 2CL-DL; or Physics 3A-B-C-D, 3CL or 2CL, and 2DL. (2) Chemistry 6A-B-C or 7A-B; and Chemistry 8AL-BL. (3) Biology 1. (4) Mathematics 2D-E-F or 2DA-EA-F.

(b) Upper-division:

(1) Physics 100A-B-C, 110A, 120A-B, 130A-B, 153. (2) Chemistry 131, 140A-B, 143A. (3) Biology 101, 103, 106, 111, 131. (4) Mathematics 110. (5) Restricted Elective: Mathematics 120A or Frontiers of Science 128 is recommended.

(c) Suggested schedule:

FALL	WINTER	SPRING
Junior Year		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Mathematics 110	Restricted Elective
Chemistry 140A	Chemistry 140B	Physics 120A
Chemistry 143A	Biology 131	
Senior Year		
Physics 130A	Physics 130B	Biology 103
Physics 120B	Biology 106	Biology 111
Biology 101	Chemistry 131	Physics 153

Physics Major with Specialization in Biophysics-Premedical

The upper-division program is essentially the same as the standard physics major, with some modification to provide the education in biology and chemistry needed for the study of medicine. Students entering the program with deficient backgrounds in mathematics or chemistry will be required to remedy the deficiency in their junior year. The consequent rearrangement of the upper-division program will be devised by consultation between the student and the departmental adviser for biophysics.

The following courses are required for the physics major with specialization in biophysics-premedical:

(a) Lower-Division:

(1) Physics 2A-B-C-D and 2CL-DL; or Physics 3A-B-C-D, 3CL or 2CL, and

2DL. (2) Chemistry 6A-B-C, or 7A-B; and Chemistry 8AL-BL. (3) Biology 1. (4) Mathematics 2D-E-F or 2DA-EA-F.

(b) Upper-division:

(1) Physics 100A-B-C, 110A, 120A-B, 130A, 153. (2) Chemistry 126 or 131, 140A-B, 143A. (3) Biology 101, 106, 111, 131. (4) Restricted Electives: one biology course (Biology 121, 122, or 125), and an upper-division or graduate course in natural sciences or mathematics.

(c) Suggested schedule:

FALL	WINTER	SPRING
Junior Year		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Biology 131	Physics 120A
Chemistry 140A	Chemistry 140B	Chemistry 143A
		Biology 101
Senior Year		
Physics 120B	Chemistry 126 or 131	Physics 153
Physics 130A	Biology 111	Restricted Elective
Biology 106	Restricted Elective	

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). While the requirements for the degree parallel those for the regular Ph.D. in physics, biophysics students substitute certain courses in the life sciences for the normal second-year graduate courses in physics. Please refer to the Department of Physics section of this catalog for a detailed description of the graduate program.

CHEMISTRY

OFFICE: 2112 Urey Hall

Undergraduate — 2132 Urey Hall, Revelle College

Graduate — 2116 Urey Hall, Revelle College

Professors:

John N. Abelson, Ph.D.

James R. Arnold, Ph.D.

Marlene A. DeLuca, Ph.D.

Russell F. Doolittle, Ph.D.

Murray Goodman, Ph.D. (*Chairman*)

Martin D. Kamen, Ph.D. (*Professor Emeritus*)

Chemistry

Nathan O. Kaplan, Ph.D.
David R. Kearns, Ph.D.
Joseph Kraut, Ph.D.
Joseph E. Mayer, Ph.D. (*Professor Emeritus*)
Trevor C. McMorris, Ph.D.
Stanley L. Miller, Ph.D.
Xuong Nguyen Huu, Ph.D.
G. N. Schrauzer, Ph.D.
Kurt E. Shuler, Ph.D.
Hans E. Suess, Ph.D. (*Professor Emeritus*)
eddy G. Traylor, Ph.D.
Harold C. Urey, Ph.D. (*University Professor, Emeritus*)
Ernest Wenkert, Ph.D.
Kent R. Wilson, Ph.D.
Bruno H. Zimm, Ph.D.

Associate Professors:

William S. Allison, Ph.D.
F. Thomas Bond, Ph.D.
Leigh B. Clark, Ph.D.
Edward A. Dennis, Ph.D.
Robert C. Fahey, Ph.D.
Elvin Harper, Ph.D.
Jack E. Kyte, Ph.D.
Robert G. Linck, Ph.D.
Katja Lindenberg, Ph.D.
Kurt Marti, Ph.D.
Hans Oesterreicher, Ph.D.
Charles L. Perrin, Ph.D.
Susan S. Taylor, Ph.D.
Robert L. Vold, Ph.D.
Joseph W. Watson, Ph.D. (*Provost of Third College*)
John H. Weare, Ph.D.
John C. Wheeler, Ph.D.

Assistant Professors:

Michael E. Garst, Ph.D.
John Leong, Ph.D.
Douglas Magde, Ph.D.

Adjunct Professors:

Francis H. C. Crick, Ph.D.
Robert W. Holley, Ph.D.
Frank M. Hunnekens, Ph.D.
Leslie E. Orgel, Ph.D.

The Undergraduate Program

The undergraduate major in chemistry is intended to enable a student to pursue further studies in chemistry or in related fields of science, engineering, or medicine. The program combines a thorough preparation in the fundamentals of chemistry and related fields with an opportunity for more advanced work in particular areas of chemistry.

Lower-Division Requirements

1. General Chemistry (Chem. 6A-B-C or Chem. 7A-B) including laboratory (Chem. 8AL-BL) or equivalent.
2. One year of physics (Phys. 2A-B-D* preferably, or Phys. 1A-B-C, or Phys. 3A-B-C-D) or equivalent.
3. Calculus through Math. 2D (Differential equations).

Transfer students should take particular note of these requirements. Chem. 5A can serve as an introduction to chemistry for students whose preparation in mathematics and chemistry is insufficient for Chem. 6A. Upon completion of Chem. 5A and an appropriate mathematics course, students can then enter the Chem. 6 sequence.

*Phys. 2C is not required.

Upper-Division Requirements

Except as noted below for special concentrators, the department's requirements are:

- One year of physical chemistry (130, 131, 132)
- One year of organic chemistry (141A, 141B, 141C)
- Two quarters of inorganic chemistry (120A, 120B)
- Four lab courses: 143A, 143B, 105A and one of the following (143C or 105B, or 112).
- Five additional upper-division or graduate courses in chemistry or related areas.

At least four of these courses must be other than 195 and 199.

The minimum passing grade in these courses is a D, and a minimum of a C 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. Substitution for these requirements may be made by students wishing to concentrate in biochemistry, earth sciences, or chemical physics as spelled out below.

MAJOR PROGRAM IN CHEMISTRY

Junior and Senior Year Requirements:

At least three of the following sequences should be completed by the end of the Junior year.

FALL	WINTER	SPRING
Chem. 141A*	Chem. 141B*	Chem. 141C*
Chem. 130**	Chem. 131**	Chem. 132**
Chem. 143A	Chem. 143B	Advanced Lab***
Chem. 120A	Chem. 120B	
	Chem. 105A	

Five additional upper-division or graduate courses in chemistry or related areas.† If necessary, consult with an adviser assigned in the student affairs office of the Department of Chemistry regarding choices.

*Organic Chemistry may be taken during the sophomore year by students who have completed General Chemistry in the freshman year.

**Chemistry majors must take Chem. 130, 131, and 132 except in the biochemistry concentration which does not require Chem. 130. NOTE: Students may not receive credit for both Chem. 128 and 131 or for both 126 and 131 or for both 127 and 132.

***Either Chem. 105B or Chem. 143C or Chem. 112. Students should note that the prerequisites for these courses are strictly enforced.

†Premedical students are advised to take Biol. 131 (Genetics) in the fall of the junior year and two additional upper-division biology courses.

Biochemistry

The following program is designed for those wishing to major in chemistry, but with an emphasis on biochemistry and with the options indicated, it is suitable for premedical students. 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 other courses in biology and chemistry. A minimum amount of organic, physical, and inorganic chemistry is necessary.

The complete upper-division requirements are:

1. Two quarters of physical chemistry (Chem. 131, 132).
2. Three quarters of organic chemistry (Chem. 141A-B-C).
3. One quarter of inorganic chemistry (Chem. 120A).
4. Three quarters of biochemistry (Chem. 114A-B-C).
5. Four laboratory courses (143A-B, 105A and one of the following: Chem. 112, 143C or 105B).
6. Four additional elective courses 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, 115, 121, 122, 124, 131, 136, 141, 143, 151, 153, 156.

Chem. 199 may not be used as a required or elective course, or to satisfy any course requirements 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 prior petition since no petitions after the fact can be granted. The following schedule is only an example.

Major Program in Chemistry for Biochemistry Concentrators (Typical Program)

FALL	WINTER	SPRING
Sophomore year		
At least two of the required three quarters of organic chemistry		
Junior Year*		
Chem. 114A	Chem. 114B	Chem. 114C
Chem. 143A	Chem. 143B	Chem. 112
	Chem. 131	Chem. 132
Senior Year		
Chem. 113**	Chem. 116**	Chem. 117**
Chem. 120A	Chem. 105A	Chem. 121**

*Premedical students are advised also to take three upper-division biology courses in their junior year. These may be from the list above and count as electives in place of ** courses and should include Biol. 131 (Genetics) in the junior year.

**Elective courses.

Chemical Physics

Chemical physics is that branch of physical science that applies the concepts and quantitative methods of physics to the description of atoms and molecules, analyzes matter as a statistical assembly of molecular building blocks, and develops and exploits physical (largely spectroscopic) experimental tools with which to test and refine such theories.

The chemical physics specialization 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 2E (or equivalents of these) by the end of the sophomore year. Chem. 141C is not required. Required upper-division electives are Math. 110, Phys. 110A, 110B or 100A, 100B, and Chem. 133 or 135, plus two additional courses in physical chemistry or related courses as approved by an adviser.

Major Program in Chemistry for Chemical Physics Concentrators (Typical Program)

FALL	WINTER	SPRING
Junior Year		
Chem. 130	Chem. 131	Chem. 132
Chem. 141A	Chem. 141B	
Phys. 110A	Phys. 110B	Math. 110
or 100A	or 100B	Chem. 143C
Chem. 143A	Chem. 105A	Chem. 105B

Senior Year		
Chem. 120A	Chem. 120B	Chem. 135**
Chem. 102A	Math. 120A	Math. 120B

*Substituted for Chem. 143B

**In place of or in addition to Chem. 135, Chem. 133 can be taken during the fall quarter of the senior year

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.

Normally the student does course work for a major in chemistry, physics or mathematics plus additional enrichment courses in geology. The specifically required courses are: ES 101 Introduction to Earth Sciences; ES 103 Introduction to Geophysics; ES 102 Introduction to Geochemistry; ES 120 Mineralogy; and SIO 253 A Igneous and Metamorphic Petrology. At least two other earth sciences courses will be taken. See below. Field geology (SIO 256A) is essential for geology students. It 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 following sequences — beginning in the junior year: ES 101 may be taken by sophomores who have had the equivalent of one year of college level chemistry, math and physics *if* space is available.

Major Program in Chemistry for Earth Science Concentrators

FALL	WINTER	SPRING
Junior Year		
ES 101	ES 103	ES 102
Chem. 130	Chem. 131	Chem. 132
Chem. 141A	Chem. 141B	ES 120
Chem. 143A(1/2)	Chem. 105A(1/2)	Chem. 105B(1/2)
Senior Year		
Chem. 120A	Chem. 120B	
SIO 253A		

*Two other courses are required and may be chosen from the following: SIO 244, 245A, 245B, 256A, Chem. 120C, Chem. 170, Chem. 171, Chem. 272.

MINOR PROGRAMS IN CHEMISTRY

The requirements for a minor in chemistry vary slightly with the college. Details can be obtained from the college academic advisers or from the Department of Chemistry Student Affairs Office.

The lower-division requirements for a minor in chemistry from Warren College are one full course in general chemistry (Chem. 6A-B-C or Chem. 7A-B or equivalent) and one quarter of chemistry labora-

tory (Chem. 8AL or equivalent). For upper-division requirements inquire at the Warren College Provost's Office or at the Department of Chemistry Student Affairs Office.

The Graduate Program

The department accepts students for study toward the Ph.D. The department usually recommends financial support for students who are seeking the Ph.D. 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.

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: physical, organic, and inorganic chemistry. 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. Physical chemists will be expected to present the equivalent of two years of physics, and mathematics at least through integral calculus. The appropriate background courses in biology or geology are highly desirable for students interested in biochemistry and geochemistry, respectively, but will sometimes be taken after arrival.

In the first year the student will usually take several of the graduate courses listed below, including Chem. 250. The student may also take upper-division undergraduate courses. Depending on the student's special interests, he or she may also take courses in other departments. The student will normally select a thesis adviser by the end of the first year of study and begin thesis research. 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.

Students whose native language is not English must submit TOEFL scores. There is no foreign-language requirement, but it is recommended very strongly that a student acquire at least a reading knowledge of one foreign language, preferably German or Russian.

The oral qualifying examination for admission to candidacy must be taken before the end of the fifth quarter of graduate study and will be conducted as follows:

The candidate will present a major and a minor presentation, the former consisting of a statement summarizing an original research problem. The candidate should be prepared to discuss both the theory and the experimental techniques involved, as well as the significance of the proposition and its relation to previous knowledge. The minor presentation consists of a critical analysis of one or more recent research papers assigned by the chairperson of the doctoral committee.

Successful passing of the 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.

Every graduate student is required to perform half-time teaching for two quarters in the first year of residence and one quarter out of every three quarters of residence thereafter. Course credit may be 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. Opportunities and facilities are thus available to the graduate student for study or collaboration in a wide variety of interdisciplinary fields.

GRADUATE PROGRAM IN BIOCHEMISTRY

The Department of Chemistry offers a major program in biochemistry in cooperation with the Department of Biology. Please refer to the biochemistry listing in this catalog for details.

JOINT DOCTORAL PROGRAM WITH SAN DIEGO STATE UNIVERSITY

The Department of Chemistry at UC San Diego 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.

An applicant must first be admitted to regular graduate standing at the Uni-

versity of California, San Diego and then can apply for classified graduate standing in the Graduate Division of San Diego State University. In seeking admission to the two graduate divisions, the applicant must pay all fees required by each institution and comply with the admission procedures stated in this catalog and 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 discussed in "The Graduate Program" section except that joint doctoral students do not participate in the rotation program, and one quarter of teaching is required during the first year of residence at UC San Diego.

Courses

Lower Division

5A. Introductory Chemistry (4)

Chemistry 5A-B is a two-quarter sequence designed primarily for non-science majors. Science majors with insufficient preparation for the Chemistry 6 sequence may take Chemistry 5A and then proceed to Chemistry 6A. Topics include stoichiometry, kinetic theory, equilibrium constants, atomic structure, and chemical bonding. Three hours' lecture, one hour recitation. *Prerequisite: Math. 4C or Math. 1A (may be taken concurrently).* (F,W)

5B. Introductory Chemistry (4)

Second quarter of a two-quarter sequence designed primarily for non-science majors. Topics include thermodynamics, chemical equilibria, ionic equilibria, and chemical kinetics. Three hours' lecture, one hour recitation. *Prerequisites: Chem. 5A, Math. 1A or Math. 1B (may be taken concurrently).* (W,S)

5BL. Chemistry Laboratory (1)

A laboratory course designed to demonstrate chemical concepts and to acquaint students with simple laboratory techniques. One three hour laboratory. Credit may not be received for both 5BL and 8AL. *Prerequisite: Chem. 5A or equivalent.* (W,S)

6A. General Chemistry (4)

First quarter of a three-quarter sequence intended for science and engineering majors. Topics include: stoichiometry, kinetic theory of gases, liquids and solids, equilibrium constants, ionic equilibria. Three hours' lecture, one hour recitation. *Prerequisites: proficiency in high school chemistry or physics and in high school mathematics, Math. 2A or Math. 1B (may be taken concurrently).* (F,W)

6B. General Chemistry (4)

Second quarter of a three-quarter sequence intended for science and engineering majors. Topics include: thermodynamics, chemical equilibria, chemical kinetics, quantum theory and atomic structure. Three hours' lecture, one hour recitation. *Prerequisites: Chem. 6A, Math. 2B or Math. 1C (may be taken concurrently).* (W,S)

6C. General Chemistry (4)

Third quarter of a three-quarter sequence intended for science and engineering majors. Topics include: chemical bonding, chemistry of representative elements, introduction to organic and biochemistry. Three hours' lecture, one hour recitation. *Prerequisites: Chem. 6B, Math. 1C (completed) or Math. 2C (may be taken concurrently).* (F,S)

7A. General Chemistry (4)

First quarter of a two-quarter sequence for science and engineering majors with strong preparation in physics and mathematics. Topics include: kinetic theory of gases, liquids and solids, equilibria, chemical kinetics, electronic structure of atoms. Three hours' lecture, one hour recitation. *Prerequisites: Phys. 2A, 2B and 2D or Phys. 3A, 3D, Math. 2C (Math. 2D strongly recommended).* (W)

7B. General Chemistry (4)

Second quarter of a two-quarter sequence for science and engineering majors with strong preparation in physics and mathematics. Topics include: thermodynamics and equilibria, chemical bonding, chemistry of representative elements and of transition metals. Three hours' lecture, one hour recitation. *Prerequisite: Chem. 7A.* (S)

8AL. Quantitative Chemical Analysis (2)

A laboratory course that introduces the student to laboratory techniques, analytical procedures, and physical measurements. The course includes gravimetric, volumetric, and instrumental methods of chemical analysis with emphasis on accuracy and precision. One hour lecture and two three hour laboratories. Registration is usually concurrent with registration in Chem. 6B or in Chem. 7A. Credit may not be received for both 5BL and 8AL. (W,S)

8BL. Quantitative Chemical Analysis (2)

A continuation of Chemistry 8AL. One hour lecture and two three-hour laboratories. Registration is usually concurrent with registration in Chem. 6C or in Chem. 7B. *Prerequisite: Chem. 8AL.* (F,S)

Upper Division

100A-B. Molecular Quantum Mechanics (4-4)

Molecular structure, spectra, and properties are derived from the basic concepts and techniques of quantum mechanics. *Prerequisite: Chem. 130. Chem. 190 is helpful.* (W,S)

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. 130 or 131 or 126 or 128.* (F,W,S)

105B. Physical Chemistry Laboratory (2)

Laboratory course in experimental physical chemistry. *Prerequisites: Chem. 105A and 130.* (S)

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. 131, 126, 141B, or equivalent.* (W)

112. Molecular Biochemistry Laboratory (4)

The application of techniques including electrophoresis, peptide mapping and sequencing, affinity chromatography, amino acid analysis, gas-liquid chromatography, and enzyme kinetics, to the study of the chemistry of protein structure and function and the chemistry of lipids, carbohydrates, and nucleic acids. *Prerequisites: Chem. 141A, B, and C, 143A-B, 114A, and 114B (Some of these courses may be taken concurrently).* (S)

113. Chemistry of Biological Macromolecules (4)

A quantitative discussion of the structure of biologically important macromolecules and the techniques used in their study. *Prerequisites: organic chemistry, biochemistry, and at least two quarters of upper-division physical chemistry.* (F)

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, carbohydrate, purines, pyrimidines, proteins, nucleic acids. *Prerequisite: Chem. 114A.* (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.* (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.* (S)

120A. Inorganic Chemistry (4)

The chemistry of the elements is presented in terms of the unifying concepts of atomic structure, thermodynamic, spectral, and magnetic criteria for structure and occurrence of compounds are discussed, with emphasis on ionic materials. Chemical group theory is introduced. *Prerequisite: a general chemistry course.* (F)

120B. Inorganic Chemistry (4)

A continuation of a discussion of structure and bonding of chemical compounds with an emphasis on covalent materials. Thermodynamic and spectral information are used to examine the properties and reactivities of molecules. *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)

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, introductory biochemistry.* (W)

126. Physical Chemistry (4)

Thermodynamics, chemical equilibrium, phase equilibrium, chemistry of solutions, and physical chemistry of biological systems. *Prerequisites: general chemistry, Math. 2C or consent of instructor.* (NOTE: Students may not receive credit for both 126 and 128 or 126 and 131.) (W)

127. Physical Chemistry (4)

Chemical statistics, kinetic theory, reaction kinetics and physical chemistry of biological systems. Students may not receive credit for 127 and 132. *Prerequisites: Chem. 126, Math. 2C, or consent of instructor.* (S)

128. Physical Chemistry of Biological Systems (4)

Elementary principles of thermodynamics and chemical kinetics and their application to equilibria reaction mechanisms and other aspects of biological systems. Chemistry majors cannot use Chem. 128/Biol. 134 as one of the five chemistry electives (because of overlap of material with Chem. 131-132). *Prerequisite: Math. 2C or Math. 1C.* (F)

130. Physical Chemistry (4)

Quantum mechanics, atomic and molecular spectroscopy, molecular structure. *Prerequisites: Chem. 7B or Chem. 6C, Math. 2C and 2D, 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 128 and 131, or 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.* (F)

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.* (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).* (W,S)

141A-B-C. Organic Chemistry (4-4-4)

Lectures in organic chemistry for students majoring in chemistry. The lectures will be concerned with (1) structure and properties of covalent molecules, (2) classification of reactions of first-row elements, and properties of covalent molecules, (3) reactions of organic compounds, with an introduction to biochemistry. Credit is not given for both Chemistry 141B,C and Chemistry 140A,B, or the equivalent. *Prerequisite: Phys. 2A-B-D, or Phys. 1A-B-C, General Chemistry, Biol. 1.* (F,W,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, 141A, or 141A-B-C.* (W)

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. *Prerequisite: 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 Chemistry Laboratory (4)

Identification of unknown organic compounds by a combination of chemical and physical techniques. *Prerequisites: Chem. 143A, 141C (may be taken concurrently).* (S)

145. Structures 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 simple molecular orbital theory, bond lengths, bond energies, dipole moments, ionization potentials, infrared and ultraviolet spectra, nuclear magnetic resonance and electron spin resonance. *Prerequisites: Chem. 130, 141B.* (W)

146. Kinetics and Mechanism of Organic Reactions (4)

Methodology of mechanistic organic chemistry, integration of rate expressions, determination of rate constants, transition state theory, catalysis, kinetic orders, isotope effects, substituent effects, solvent effects, linear free energy relationships, product studies, stereochemistry, reactive intermediates, rapid reactions. *Prerequisites: Chem. 132, 141C, or equivalent.* (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.* (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.* (F)

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.*

154. Clinical Chemistry (4)

Introduction to the principles and techniques utilized in the chemical analysis of body fluids for diagnostic purposes. Special emphasis will be given to diagnostic enzymology and automated instrumental analysis. *Prerequisite: organic chemistry or elementary biochemistry.* (S)

167. Biochemistry of Lipid Diseases (3)

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. (S)

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.* (W)

171. Nuclear and Radiochemistry (4)

Radioactive decay, stability systematics, neutron activation, nuclear reactions, Szilard-Chambers reactions, hot-atom chemistry, radiation chemistry, effects of ionizing radiation. *Prerequisite: general chemistry sequence.* (S)

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. *Prerequisite: one year of calculus.*

195. Chemistry Instruction (0-4)

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 senior 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.) *Prerequisites: Chem. 132, 141C, consent of instructor.* (F,W,S)

199. Senior Reading and Research (2-4)

Independent literature or laboratory research by arrangement with, and under the direction of, a member of the Department of Chemistry faculty. Students must register on a P-NP basis. *Prerequisite: consent of instructor and department.* (F,W,S)

Graduate

200A-B. Molecular Quantum Mechanics (3-3)

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 such as that provided in a physical chemistry course, for example Chem. 130. A good background in mathematics is helpful, for example Chem. 190.* (W,S)

202A. Thermodynamics (3)

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)

Chemistry

206. Topics in Biophysics and Physical Biochemistry (3)

Application of physical methods to biochemistry, e.g., x-ray diffraction, optical rotatory dispersion and circular dichroism, magnetic resonance. Same as Physics 206. *Prerequisite:* consent of instructor. (S/U grades permitted.) (W)

207. Synthetic Macromolecules (3)

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. 131 and 141B or equivalent. (W)

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. (F,W,S)

210. Seminar in Biochemistry (1)

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 evaluation, 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. (F,W,S)

211. Biochemistry I (5)

A comprehensive course in biochemistry including structural, metabolic, and human biochemistry. *Prerequisites:* physical and organic chemistry; graduate-student standing. (F)

213. Chemistry of Macromolecules (3)

A quantitative discussion of the structure of biologically important macromolecules and the techniques used in their study. *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. (F)

216. Chemistry of Enzyme Catalyzed Reactions (3)

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. Human Biochemistry (4)

An advanced course in biochemistry primarily dealing with the molecular basis of human disorders. *Prerequisite:* Elementary Biochemistry. (S)

218. Biochemistry II (3)

Advanced topics and recent advances in biochemistry for students already familiar with the subject matter of elementary courses. *Prerequisites:* physical and organic chemistry and Chem. 211 or equivalent. (F)

219A-B-C. Special Topics in Biochemistry (3-3-3)

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 (3)

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. (W)

221. Energy Transduction. (3)

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 (3)

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. (W)

225. Topics in Inorganic and Cosmochemistry (3)

An inorganic-cosmochemistry sequence which integrates modern inorganic chemistry, cosmochemistry, and current research topics and approaches in these fields. A specific group of elements is the basis for discussions of a broad range of research areas, such as abundances and origin of the elements, chronologies, solid state properties, electronic structure, catalysts and aqueous chemistry. *Prerequisite:* graduate standing or consent of instructor. (F)

227. Seminar In Inorganic Chemistry (2)

Seminars presented by faculty and students on topics of current interest, 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 a different topic will be discussed. *Prerequisite:* graduate standing or consent of instructor. (S/U grades only.) (F,W,S)

229. Special Topics In Inorganic Chemistry (1-3)

242. Natural Products Chemistry (3)

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, 141A, or 141A-B-C. (W)

244. Synthesis of Complex Molecules (3)

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. (W)

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 (3)

Methodology of mechanistic organic chemistry; integration of rate expressions, determination of rate constants, transition state theory; catalysis, kinetic orders; isotope effects, substituent effects, solvent effects, linear free energy relationships, product studies, stereochemistry; reactive intermediates; rapid reactions.

247. Mechanisms of Organic Reactions (3)

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 (3)

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. (F)

249. Special Topics in Organic Chemistry (1-3)

250. Seminar in Chemistry (1)

Regularly scheduled seminars by first-year graduate students provide opportunities for practice in seminar delivery and for the exploration of topics of general interest. (F,S)

251. Research Conference (1)

Group discussion of research activities and progress of the group members. *Prerequisite:* consent of instructor. (S/U grades permitted.) (F,W,S)

267. Biochemistry of Lipid and Lipoprotein Diseases (2)

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. (S)

268. Biochemistry of Neoplastic Diseases (3)

Special emphasis will be placed on basic aspects of chemo- and immuno-therapy, mechanism of action of anticancer agents, rational and empirical approaches to the inhibition of malignant cells. Theories relating to viral and chemical carcinogenesis will be discussed. *Prerequisite:* introductory biochemistry. (S)

269. Biological and Biochemical Approaches to Cancer (2)

Invited speakers from outside the university as well as from the university will present lectures on current topics in the biology and chemistry of cancer; a separate session will be held weekly in which the instructor will meet with the students to discuss the significance and contents of the lecturer's talk. *Prerequisite:* biochemistry or molecular-biology course. (W)

272. Nuclear and Cosmochemistry (3)

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:* Chem. 200A or consent of instructor.

277. Clinical Correlates (2)

Clinical correlates will stress the close ties between clinical medicine and the basic sciences and the two-way interactions among practicing doctors and research scientists. Most sessions will start with the presentation of a clinical case by an attending practitioner and an analysis by the clinician of the basic principles demonstrated by each case. There will follow an extended period of open discussion between basic scientists, clinicians, and students. *Prerequisites:* graduate-student standing, Chem. 211, 217, Biol. 251, 252, 253, 254 all of which may be taken concurrently. (S/U grades only.)

294. Organic Chemistry Seminar (2)

Formal seminars or informal puzzle sessions on topics of current interest in organic chemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite:* advanced graduate-student standing. (S/U grades only.) (F,W,S)

295. Biochemistry Seminar (2)

Formal seminars or informal puzzle sessions on topics of current interest in biochemistry, as presented by visiting lecturers, local researchers, or students. *Prerequisite:* advanced graduate-student standing. (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. (F,W,S)

298. Special Study in Chemistry (1-3)

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 three units per quarter. (F,W,S)

299. Research in Chemistry (1-12)

Prerequisites: graduate standing and consent of instructor. (S/U grades permitted.) (F,W,S)

500. Teaching in Chemistry (4)

A doctoral student in chemistry is required to teach a four-unit course (50 percent teaching assistantship) two quarters out of three in his or her first year of residence and one out of every three quarters in each succeeding year of residence up to a total of five quarters. This is an introduction to teaching elementary college chemistry. Each student will be responsible for, and teach a class section from one of the undergraduate chemistry courses. One meeting per week with instructor, one or two meetings per week with assigned class sections, 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 LITERATURE

See Literature

CHICANO STUDIES

OFFICE: 2072 Humanities and Social Sciences Building, Muir College

Director:

Ricardo Romo, Ph.D.

Faculty:

Carlos Blanco, Ph.D. (*Professor of Literature and Third World Studies*)

Jorge Fortes, Ph.D. (*Assistant Professor of Biology*)

Jorge Huerta, Ph.D. (*Assistant Professor of Drama*)

Claudio Fenner-Lopez, M.F.A. (*Lecturer in Communications*)

Miguel Monteon, Ph.D. (*Assistant Professor of History*)

Ramon Piñon, Ph.D. (*Assistant Professor of Biology*)

Ricardo Romo, Ph.D. (*Assistant Professor of History*)

Rosaura Sanchez, Ph.D. (*Assistant Professor of Literature and Third World Studies*)

Marta Sanchez, Ph.D. (*Assistant Professor of Literature and Third World Studies*)

Faustina Solis, Ph.D. (*Associate Professor of Community Medicine and Urban and Rural Studies*)

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 UC San Diego 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.

The exact requirements for the major will vary with the disciplinary emphasis, but in every case the number of required upper-division courses will total at least thirteen. These courses will fall into three categories:

1. core disciplinary courses (i.e., basic departmental requirements);

2. Chicano focus courses within the discipline or department. (For example: Sociology 115: The Mexican-American Family);
3. Chicano focus courses in *other* disciplines. (For example: Chicano literature courses if the major is in Chicano studies/history.)

Since the specific departmental requirements (history, literature, sociology, political science) vary with each department, prospective majors should consult with the administration of the Chicano Studies Program.

The program is administered by Mr. Ricardo Romo and a committee composed of students and faculty.

Courses

15. Introduction to Contemporary Chicano Theatre (4)

A study of the history and growth of Chicano theatre, focusing on contemporary Chicano teatros and playwrights

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.*

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 exerting a critical analysis of the societal context in which "La Raza" has sought to maintain and develop its culture. *Prerequisite: consent of instructor. (W)*

136. The Chicano Community (4)

Origins of the Mexican-American immigrant in rural Mexico; context of contact, patterns of settlement in the United States; the Mexican community, social structure and social change; acculturation and generational patterns; community leadership and change. *Prerequisites: Sociology 1A-B, Sociology, 2 or consent of instructor. (W)*

142. Chicano Dramatic Literature (4)

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 Drama 15 recommended.*

143. Spanish Language in America: Spanish Dialects (4)

A sociolinguistic study of the popular dialects in the USA 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 Southwestern dialects.

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. (W)*

155A. Social and Economic History of the Southwest (4)

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. (F)

155B. Social and Economic History of the Southwest (4)

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. (F)

155Q. Colloquium 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. *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)*

CHINESE STUDIES

OFFICE: 5053 Humanities and Social Sciences Building, Muir College

Professors:

Thomas A. Metzger, Ph.D. (*History*)

Wai-Lim Yip, Ph.D. (*Literature*)

Associate Professors:

Matthew Y. Chen, Ph.D. (*Linguistics*)

David K. Jordan, Ph.D. (*Anthropology*)

Paul G. Pickowicz, Ph.D. (*History*)
(*Chairman*)

Assistant Professors:

Richard P. Madsen, Ph.D. (*Sociology*)

Susan L. Shirk, Ph.D. (*Political Science*)

William S. Tay, Ph.D. (*Literature*)

Yen Lu Wong, M.A. (*Drama*)

Lecturer:

Ping C. Hu, M.A., (*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 and the language program, the Program in Chinese Studies offers a few courses directly under its own auspices to round out the available offerings.

UC San Diego boasts a particularly strong concentration of scholars of contemporary China. For this reason this is one of the strongest undergraduate programs on modern Chinese society now available. But the student with interests primarily in earlier periods can also be served by this program. In addition, the University of California Education Abroad Program maintains a center in Hong

Chinese Studies

Kong, providing the possibility of a junior year abroad, including both language courses and courses dealing with various aspects of Chinese studies. EAP credits may be transferred back to UC San Diego to coordinate with on-campus offerings.

UC San Diego has also arranged formal academic exchange programs with Chongqing University, Huazhong Institute of Technology (Wuhan), and Jiaotong University (Shanghai) in the People's Republic of China.

The Major Program

The student choosing a major in Chinese studies must meet the following requirements:

1. Two years of Mandarin Chinese (Lang/Ch 61, 62, 63 & 64, 65, 66 or equivalent).
2. Twelve upper-division courses in Chinese studies, including courses taken in at least three departments.
3. Successful completion of a bachelor's thesis.

In principle, the courses included in the Program in Chinese Studies are those campus offerings dealing with China or the Chinese language. A small number of courses are offered by the Chinese studies program itself. Most of the courses listed below are planned by participating departments for the 1980-81 academic year.

The bachelor's thesis must be developed in consultation with a supervising faculty member who is a member of the faculty of the Program in Chinese Studies. To provide time for this writing, the student may (but its not required to) take Chinese Studies 196, Directed Thesis Research, as one of twelve upper-division courses. It is highly desirable for the student to select the faculty member early for help in selecting courses that provide adequate background to the general area of the eventual thesis topic. The completed thesis must be submitted to the chairperson of the program at least one full quarter before the student graduates for evaluation by a committee of two other members of the Chinese studies faculty, appointed by the chairperson. The thesis will be evaluated as unsatisfactory, satisfactory, or excellent. If excellent, it will also be evaluated together with the rest of the student's academic record and may provide the basis for academic honors. If unsatisfactory, it will be returned to the student with a detailed account of the reasons and with the request that it be rewritten.

The Minor Program

A minor in Chinese studies consists of six courses (No more than three lower-division) approved by a college.

Courses

Committee-Sponsored Courses

1A-B-C. Chinese Studies (4-4-4)

This lower-division sequence provides a basic introduction to the study of Chinese society, including social structure, history, religion, literature, aesthetics, the structure of the Chinese language, and the fundamental institutions of imperial and contemporary China.

A—A description and interpretation of the major institutions and culture patterns of traditional China. Special emphasis will be placed on traditional Chinese religion and Chinese personality patterns. Staff (Not offered in 1980-81.)

B—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. Staff (Not offered in 1980-81.)

C—This course examines the major dimensions of social, economic, political, and cultural change in the People's Republic of China. Topics to be discussed include: transformation of Chinese class structure; operation of the Communist Party, state, and military organizations; creation of strategies for economic development; building of new forms of community life and collective endeavor; and development and transmission of new forms of culture. Staff (Not offered in 1980-81.)

Upper Division

163. Introduction to Chinese Linguistics (2)

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.

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:* Lang/Ch 66 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.)

Upper-Division Chinese Studies Courses Available in 1980-81

For description of courses listed below, see appropriate departmental listing.

I. CONTEMPORARY CHINESE SOCIETY

- Anthropology 103: Problems in Chinese Ethnology (Jordan)
Political Science 132: Politics in the People's Republic of China (Shirk)
Political Science 134: Seminar — Chinese Politics (Shirk)
History 184: History of the People's Republic of China (Pickowicz)
Sociology 145: Chinese Society (Madsen)

II. LANGUAGE, THOUGHT, AND SOCIETY

- Chinese Studies 163: Introduction to Chinese Linguistics (M. Chen)
Chinese Studies 181A, 181B: Introduction to Classical Chinese (Metzger)
Chinese Studies 183: Readings in Classical Chinese (Metzger)
History 186Q: Self and Society in Modern Chinese History (Metzger)
History 189Q: Special Topics in Modern Chinese History (Pickowicz)
Language/Chinese 167, 168, 169: Advanced Chinese (Hu)
Linguistics 164: Language Structures (M. Chen)
Literature/Chinese 101: Readings in Contemporary Chinese Literature (Yip)
Literature/General 150: Chinese Literature in Translation (Yip)
Literature/General 150: Classical Chinese Fiction (Tay)
Literature/General 150: Modern Chinese Fiction (Tay)
Literature/General 150: Communist Chinese Fiction (Tay)

III. MODERN CHINESE HISTORY

- History 182: History of the Modern Chinese Revolution: 1800-1900 (Pickowicz) (Not offered in 1980-81.)
History 183: History of the Modern Chinese Revolution: 1911-1949 (Pickowicz)
History 188: Peasant Revolution: Modern China (Pickowicz) (Not offered in 1980-81.)

IV. PREMODERN CHINESE HISTORY

- Chinese Studies 170: History of Science in China (J. Chen)

- History 181A: The History of Chinese Thought and Society: The Ancient Imperial Period (Metzger)
 History 181B: The History of Chinese Thought and Society: The Middle Imperial Period (Metzger)
 History 181C: The History of Chinese Thought and Society: The Late Imperial Period (Metzger)

CLASSICAL STUDIES

OFFICE: 4072 Humanities and Social Sciences Building, Muir College (Department of History)

Professor:

Edward N. Lee, Ph.D. (*Philosophy*)

Associate Professors:

Georgios H. Anagnostopoulos, Ph.D. (*Philosophy*)

Page Ann duBois, Ph.D. (*Classical and Comparative Literature*)
(*Chairwoman*)

David K. Crowne, Ph.D. (*English, Comparative Literature*)

Alden A. Mosshammer, Ph.D. (*History*)
 Sheldon Nodelman, Ph.D. (*Visual Arts*)

Assistant Professors:

William Fitzgerald, Ph.D. (*Classical and Comparative Literature*)

Richard E. Friedman, Ph.D. (*Hebrew and Comparative Literature*)

Lecturer:

Lawrence Waddy, M.A. (*Classical Languages, Literature*)

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 departments.

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. The Greco-Roman World (4-4-4)

An introductory study of the Greco-Roman world, its literature, myth, philosophy, history, and art.

Humanities 11A-B-C. The Western Tradition (6-6-6)

Visual Arts 11. Prehistoric and Ancient Art. (4)

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*

History 100. The Ancient Near East and Israel (4)

(Not offered in 1980-81)

History 101A-B. Greece in the Classical Age (4-4)

History 101Q. Special Topics in Greek History (4)

History 102A-B. The Roman Republic and Empire (4-4)

History 102Q. Special Topics in Roman History (4)

History 199. Independent Study in Greek and Roman History

Lit/Gr 1. Elementary Greek (4)

Lit/Gr 2. Intermediate Greek (4)

Prerequisite: Lit/Gr 1 or equivalent

Lit/He 1-2-3. Beginning and Intermediate Hebrew (4-4-4)

Lit/He 51-52. Readings and Interpretations (4-4)

Lit/La 1. Elementary Latin (4)

Lit/La 2. Intermediate Latin (4)

Prerequisite: Lit/La 1 or equivalent

Lit/Gr 100. Introduction to Greek Literature (4)

Prerequisite: Lit/Gr 2 or equivalent

Lit/Gr 101-102-103. Readings in Greek Literature (4-4-4)

Lit/He 100. Introduction to Hebrew Literature (4)

Lit/La 100. Introduction to Latin Literature

Prerequisite: Lit/La 2 or equivalent

Lit/La 101-102-103. Readings in Latin Literature (4-4-4)

Lit/Gen 107. New Testament Literature (4)

Lit/Gen 110. Hebrew Prophetic Literature (4)

Lit/Gen 111. Bible: The Narrative Books (4)

Lit/Gen 112. Bible: The Poetic Books (4)

Lit/Gen 115. Topics in the Prophets (4)

Lit/Gen 116. Topics in Biblical Narrative (4)

Lit/Gen 117. Topics in Biblical Poetry (4)

Lit/Gen 118. Interpreting the Bible in the Twentieth Century (4)

Lit/Gen 119. Mythology (4)

Lit/Gen 120. The Classical Tradition (4)

(May be repeated for credit as topics vary.)

Lit/He 110. Hebrew Prophetic Literature (4)

Lit/He 111. Bible: The Narrative Books (4)

Lit/He 112. Bible: The Poetic Books (4)

Lit/He 115. Topics in the Prophets (4)

Lit/He 116. Topics in Biblical Narrative (4)

Lit/He 117. Topics in Biblical Poetry (4)

Lit/He 118. Interpreting the Bible in the Twentieth Century (4)

Lit/He 190. Seminar in Biblical Studies (4)

Lit. 199. Special Studies in Greek and Roman Literature

Philosophy 101. History of Philosophy: Greek Philosophy (4)

Greek philosophy from the pre-Socratic philosophers through Plato.

Philosophy 102. History of Philosophy: Hellenistic and Roman Philosophy (4)

Greek philosophy from Aristotle to Plotinus including the major schools of Hellenistic philosophy: Stoicism, Epicureanism, Skepticism, and Neo-Platonism.

Philosophy 108. Mythology and Philosophy (4)

Study of various ancient Near Eastern mythologies in relation to Greek Philosophy.

Philosophy 199. Independent Study (4)

Visual Arts 115M. Greek Art (4)

Visual Arts 115V. Roman Art (4)

Visual Arts 115J. Late Antique Art (4)

Graduate

History 298. Directed Readings in Greek and Roman History (1-12)

Lit/Cl 210. Classical Studies (4)

Prerequisite: working knowledge of either Greek or Latin

Lit/Co 270. Ancient Literary Theory (4)

Communications

Lit/CI 297. Directed Studies in Greek or Latin Literature (1-12)

Lit/CI 298. Special Projects in Greek or Roman Literature (4)

Philosophy 201. Greek Philosophy (4)

Philosophy 202. Hellenistic and Roman Philosophy (4)

Philosophy 290. Directed Independent Study (1-4)

COMMUNICATIONS

OFFICE: 127 Media Center Communications Building, Third College

Professors:

Michael Cole, Ph.D., Coordinator
Herbert I. Schiller, Ph.D.

Assistant Professors:

Beryl Bellman, Ph.D.
Chandra Mukerji, Ph.D.

Acting Assistant Professors:

Robert G. Meadow, Ph.D.
Bruce A. Watkins, Ph.D.

Lecturers:

Claudio Fenner-Lopez, M.A.
James A. Levin, Ph.D.
Luis C. Moll, Ph.D.
Kenneth L. Traupmann, Ph.D.

Associated Faculty:

Bennett M. Berger, Ph.D., Professor
(*Sociology*)
Aaron Cicourel, Ph.D., Professor
(*Sociology*)
Roy G. D'Andrade, Ph.D., Professor
(*Anthropology*)
Abraham Dijkstra, Ph.D., Associate
Professor (*Literature*)
Bennetta Jules-Rosette, Ph.D.,
Associate Professor (*Sociology*)
Allan Kaprow, M.A., Professor, (*Visual
Arts*)
Hugh B. Mehan, Ph.D. Associate
Professor (*Sociology*)
Donald A. Norman, Ph.D., Professor
(*Psychology*)
Jehanne Teilhet, Ph.D., Lecturer with
Security of Employment (*Visual Arts*)
Don Wayne, Ph.D. Assistant Professor
(*Literature*)

The Communications Program at UC San Diego offers an interdisciplinary undergraduate social science curriculum. Its focus of study is on the ways in which the transfer and exchange of information between people shape the nature of human activity and are shaped by it. As a Third College program, Communications recognizes a special obligation to study the role of the communications media across the full range of ethnic and cultural diversity represented by our student body.

A basic goal of the curriculum is to assist students in attaining a critical awareness of the communicative forces that influence their everyday lives. This goal underlies the Communications Program's belief that students who have achieved a basic understanding of communications processes should apply that understanding to the task of shaping their social environments.

Although the basic categories of social analysis and many basic research techniques important to communications are to be found in existing social sciences disciplines, what makes communications distinctive is the focus on the ways in which interactions among individuals and social institutions are mediated by communication technologies. Consequently, a student majoring in communications will be expected to master both specific communications concepts and perspectives and more general basic social science concepts.

The Communications Program offers two campus-wide undergraduate majors: 1. Communications, and 2. Communications/Visual Arts.

The communications curriculum is structured to provide a background in, and to permit specialization in four broadly defined areas:

COMMUNICATION AS A SOCIAL FORCE

This area analyzes the dynamic interrelations between various social systems which affect and are affected by the technology, the social organization of the communication industries, and how the organization of the presentation of information through the media is related to characteristics on the intended audiences. Courses in this area are concentrated in mass media communications and address such topics as systems of propaganda, the media and voting campaigns, political economy of mass communications, and the development of communication technologies.

COMMUNICATION AND CULTURE

This area emphasizes study of the cultural forms which shape the ways that individuals, individuals within groups, organizations, and national units engage in the exchange of information. The products of our cultural traditions are also examined to discover how communication processes specifically organize

cultural and social life, e.g., study of cross-cultural communication processes and problems, ritual meanings in social settings, content of films and advertising as cultural productions, the impact of cultural belief systems on the structure of messages, and the relation between language and culture.

COMMUNICATION AND HUMAN INFORMATION PROCESSING

This area emphasizes the ways in which concepts and ideas are shaped into messages as well as the ways in which messages are received and processed by individuals. Basic concepts of human information processing are applied to the full range of media (language, writing, electronic media) to determine the special properties of message formation and reception characteristic of each. The impact of television on the individual, the way in which concepts are embodied and transmitted in film, the effect of literacy on the individual, and means by which computers can expand human communicative capacities are some examples of topics covered.

COMMUNICATIONS MEDIA

Cutting across these areas are the various media that serve as the channels of communication. A fourth area of concentration, therefore, makes possible a focus on the media, in particular the self-conscious use of media properties that permit effective communications within any of the three other areas.

The Communications Major

The communications major prepares students for graduate or professional schools in various disciplines and for career opportunities in media-related occupations. The major is not a professional training program in journalism, film, or television production.

The internship program (Comm/Gen. 197) offers undergraduates the opportunity to engage in field research and fieldwork under the guidance of individual faculty members — a unique chance to bridge the gap between communication theory and praxis.

PREREQUISITES

Students planning to major in communications will be required to fulfill a social science prerequisite. It is recommended that these courses be taken in

the freshman or sophomore year — concurrent with or prior to Comm/Gen. 20 and prior to taking 100-level courses in the program. The Communications Program requirement in social science is:

Three lower-division courses in two or more social science disciplines, one of which must be a methods course, e.g., Psych. 60, Sociol. 2. (NOTE: If an upper-division methods course such as Anthro. 112, Pol. Sci. 174A, Comm/SF 167A, or Sociol. 181 is used to satisfy this methods requirement, it may not be used as one of the fifteen courses required for the major.)

This social science requirement for communications majors may fulfill all or part of the various colleges' general-education requirements in social science. Students should plan their programs in conjunction with their college advising offices.

The communications major consists of fifteen courses: one lower-division course and fourteen upper-division courses.

Lower Division:

All students are required to take Comm/Gen. 20.

Upper Division:

Students are required to take: (1) Four Core Courses — Comm/SF 100, Comm/CC 100, Comm/HIP 100, Comm/Gen. 100; (2) One additional upper-division course from each of the three content areas; (3) One Media Methods Course; (4) Five upper-division electives; (5) One Integrative Seminar — Comm/Gen. 150.

None of the courses for the major may be taken on a Pass/No Pass basis.

The Communications/Visual Arts Major

Plans for the Communications/Visual Arts major are currently under revision. Students interested in this major should check with the Communications Program office for the major requirements.

Courses

Lower Division

GENERAL COMMUNICATION

Comm/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

Upper Division

COMMUNICATION AS A SOCIAL FORCE

(Courses numbered 101-120 are media/methods.)

Comm/SF 100. Introduction to Communication as a Social Force (4)

(Numbered 100A 1978-80; 102B prior to 1978) A critical overview of areas of macro communication 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: Comm/Gen. 20 or consent of instructor.

Comm/SF 101A. Television Analysis and Production (6)

(Numbered 111A, 111AL 1978-79; 101A, 101AL prior to 1978) 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 with the opportunity to experiment with production elements influencing the interpretation of program content. Concentration on lighting, camera movement, composition, and audio support. Prerequisites: Comm/SF 100 and Comm/Gen. 100 or consent of instructor.

Comm/SF 101B. Television Documentary (6)

(Numbered 111B, 111BL 1978-79; 101B, 101BL prior to 1978) 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: Comm/SF 101A or consent of instructor.

Comm/SF 167A-B./Pol. Sci. 174A-B. Statistical Methods/Data Analysis (4)

(Numbered 165A-B 1978-79; 174A-B prior to 1978) A general introduction to statistical methods and data analysis for students interested in political science, public policy, and communications research. Although calculus is not required, it is strongly recommended. The course includes a basic introduction to the theory and practice of statistical inference, sampling theory, measures of association, and linear regression models. Prerequisite: Comm/SF 100 or consent of instructor.

Comm/SF 168A-B./Pol. Sci. 107A-B. Voting, Campaigning, and Elections (4)

(Numbered 170A-B 1978-79; 107A-B prior to 1978) A consideration of the nature of public opinion and voting in American government. Studies of voting behavior are examined from the viewpoints of both citizens and candidates and efforts are made to develop models of electoral behavior. Attention is devoted to recent efforts to develop rational choice theories of electoral behavior and to critiques of elections as democratic institutions. The role of mass media and money is examined. Prerequisite: Comm/SF 100 or consent of instructor.

Comm/SF 169./Pol. Sci. 164. Political Consequences of Electoral Systems (4)

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, the semi-proportional systems), district size, and electoral thresholds. The effects of 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: Comm/SF 100 or consent of instructor.

Comm/SF 170./Pol. Sci. 154. Comparative Politics and Political Culture (4)

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 seminal questions around which this course will be organized. Prerequisites: Comm/SF 100 and consent of instructor.

Comm/SF 173./Sociol. 154. Sociology of Mass Media (4)

This course will be concerned primarily with the techniques and social methods of constructing the news. It will be especially concerned with the news of newspapers and television. It will also deal with how the news is constructed, the effects of their messages on the public and other important subjects, such as the effects of ownership patterns on the messages of the news media. Prerequisites: Sociol. 1A-B, 2, Comm/SF 100, or consent of instructor.

Comm/SF 174./Sociol. 105. Popular Culture (4)

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. Prerequisites: Sociol. 1A-B, Comm/SF 100, or consent of instructor.

Comm/SF 177./Pol. Sci. 178. Comparative Systems of Propaganda (4)

This course will examine the creation and dissemination of propaganda across a variety of social and political systems. Differences in system building or maintaining communication processes between variant ideologies or cultures such as East and West, socialist and capitalist, and industrialized and non-industrialized nations will be considered. Selected propaganda campaigns will be examined in detail. Prerequisite: Comm/SF 100 or consent of instructor.

Comm/SF 178. Mass Communications: Theories, Perspectives, and Methods (4)

Various sociological theories, methods, and perspectives which have been adopted in studying mass communication. What is "mass" communication? Lenin and the Frankfurt school. Labelling and the media. Party, democracy in America, and "press freedom." Park and Lippmann. Functionalism. The audience effects tradition. Uses and gratifications. Content analysis and semiology. Prerequisite: Comm/SF 100 or consent of instructor.

Comm/SF 179./Pol. Sci. 179. Mass Media and Politics (4)

This course will explore both the role played by mass media in political institutions, processes and behaviors and, reciprocally, the roles played by political systems in guiding communication processes and technologies. Four major topics will be considered: 1) mass media and political socialization; 2) news gathering and dissemination; 3) mass media in electoral politics; and 4) communication as a political issue. Prerequisite: Comm/SF 100 or consent of instructor.

Comm/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: Comm/SF 100 or consent of instructor.

Comm/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: Comm/SF 100 or consent of instructor.

Comm/SF 183. History of Communication Technologies (4)

This course will cover the development of the major mass communications technologies: printing, photography, the telephone, film, radio, and television. Each of these technological developments will be analyzed in terms of broader patterns of technological innovation in their respective periods of history. Applications of the technologies will be analyzed in terms of more general patterns of organizational change that have accompanied other introductions of new technologies into the work place. Finally, uses of these technologies will be analyzed for the changes in patterns of communication that they create. Prerequisite: Comm/SF 100 or consent of instructor.

Communications

Comm/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:* Comm SF 100 or consent of instructor.

Comm/SF 186. Film Industry (4)

A study of the social organization of the film industry throughout its history, addressing such questions as who makes films, by what criteria, and for what audience. The changing relationships between studios, producers, directors, writers, actors, editors, censors, distributors, audience, and subject matter of the films will be explored. *Prerequisite:* Comm SF 100 or consent of instructor.

Comm/SF 189. Radio and Society (4)

The social and technological constraints and freedoms of sound broadcasting in the United States. Contrastive analysis of radio communications systems abroad and an examination of radio's potential as a community-oriented system. *Prerequisite:* Comm SF 100 or consent of instructor.

COMMUNICATION AND CULTURE

(Courses numbered 101-120 are media/methods.)

Comm/CC 100. Introduction to Communication and Culture (4)

(Numbered 100B 1978-79; 102A prior to 1978) 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:* Comm/Gen. 20 or consent of instructor.

Comm/CC 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:* Comm CC 100 and Comm/Gen. 100, or consent of instructor.

Comm/CC 106. Use of Audio Visual Resources (4)

(Numbered 134 1978-79; 160 prior to 1978) Analysis of and instruction in various uses of video taping and tape recording in data collection and analysis in the study of communication and face-to-face interaction. *Prerequisites:* Comm/CC 100 and Comm/Gen. 100, or consent of instructor.

Comm/CC 107./Sociol. 163. Ethnographies: Their Uses and Analysis (4)

(Numbered 133 1978-79; 163 prior to 1978) The analysis of methods and underlying assumptions of field observation and ethnographic reporting. The contrast of various types of written and audio visual ethnographies, a critical examination of their styles, approaches, and uses as a form of sociological analysis and opportunities for their application. *Prerequisites:* Comm CC 100 and Comm/Gen. 100, or consent of instructor.

Comm/CC 108. Images of Women (4)

(Numbered 136 1978-79; 161 prior to 1978) 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 CC 100 and Comm/Gen. 100, or consent of instructor.

Comm/CC 144. Language and Society (4)

(Numbered 140 1978-79; 132 prior to 1978) 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 USA. *Prerequisite:* Comm CC 100 or consent of instructor.

Comm/CC 146./Psych. 146. Culture and Thought (4)

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:* Comm CC 100 or consent of instructor.

Comm/CC 147./Sociol. 167. Culture, Contact, and Change (4)

The analysis of patterns and problems of socio-cultural persistence and change with a special focus on the impact of the West on Third World societies. Emphasis is placed on the role of media in this process. This includes analyses of the effects of both Western and indigenous programming, types of formats used, and the local uses and interpretation of mass media. *Prerequisite:* Comm/CC 100 or consent of instructor.

Comm/CC 148. Media and the Third World (4)

The comparison and analysis of different types of media productions made by Third World and Western communicators. The effects of different symbol systems and presentation formats are examined both for their cognitive and social effects. Productions of Western communicators are contrasted with those made by members of Third World societies about themselves. Attention is given to the effects of the images that Westerners use on those cultures and their media products. *Prerequisite:* Comm CC 100 or consent of instructor.

Comm/CC 150./Anthro. 150. Culture, Communication, and Meaning (4)

An examination of "culture" in relation to anthropological data and conceptions concerning communication, pathology, and learning. *Prerequisite:* Comm/CC 100, Anthro. 22, or consent of instructor.

Comm/CC 151./Anthro. 125. Language and Culture (4)

This course explores language acquisition, idiolects, social dialects, levels of linguistic usage, language and world view, the role of language in cultural interaction and social structure, and planned language change, including language problems in new nations and at an international level. *Prerequisite:* Comm/CC 100 or consent of instructor.

Comm/CC 154./Sociol. 103. Acquisition of Communicative Competence (4)

The socialization of children is viewed as the acquisition of communicative competence including social rules and values. The cultural and linguistic knowledge involved in the acquisition of membership in various social groups is discussed. Several modalities of communication are examined including the visual, auditory, and kinesic. *Prerequisites:* Sociol. 1A-B, 2, Comm/CC 100, or consent of instructor.

Comm/CC 155./Sociol. 106. 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. *Prerequisites:* Sociol. 1A-B, 2, Comm/CC 100, or consent of instructor.

Comm/CC 157./Sociol. 117. Classroom Interaction (4)

Sociolinguistic principles are applied to the study of classroom communication. 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 classroom presentations and student projects. *Prerequisites:* Sociol. 1A-B, 2, Comm/CC 100, or consent of instructor.

Comm/CC 158./Sociol. 153. Sociology of Knowledge (4)

The analysis of political ideology and its relationship to forms of scientific thought, especially of the social sciences. The analysis of the social influences and institutions affecting the development and transmission of knowledge, including the analysis of universities, communication agencies, and markets for popular and high culture. *Prerequisites:* Sociol. 1A-B, 2, Comm/CC 100, or consent of instructor.

Comm/CC 160./Sociol. 188. Sociology of Visual Knowledge (4)

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. *Prerequisites:* Sociol. 1A-B, 2, Comm/CC 100, or consent of instructor.

Comm/CC 161./Pol. Sci. 182. Content Analysis (4)

This is a methods course designed as an introduction to content analysis: the scientific, systematic and objective employed in verbal and nonverbal message analysis. Although content analysis is used throughout the social sciences and humanities, examples will be drawn primarily for political speeches, documents, and news media. Students will engage in original content analysis research projects during the quarter. *Prerequisite:* Comm/CC 100 or consent of instructor.

COMMUNICATION AND HUMAN INFORMATION PROCESSING

(Courses numbered 101-120 are media/methods.)

Comm/HIP 100. Introduction to Communication and Human Information Processing (4)

(Numbered 100C 1979-80) 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:* Comm/Gen. 20 or consent of instructor.

Comm/HIP 110. Media Effects (4)

This course examines the unique effects of print, film, and television on human behavior and information processing. Special emphasis is given to television's effects on beginning viewers. The course will emphasize the difficulties of testing causal hypotheses about media effects on individuals. Controversies surrounding media effects will be examined from both historical and contemporary social science perspectives. *Prerequisites:* Comm/HIP 100 and Comm/Gen. 100, or consent of instructor.

Comm/HIP 111. Communicating and Computers (4)

(Numbered 155 1978-79) This course explores the effects of active computer-based media on future communications. It starts with an introduction to computers, with a focus on the interactive use of personal computers. Students will explore ways of using computers to construct active communication networks, including teleconferencing and interpersonal interaction with simulated worlds. *Prerequisites:* Comm/HIP 100 and Comm/Gen. 100, or consent of instructor.

Comm/HIP 112. Frontiers of Communication (4)

(Numbered 139 1978-79) This course will explore new communication technologies, their impact on the structure of communication, and the side effects of these likely impacts on individuals and on the society. Students will apply the analytical techniques of projection, scenario construction, and analogical comparison and simulation to determine outcomes and side effects. New technologies for transmission channels (optical fibers, communication satellites), video and digital storage (video disks), and computation (personal computers, information utilities) will be examined. *Prerequisite:* Comm/HIP 111.

Comm/HIP 113. Verbal Communications (4)

This is an advanced course in the behavioral analysis of human communication. Spoken and written communication will be analyzed in terms of their antecedents (or situations of occurrence) and on terms of their relationships to their consequences. Students will be expected to conduct and report on a research project that pertains to course material. *Prerequisites:* Comm/HIP 100 and Comm/Gen. 100, and consent of instructor.

Comm/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: Comm/HIP 100 and Comm Gen. 100, or consent of instructor.*

Comm/HIP 121. Literacy, Social Organization and the Individual (4)

This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching reading and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. *Prerequisite: Comm/HIP 100 or consent of instructor.*

Comm/HIP 122A-B. Communications 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 effect 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: Comm/HIP 100 or consent of instructor.*

Comm/HIP 123. Children and Television (4)

A lecture course which reviews the effects of television on children's behavior and thought processes. In addition, the course examines and analyzes the kinds of research studies which have looked at television's effects. Class members will participate in a variety of analyses of television content. *Prerequisite: Comm/HIP 100 or consent of instructor.*

Comm/HIP 129./Psych. 171. Disorders of Communication (4)

(Numbered 164 1978-79) This course is a survey of miscommunication, both verbal and nonverbal. It focuses on, although is not restricted to, forms of miscommunication that are labeled pathological, e.g., schizophrenia, aphasia and childhood autism. Investigation of these problems takes several perspectives: Pathological forms of communication are discussed in communications theory, cognitive and behavioral science terms. Both the situational nature of communication disorders and their development within a given individual are discussed. In addition, a socio-historical perspective is taken on the development of prevailing concepts concerning pathological forms of communication. *Prerequisite: Comm/HIP 100 or consent of instructor.*

Comm/HIP 131./Anthro. 118. Cognitive Anthropology (4)

This course will consider the relation between cultural behavior and cognitive processes. Selected topics from the fields of ethno-science, semantic and grammatical analysis, decision making, and belief systems will be discussed. *Prerequisites: Anthro. 22 and Comm/HIP 100, or consent of instructor.*

Comm/HIP 132./Anthro. 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. Video tape and other recording techniques will be employed. *Prerequisites: Anthro. 22 and Comm/HIP 100, or consent of instructor.*

Comm/HIP 135./Psych. 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. *Prerequisites: Psych. 60 and Comm/HIP 100, or consent of instructor.*

Comm/HIP 136./Psych. 105. Introduction to Cognitive Psychology (4)

Introduction to the experimental study of higher mental processes. Topics to be covered include pattern recognition, perception and comprehension of language, memory and problem solving. *Prerequisites: upper-division standing and Comm/HIP 100, or consent of instructor.*

Comm/HIP 138./Psych. 136. Cognitive Development: Piaget (4)

Intensive examination of Jean Piaget's theories of cognitive growth from birth to adolescence. Topics: development of imagery and mental representation; thought and language; concepts of space, causality and number; logical thinking. *Prerequisites: Psych. 101/Comm/HIP 135, or Psych. 105/Comm/HIP 136, or consent of instructor.*

Comm/HIP 139./Psych. 133. Psychology and Artificial Intelligence (4)

A survey of current developments in artificial intelligence as it pertains to psychology. Special attention will be given to work in automatic speech understanding, natural language processing, belief systems, problem solving and game playing. *Prerequisites: Psych. 105, Comm/HIP 136, EECS 61, or consent of instructor.*

Comm/HIP 142./Psych. 145. Psycholinguistics (4)

Presentation of the psychology of language, including its biological basis, the development in children, and its use by the adult. Of particular interest will be the question of the relevance of linguistic descriptions to psycholinguistics. *Prerequisites: Psych. 105, Comm/HIP 136 or Ling. 1 and 2, or consent of instructor.*

GENERAL COMMUNICATIONS

Comm/Gen. 100./Visual Arts 170. Introduction to Media Communications (4)

(Numbered 100E 1979-80; 100C 1978-79; 171 prior to 1978) An introductory course dealing with the theory of communications through portable video recording equipment and super 8 film. The theory of the relationship of camera to eye to viewer is explored. Experimentation is explored through laboratory experiments and projects using 1/2" videotape, 3/4" video cassettes and super 8 film. *Prerequisite: Comm/Gen. 20 or consent of instructor.*

Comm/Gen. 110. Media Methods for Communications Research (4)

(Numbered 100M 1979-80) 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. *Prerequisites: Comm/SF 100, Comm/CC 100, Comm/HIP 100 and Comm/Gen. 100, or consent of instructor.*

Comm/Gen. 115. Communications Analysis and Research (4)

(Numbered 191 1979-80; 166 1978-79; 190 1977-78) This course is designed to give students the methodological skills necessary to doing research in any area of communications. Emphasis will be given to those research questions that involve how people change as a result of communications, including change in communication itself. This course will span all three levels of analysis in communication and levels of aggregation, therefore may be taken three times. However, students repeating this course must undertake their analysis at a different level of analysis each time. *Prerequisite: Comm/Gen. 110 or consent of instructor.*

Comm/Gen. 120. Seminar: Television Research (4)

(Numbered 192 1979-80) An upper-level seminar focused on the effects of television on human behavior. Students will be expected to participate in literature review of current television research and in an on-going program of media study. May be taken three times for credit providing a different level of analysis is attempted each time. *Prerequisites: senior communications majors who have completed the core courses and consent of instructor. TV production and/or statistics courses recommended.*

Comm/Gen. 150. Integrative Seminar in Communications (4)

(Numbered 190 1979-80) 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 "sub-unit." For each sub-unit 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 communications majors who have completed the core courses.*

Comm/Gen. 193. Advanced Topics in Communications (4)

Specialized study in communications, with topic to be determined by the instructor for any given quarter. May be repeated for credit. *Prerequisites: Comm/SF 100, Comm/CC 100, and Comm/HIP 100, or consent of instructor.* (Note: Comm/Gen. 193 may be accepted in the major as an elective only by petition.)

Comm/Gen. 195. Instructional Assistance in Communications (4)

Observation and critique of classroom procedures and content. Assisting in the instruction of a lower-division undergraduate communications 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.*

Comm/Gen. 197. Field Internships in Communications (4)

Supervised experience in developing and implementing projects requiring participation and involvement in a communication media operation in the community. Projects may cover television, newspapers, radio and similar areas. May be taken three times for credit. (P/NP grades only.) *Prerequisites: Comm/SF 100, Comm/CC 100, Comm/HIP 100 and consent of instructor.*

Comm/Gen. 198. Directed Group Study in Communications (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: Comm/SF 100, Comm/CC 100, Comm/HIP 100, and consent of instructor.*

Comm/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: Comm/SF 100, Comm/CC 100, Comm/HIP 100, and consent of instructor.*

MEDIA PRODUCTION COURSES

(The following courses may only be used as electives in the major *and only by students specializing in Media Communications.*)

Comm/MP 116./Visual Arts 172. Video Studio Techniques (4)

(Numbered 125 1978-79; 173 prior to 1978) The exploration of video as a communications tool, an art form, and experimental medium. This course introduces the student to the television studio, its equipment and possibilities. Emphasis is placed on the application of video techniques in the controlled environment of a studio. *Prerequisites: Comm/Gen. 100 and consent of instructor.*

Comm/MP 118. Television as a Social Force (4)

(Numbered 115 1978-79; 101C prior to 1978) Primarily a research and production course. Students undertake the research, design, and production of a series of video taped programs that serve some pressing social need. *Prerequisites: Comm/SF 101B and consent of instructor.*

COMPARATIVE STUDIES IN LANGUAGE, SOCIETY, AND CULTURE

OFFICE: 1532 Humanities-Library Building, Revelle College

Program Directors:

George Anagnostopoulos, *Department of Philosophy*

H. Stuart Hughes, *Department of History*

Roy Harvey Pearce (Chairman), *Department of Literature*

Roger Reynolds, *Department of Music*

Melford E. Spiro, *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 UC San Diego 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 directors.

CONTEMPORARY ISSUES

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

Director:

John L. Stewart, Ph.D.

Courses

Lower Division

2. Freshman Seminars on Contemporary Issues (4)

Seminars for students of John Muir College directed by members of UC San Diego 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)

20. The Wilderness and Human Values (4)

The value and significance of the wilderness for contemporary man considered in terms of ecology, anthropology, literature, and recent history. Includes one mandatory field trip lasting several days. J. L. Stewart (S)

21. Contemporary Issues (4)

Designed as a directed "peer-group-leading" situation in which a discussion leader (who will have had a seminar with the director and consulted with a faculty adviser) will work with a group of students on an issue of contemporary concern with the purpose of learning how to analyze, research, discuss, and prepare a presentation. Lectures by the instructor and guests to the group. L. Ross

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

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 UC San Diego 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)

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

190. Culture/Personality and the Education Process (4)

Theories and societal assumptions about the teaching-learning process will be examined both from an interdisciplinary and cross-cultural perspective. Field observation techniques will be an adjunct to the lectures. L. Ross

195. Discussion Leading in Contemporary Issues (4)

Students (after preparation and training in Contemporary Issues Workshop 196) will lead groups of ten-twenty students in discussions of contemporary concern. Students will meet with the director 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.) *Prerequisites: Contemporary Issues 196 and consent of the director of Interdisciplinary Sequences.* J. L. Stewart (Offered spring quarter only)

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. Participation in the workshop does not guarantee selection as discussion leader. (Offered fall quarter 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. (P/NP grades only.) *Prerequisite: consent of instructor*

199. Special Studies in Contemporary Issues (2-4)

To be offered during fall, winter, and spring quarters. Permission of the provost of Muir College and 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)

Community Medicine 237. Contemporary Issues in Medicine (2)

Seminar concerned with research and analysis of problems of contemporary concern in the practice of medicine. Community and university resources will be used to explore such areas as forensic constraints, health cultures and subcultures, and medical ethnics. L. Ross (S)

CULTURAL TRADITIONS

OFFICE: 2024 Humanities and Social Sciences Building, Muir College

Director:

John L. Stewart, Ph.D.,

* * *

Each year several different three-course sequences are offered. The sequences are developed by a special committee. The particular cultures to be studied vary from year to year, though some, such as the Judaic culture studies, have attracted such widespread interest that they may be carried over from one year to the next. Other sequences have recently been offered in or are planned for such cultures as Asian, Latin American, Mediterranean, Black studies, Chicanos, and American Indian.

A descriptive list of the sequences offered for the coming academic year is available in time for the fall enrollment. Inquiries about the program or projected sequences should be addressed to the department.

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)

199. Special Studies in Cultural Traditions (2-4)

Individual reading and projects in the areas of cultural studies in which a particular culture will be viewed in reference to its history, arts, events, literature, music, societal structure. This course is offered under very special circumstances, e.g., a student is abroad at a time which interrupts his or her CT sequence but provides him or her a special opportunity in another culture, or an upper-division student desiring to do such a study under the personal direction of the director. *Prerequisite: consent of director.* (F.W.S)

DRAMA

OFFICE: 2550 Humanities-Library Building, Revelle College

Professors:

Michael Addison, Ph.D. (*Chairman*)
Eric Christmas, R.A.D.A.
Floyd Gaffney, Ph.D.
Alan Schneider, M.A.
Arthur Wagner, Ph.D.

Associate Professors:

Mary Corrigan, M.A.
Frantisek Deak, Ph.D.

Assistant Professors:

Jorge Huerta, Ph.D.
Robert Israel, M.F.A.
Richard Riddell, Ph.D.
James Sims, M.F.A.

Lecturer:

Luther James

* * *

The Undergraduate Program

The curriculum in the Department of Drama has been developed to provide (1) an integrated and meaningful program for those students desiring a drama major; (2) a sequence of courses to fulfill the fine arts and humanities requirements in Revelle, Muir, and Third Colleges; (3) a series of courses fulfilling Revelle and Warren College minor requirements; and (4) elective courses for the general student desiring experiences in the dramatic arts.

THE DRAMA MAJOR

The program for a drama major is designed to provide a focus of humanistic learning and to prepare those students who wish subsequently to pursue advanced study with the most solid artistic background possible within a liberal arts context. The drama major consists of nineteen courses, thirteen of which are required for all drama majors. The prescribed courses are:

Drama 30. Beginning Acting
Drama 42. Drama Survey: Tragedy
Drama 43. Drama Survey: Epic
Drama 44. Drama Survey: Comedy
Drama 70A-B-C. Theatre Production
Drama 131. The Art of Directing
Drama 189. Major Seminar

Three upper-division courses in dramatic literature/history/criticism (selected from drama courses numbered 140-149 and/or 160-169).

One drama course in Dance/Movement (Drama 120 does not apply).

Production Requirement (See below).

The remaining six required upper-division courses may be taken as upper-division electives, three of which can be taken outside the department with approval of the undergraduate adviser.

Production Requirement

All majors are required to participate in one theatre production per year. Courses which fulfill this requirement are: Drama 101, 102, 103, 104, 105, and 106. A maximum of twelve units of these courses will be counted toward graduation.

To satisfy the production requirement all majors must complete:

- (A) One four-unit production course in Scenic/Props, Costume/Make-up, or Lighting/Sound (Drama 102, 103, or 104); and
- (B) A total of four units of production work in Acting/Directing, Stage Management, or Dramaturgy (Drama 101, 105, or 106).

NOTE: As the drama program grows, there are necessary changes being developed in curriculum and theatre production modes. Students considering the drama major should be sure to consult with the departmental undergraduate adviser to determine the exact details of the major at the time.

The Graduate Program — M.F.A. in Theatre

Graduate study in drama at UC San Diego focuses upon intensive professional training in the areas of acting, directing, design, and theatre criticism. A carefully limited number of students is admitted each year after audition and interview, chosen on the basis of demonstrated professional potential. The training program is highly integrated, with all graduate students participating in the acting process studio, the graduate theatre seminar, graduate thesis projects and theatre production. In addition, students in the graduate theatre program will be expected to engage in studies in areas related to their creative work, drawing from the humanities, the social sciences, and the arts. Students successfully completing the three-year course of study will be awarded the M.F.A. degree in theatre.

Courses

NOTE: For changes in course offerings implemented after publication, inquire at the office of the Department of Drama.

Lower Division

11. Introduction to 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)

Beginning experiences in the process of acting: observation, concentration, use of objects, use of self, actions and objectives, improvisations, theatre games, preparation of scenes.

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 parallel to Drama 12, serving nonmajors as an introduction to theatre and majors as the first step in the design and production course sequence.

15. Introduction to Contemporary Chicano Theatre (4)

Continuing study of the history and growth of Chicano theatre, focusing on contemporary Chicano theatros and playwrights.

16. 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, actor. May be repeated for credit. *Prerequisite:* consent of instructor when repeated for credit.

17. Introduction to Voice for the Theatre (4)

An intensive and systematic introduction to the general principles of voice production for the theatre, this course will explore processes for freeing the natural voice, concentrating on exercises and developmental techniques that will enlarge the capacity for diaphragmatic breathing, articulation control, shaping of pitch, range, and projection. Emphasis throughout will be on the necessity for fusion of the vocal process with other elements available to the actor for character creation for the theatre.

18. Introduction to Movement for the Theatre (4)

An introduction to the wide range of physical disciplines and techniques that enable the performer to use the body as an expressive medium in the theatre. Based on the principle that ideas precede images, the course will focus on methodologies that link text, analysis and understanding, and the physical extension into shaped and expressive movement through defined space.

20A-B. Dance Fundamentals (4-4)

Exploration and analysis of dance as an expressive medium through the heightened development of physical, sensory, and rhythmic skills in workshop. Study of the history and theory of dance from primitive expression to contemporary trends in lecture.

21. Beginning Jazz Dance (4)

Basic elements of jazz dance and performance. In addition to practical exercises in principles of jazz dance forms and choreography, dance will be discussed as an aspect of culture and human behavior.

23A-B-C. Beginning Ballet (4-4-4)

An introduction to the art of the ballet, with concentration on development of techniques and exploration of formal problems.

30. Beginning 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 Drama 130A/B. *Intermediate Acting. Prerequisites:* Drama 12 and consent of instructor.

40. American Drama on Film (4)

Extensive examination of major plays from the modern American theatre that have been recorded in film or video media. Class will examine developing American dramatic themes, patterns of emerging immigrant and regional treatments of the American mythos, and the shaping of American theatre art as a unique twentieth-century cultural phenomenon. Among the plays to be considered: *Glass Menagerie*, *Desire Under the Elms*, *Long Day's Journey into Night*, *Streetcar Named Desire*, and *Petried Forest*.

Drama

42. Drama Survey: Tragedy (4)

A close examination of plays that reveal man as over-reacher, as dreamer, as self-destroyer, and as both victim and victor in the conflict with the cosmos.

43. Drama Survey: Epic (4)

The theatre as panorama, where broad-reaching human pageants reveal human collisions with man and society. *Prerequisite: sophomore standing.*

44. 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.

NOTE: Drama 42, 43, and 44 fulfill the humanities and fine arts requirements for Revelle, Muir, and Third Colleges.

70A-B-C. Theatre Production (4-4-4)

A comprehensive survey of technical production. Each quarter focuses on a different aspect of theatre production in the UCSD Theatre: lighting and sound, scenery and properties, and costume and makeup, each studied in the context of concurrent UC San Diego productions. Required for majors and a prerequisite for all upper-division design courses.

74. Basic Design for the Theatre (4)

Basic problems in design research, criticism, text analysis, and conceptualization. Beginning studies in seeing, drawing, painting, layout and model making, building a vocabulary of visual expression for theatre design, moving toward the study of costume, scenic, property, and lighting design as an integrated process.

Upper Division

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. *Prerequisite: consent of instructor.*

102. Studies in Technical Theatre (0-4)

A production/performance-oriented course exercising the fundamental techniques of scenic and properties construction, stage lighting, and sound reproduction for the theatre. Laboratory format culminating in fully mounted theatrical production. (Students may register in this course only if they have been accepted as a member of a technical crew.) *Prerequisite: consent of instructor.*

103. Studies in Costume Construction (0-4)

A production/performance-oriented course exercising the fundamental techniques of costume construction and wardrobe responsibilities for the theatre. Laboratory format culminating in fully mounted theatrical production. (Students may register in this course only if they have been accepted as a member of a costume crew.) *Prerequisite: consent of instructor.*

104. Studies in Lighting and Sound (4)

A production/performance-oriented course exercising the fundamental techniques of stage lighting and sound reproduction for the theatre. Laboratory format culminating in fully mounted theatrical production. (Students may register in this course only if they have been accepted as a member of a lighting and sound crew.)

105. Studies in Production Management (4)

A production/performance-oriented course exercising the fundamental techniques of stage management, assistant directing, and promotion for theatrical production. Laboratory format culminating in fully mounted theatrical production. (Students may register in this course only if they have been accepted as a member of a production management crew.)

106. Studies in Dramaturgy (4)

A production/performance-oriented course exercising extensive developmental participation in the creative work of actors, directors, designer, and playwrights through research and textual analysis. (Students may register in this course only if they have been accepted as a dramaturg.)

Note: a total of twelve units for Drama 101, 102, 103, 104, 105 and 106 may be counted toward graduation.

120. History of Dance (4)

Study of the concepts, theories, and styles of dance from all cultures as a form of human expression. Lecture material will be supplemented with texts, films, and demonstrations.

122. Studies in Dance Composition (4)

Examination of skills and techniques required by various dance forms from Afro-Cuban to jazz. The course will emphasize compositional studies through the development and presentation of student works. *Prerequisite: consent of instructor.*

123A-B. Intermediate Ballet (4-4)

Concentrated development of dance technique for ballet with studies in solo, duet, and Corps de Ballet etudes, advanced problems in ballet choreography, and creative explorations of ensemble compositions.

124. Mime for the Theatre (4)

An introduction to the art of mime, based on the principles developed by LeCocq and Decroux, leading to individual mime compositions through the development of technique, characterizations, and mimetic awareness.

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. *Prerequisite: consent of instructor. Drama 20 and 25 recommended.*

126. 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.*

127. Dances of the World: a Cross-Cultural Study (4)

Using film, videotapes, and effort/shape movement analysis for cross-cultural study of dance, this course offers an approach to dance as a basis for humanistic knowledge and experience. The selections of world dance cultures will vary each time this course is offered. *Prerequisites: Drama 126 and consent of instructor.*

128. Dance: Performance Workshop (4)

Work directed toward solo, duet, and group dances. Students will submit choreographic ideas for instructor's approval then proceed with rehearsals. Dances will be performed in the studio. Readings, lectures, laboratory. *Prerequisite: consent of instructor.*

130A-B. Intermediate Acting (4-4)

The process of acting, its theory and practice, examined through exercises, text analysis, and the preparations of scenes from the modern repertoire. Audition required. *Prerequisites: Drama 30 and/or consent of instructor.*

131. 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.

132A-B. Black Theatre Ensemble (4-4)

An intensive theatre practicum designed to generate theatre created by an ensemble, drawing from plays in the black theatre repertoire. From initial play analysis through actual performance and criticism of the results, each student will be intimately involved in the practical and theoretical process of theatre. *Prerequisites: Drama 30 and consent of instructor. Drama 16 recommended.*

133. 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 different camera angles. Students will rehearse and perform in simulated studio settings.

134. Ensemble Theatre (4)

An intensive theatre practicum designed to generate theatre created by an ensemble, with particular emphasis upon the analysis of text, explorations of ensemble rehearsal process, the development of technical self-support systems, the extension of performance modes, and performer/event/audience relationships. Work each term will include one new text and one play of the genre treated in the drama survey series courses: tragedy, epic, or comedy. *Prerequisite: consent of instructor. Drama 42, 43, 44 highly recommended.*

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: Drama 30 and Drama 70A-B-C.*

136. Freeing the Voice (4)

Intensive workshop for actors and directors designed to "free the voice," with special emphasis on characterization in a wide range of dramatic texts. This proven method combines experiential and didactic learning with selected exercises, texts, tapes, films, and total time commitment. *Prerequisite: consent of instructor.*

137A-B. Development of Chicano Teatro (4-4)

A. Exploration of the theatrical development of the teatro form and experimentation with various modes of realizing the acting styles, scenic modes, and production techniques of teatro.

B. A teatro production will be molded through intensive rehearsal, culminating in performances on the campus and in the community. *Prerequisites: Drama 15, consent of instructor, working knowledge of Spanish, and basic acting instruction.*

138A-B. Advanced Acting (4-4)

Further studies in the process of acting, theory, and practice, through concentrated work in character. Study and preparation of scenes from historical periods and the avant-garde. Audition required. *Prerequisites: Drama 130A-B and/or consent of instructor.*

139. 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. *Prerequisites: Drama 131 and consent of instructor.*

141. 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.

142. Chicano Dramatic Literature (4)

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. Drama 15 recommended.*

143. 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. The goal is a newly rounded understanding of a complex theatre artist. Topic will vary quarter to quarter. *Prerequisite: upper-division standing. Drama 42, 43, 44 recommended.*

144. The Theatre of Fantasy, Myth, and Dream (4)

A seminar exploration of plays and production styles that employ the art of the theatre to enter imaginative worlds beyond our conscious experience. *Prerequisite: upper-division standing or consent of instructor.*

145. Theatre and Society: Satire, Fact and Propaganda (4)

An examination of theatrical forms that probe social structure and human behavior, economics and class relationships, and politics and power. Ranging from the Greek to the modern theatre, plays will be studied in the context of the society for which they were written, and will include examples of social satire, social realism, documentary theatre, agit-prop drama, and didactic epic theatre. *Prerequisite: upper-division standing or consent of instructor.*

146. The Theatre of Private Life: Family and Friends (4)

A close examination of theatre informed by a concern for the nature of human interaction and personal interplay, as revealed by conflict within families or small groups. *Prerequisite: upper-division standing or consent of instructor.*

147. 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, illustrated with scenes presented live and on film.

148. 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. *Prerequisite: upper-division standing. Drama 42, 43, 44 recommended.*

149. Contemporary Theatre (4)

Seminar course dealing with the forms of contemporary theatre and principle figures in the contemporary theatre world — playwrights, directors, performers. Specific topic will vary from year to year. *Prerequisite: upper-division standing. Drama 42, 43, 44 recommended.*

160. The Classical Theatre (4)

After studying the theatrical structure of the Greek classical theatre, the student will be asked to consider subsequent generations' perceptions of classicism and their expression in the theatre. Classical theatre will be studied both as an historical period of seminal importance in the development of Western theatre, and as an ever-recurring approach to theatre reflecting a fundamental attitude toward life and art. *Prerequisites: Drama 42, 43, 44, and upper-division standing.*

161. The 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: Drama 42, 43, 44, and upper-division standing.*

162. The 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 ideas of realistic representation found their expression in elements of theatrical structure — acting, directing, design, dramatic text — and in the audience's experience and response. *Prerequisites: Drama 42, 43, 44, and upper-division standing.*

163. The History of Musical Theatre (4)

A discussion of the historical development of the form known as "musical comedy" beginning with the works of Gilbert and Sullivan through contemporary examples of Bernstein and Sondheim. An analysis of words and music and the tracing of the "form" as specific genre of theatrical entertainment. Such composers and lyricists as Lehár, Kern, Berlin, Gershwin, Rodgers and Hammerstein, and Lerner and Lowe will be discussed and analyzed.

164. Visual Ideas I (4)

History of visual expression of early civilizations of Asia, Africa, and Europe through the Middle Ages, 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. Drama 160, 161, 162 recommended.*

165. Visual Ideas II (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 the traditionally separate disciplines of fine and applied art, social and political history, and the theatre. *Prerequisite: upper-division standing. Drama 160, 161, 162 recommended.*

166. Visual Ideas III (4)

History of visual expression from 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. Drama 160, 161, 162 recommended.*

167. History of Costume (4)

A survey history tracing the evolution of clothing and its social context from preliterate cultures through the twentieth century. Offered in alternate years. *Prerequisites: Drama 164, 165, 166 recommended, and consent of instructor.*

168. History of Interior Design (4)

A survey history of interiors from Ancient Egypt to the present, focusing on the processes of design which gave shape to each cultural expression. Offered in alternate years. *Prerequisites: Drama 164, 165, 166 recommended, and consent of instructor.*

170A-B-C. Design Studio (4-4-4)

Intermediate problems in text analysis, research, conceptualization, and visual expression. Costume, lighting, scenic and property design are studied as an integrated process. Regular projects and critiques will cover a range of design problems and skills. Drama 170A prerequisite to 170B. *Prerequisites: Drama 74 and consent of instructor. Drama 164, 165, 166 recommended.*

172. Advanced Design Studio (4)

A complete design for one theatre event, (unproduced). Offered in alternate years, as justified by potential qualified students. *Prerequisite: admission by portfolio only.*

173. Drawing for the Theatre (4)

Studies in representational drawing for the theatre designer. *Prerequisite: Drama 74.*

174. Lighting for the Theatre (4)

Methods of stage lighting for drama, opera, and dance. Advanced work in designing lights for different staging configuration, e.g., proscenium, thrust. *Prerequisites: Drama 70A, 170B, and/or consent of instructor.*

175. Scenery for the Theatre (4)

Advanced studies in technical production of scenery and properties for the theatre. Lectures and individual projects focus on problems in planning, drafting, construction, painting, and technical direction for a variety of performance spaces. *Prerequisites: Drama 70B, 74, 170A, and/or consent of instructor.*

176. Costume for the Theatre (4)

Advanced studies in costume production for the theatre. Lectures and individual projects focus on problems of drafting, draping, and construction; the work of the professional cutter in relation to the costume designer is seen in the context of various theatre modes and performance spaces. *Prerequisites: Drama 70C, 74, 170A, and/or consent of instructor.*

177. Theatrical Makeup (4)

This class is intended to be a workshop in the study of theatrical makeup and its application. Studies in age makeup, character makeup, animal makeup, prosthetic and hair piece application and construction, etc. Should serve to acquaint the theatre student with the basics needed to create the visual elements of an acting role.

179. Seminar in Design (4)

A study of a significant period of aesthetic movement in the history of design for the theatre. Offered once each year. *Prerequisite: consent of instructor. Drama 164, 165, 166 recommended.*

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. *Prerequisites: Drama 130A/B and consent of instructor.*

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.

182. Major Project in Theatre Management (2 or 4)

Designed for the advanced student in directing, this course will allow for concentration on a demanding assignment in theatre management and administration, including such areas of responsibility as stage management, advertising and promotion, tour management, and financial administration. 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. *Prerequisites: Drama 135 and consent of instructor.*

183. 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. *Prerequisites: Drama 131 and 139 and consent of instructor.*

188. Touring Theatre (0-8)

Intensive studio ensemble course designed to provide the student the full range of learning experiences which evolve from the complex necessities of touring theatre to a wide variety of locales and a broad range of performance spaces. *Prerequisite: consent of instructor.*

189. Major Seminar (4)

Required for all drama majors. Seminar designed to provide the student with opportunity to explore a variety of topics relating to the dramatic arts to be presented by the Department of Drama faculty and distinguished guest lecturers.

196. Senior Study in Theatre (2-8)

Designed for the senior drama 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 Drama (0-2-4)

Group studies, readings, projects, and discussions in drama history, problems of production and performance, and similarly appropriate topics. *Prerequisites: minimum, junior standing and consent of instructor.*

199. Special Projects in Drama (0-2-4)

Qualified students will pursue special projects in reading drama, studying drama history, or doing research for a production. *Prerequisites: minimum, junior standing and consent of instructor.*

Graduate

210A-B-C. Theatre Process Studio I (3-3-3)

A systematic exploration of the dynamics of the process of acting, employing intensive experiential examination of various approaches, methodologies, genres, and periods to give form and substance to the actor's creative work (S/U grades only). *Prerequisites: 210A for B, 210B for C.*

211A-B-C. Graduate Theatre Seminar I (1-3/1-3/1-3)

A weekly seminar in which the vital interrelationships of dramatic theory, text, and performance are probed. In addition to examination of aesthetic and critical formulations, literary analyses, historical models, and cross-cultural patterns of performance theory, the seminar will strongly relate to the work in the theatre process studio and in theatre production (S/U grades only). *Prerequisites: 211A for B, 211B for C.*

Earth Sciences

212A-B-C. Theatre Production I (1-3/1-3/1-3)

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 (1-1-1)

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 (1-1-1)

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.

215A-B-C. Theory: Text/Performance/Design (3-3-3)

Three-quarter sequence designed as a coherent sequence of study examining intensively the three primary components of the theatrical event: the text, the performance, and the environment. There will be concentration on the literature of our discipline, with particular emphasis on historical data, theoretical aesthetic formulations, and analytical and creative models. (S/U grades only.) *Prerequisites:* 215A for B; 215B for C.

217. Graduate Design Studio (6)

Ongoing work on individual projects for all graduate design students, with group critiques of completed designs and works-in-progress. To be repeated each quarter of the graduate student's residence at UC San Diego.

220A-B. Classical Text (3-3)

An intensive studio examination of problems and potentials associated with the theatrical realization of the classical text.

221A-B. Graduate Theatre Seminar II (1-3/1-3)

A — Seminar focusing on approaches to and the functioning of commercial theatre and the film/television industry. Examination of the skills needed to participate in professional theatre.

B — Seminar devoted to extensive examination and analysis of specific plays, in preparation for their presentation as thesis projects in the spring graduate repertory season. (S/U grades only.) *Prerequisite:* 221A for B.

222A-B. Theatre Production II (1-3/1-3)

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 (1-1)

An advanced course in the art of movement for the theatre, building on the knowledge gained in Drama 213. (S/U grades only.) *Prerequisite:* 223A for B.

224A-B. Voice for Theatre II (1-1)

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.

229. Theatre Externship (6-9)

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. 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 theater 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 (1-3/1-3)

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:* Drama 232A for 232B.

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.

297. Thesis Research (0-4)

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 (1-2)

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 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.

EARTH SCIENCES

OFFICE: 1512 Humanities-Library Building, Revelle College

Developments in the discipline of the earth sciences suggest that the most effective means for undergraduates to enter this fascinating field is for the university to enrich its course work for majors in the Departments of Chemistry and Physics with contemporary and exciting courses in the earth sciences. These enrichment courses are taught by faculty members of the Scripps Institution of Oceanography.

The program is one which is based on the premise that a thorough grounding in one of the above disciplines 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 Department of Chemistry or Physics. At the beginning of the junior year, a student will select courses in consultation with the earth sciences advisers in the Geological Sciences Group in the Scripps Institution of Oceanography and his or her own major department. In most instances the student may 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 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 with 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)

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.

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, especially its crust, and the evolution of life as indicated by the fossil record. 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 vulcanism; and the work of wind, water, and glaciers in modifying the earth's surface, with the aim of creating 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 time-scale; 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.* G. Shor (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 or concurrent registration in 102.* M. Kastner (S)

198. Directed Group Study (2-4)

This course will cover a variety of directed group studies in areas not covered by format 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: 210 Third College Social Science Building, Third College

Professors:

Richard Attiyeh, Ph.D. (*Undergraduate Adviser*)

Donald V. T. Bear, Ph.D. (*Chairman*)

John Conlisk, Ph.D.

Robert F. Engle, Ph.D.

Clive W. J. Granger, Ph.D. (*Graduate Adviser*)

Theodore Groves, Ph.D.

Walter P. Heller, Ph.D.

John W. Hooper, Ph.D.

Ramu Ramanathan, Ph.D.

R. Robert Russell, Ph.D.

Associate Professor:

Dennis Smallwood, Ph.D.

Assistant Professors:

Vincent Crawford, Ph.D.

Jose Luis Guasch, Ph.D.

Jeffrey S. Hammer, Ph.D.

Tom K. Lee, Ph.D.

David M. Lilien, Ph.D.

Mark J. Machina, Ph.D.

Joel Sobel, Ph.D.

Visiting Assistant Professor:

Paul M. Sommers, Ph.D.

Lecturers:

Richard D. Emmerson, Ph.D.

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The department offers majors in economics and in management science leading to the B.A. degree, undergraduate minors in economics, management science, and business economics, and a Ph.D. program in economics.

The Undergraduate Program**Lower-Division Courses**

Three lower-division sequences which cover the basics of economic analysis and policy are offered each year: 1A-B-C, 2A-B-C, and 3A-B. 1A-B-C is a traditional introductory sequence. The A course covers microeconomics, the B course macroeconomics, and the C course applications involving both micro and macroeconomics. The 2A-B-C sequence covers the same topics, but utilizes a more mathematical presentation. The 3A-B sequence covers the same economic principles at the same analytical levels as 1A-B, but emphasizes applications from urban and international economics. Economics 4 is an introduction to management and its functions with an emphasis on accounting as the basic information system of organizations.

Appropriate selections from the 1, 2, and 3 sequences may be used to meet the breadth or social science requirements of Revelle, Muir, and Third Colleges. Students should check with their college advisers for details. Economics 4 does not satisfy any college breadth requirements.

Three quarters of lower-division work in economics are a prerequisite for upper-division work in economics. This requirement can be met by taking 1A-B-C, 2A-B-C, or 3A-B-1C, or other combinations of A, B, and C courses, such as 3A-2B-1C. Transfer students who have taken three quarters or two semesters of a standard introductory sequence will have satisfied this prerequisite. Students planning to major in management science should take Economics 2A-B and 4.

The Economics Major Program

The undergraduate major in economics is designed to provide a broad understanding of resource allocation and income determination mechanisms. Both the development of the tools of economic

analysis and their application to contemporary problems are stressed. This program serves to prepare students for graduate work in economics, and in such related areas as business, law, and public administration. It also provides useful training for students who plan to enter careers in business or public administration upon graduation.

Each student majoring in economics will be required to take either Economics 1A-B-C or 2A-B-C or 3A-B-1C. (Combinations of A, B, and C from more than one sequence are permitted — e.g., 1A-2B-1C or 3A-2B-1C are permissible alternatives.) Mathematics 1A-B-C or 2A-B-C are required for the major and should be taken if possible before beginning upper-division course work in economics. In addition to the lower-division requirements, at least twelve upper-division courses in economics must be taken, including Economics 100A-B, 110A-B, and 120A-B. These courses introduce the major to basic tools and concepts which have applicability to a wide variety of contemporary problems. Students are encouraged to take at least two of these core sequences prior to the senior year, since many electives have one or two of them as prerequisites.

A 2.0 (C) grade-point average in upper-division economics courses is a degree requirement for students majoring in economics. The only courses that can be taken on a Pass/Not Pass basis and also count toward the twelve upper-division courses required for the major are Economics 195A-B-C, 197, and 199. A maximum of twelve units taken on a P/NP basis can count toward the major.

The department offers an honors program for economics majors. Students earning departmental honors will have the phrase "with distinction" on their diplomas. The requirements are as follows:

1. fifteen upper-division courses
2. electives must include 120C, either 105 or 113, and either 111 or 117
3. a GPA for upper-division economics courses of at least 3.5

If necessary, the GPA standard will be raised so that no more than 20 percent of graduating economics majors will graduate with departmental honors.

The economics major is encouraged to discuss elective courses and choice of minor with the undergraduate adviser for economics. Depending on individual interests and career plans, courses in related fields such as political science,

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history, and mathematics may be appropriate. Certain courses from other departments, such as History 158A-B, and 178, and Political Science 124A, 155A-B, and 177, may be used as electives in the major. No more than two courses from other departments may be used to meet the upper-division course requirement. Graduate work in economics requires a strong mathematics background, which should include Mathematics 2E and 2F and, depending on the student's interests, ought to include certain upper-division mathematics courses.

The following schedule is recommended for economics majors:

FALL	WINTER	SPRING
Freshman and/or Sophomore Years		
Mathematics 1A or 2A	Mathematics 1B or 2B	Mathematics 1C or 2C
Economics 1B, 2A, or 3A	Economics 1A, 2B, or 3B	Economics 1C or 2C
Junior Year		
Economics 100A Economics 110A or 120A	Economics 100B Economics 110B or 120B	Elective Elective
Senior Year		
Economics 110A or 120A Elective	Economics 110B or 120B Elective	Elective Elective

The Management Science Major Program

This program is designed to give the student an understanding of the quantitative techniques that have been designed for managers concerned with making the best use of scarce resources, and of their applications in both private and public enterprise. While the student will gain some familiarity with the traditional functional fields of business management, this program is more tightly focused and more quantitative than the traditional business administration major.

Students with a B.A. in management science will find themselves well prepared for further study in business administration or management science. With appropriate choice of electives, individual programs can also provide excellent preparation for graduate work in economics or public administration. Students interested in law school will normally choose the traditional economics program, though it should be noted that law schools tend to look favorably on students who have had some experience with the precise reasoning required by quantitatively oriented courses of the type stressed in the management science curriculum. Graduates of this program who elect to seek employment upon graduation will have the advantage of having attained an understanding of

the types of problems faced by practicing managers and of the modern techniques available for analyzing them. Consequently, they might have better employment opportunities than graduates of many other liberal arts majors.

Each student majoring in management science will be required to take Economics 2A-B and Economics 4, since a good understanding of basic principles of economics, management, and accounting is essential to upper-division course work. Mathematics 2A-B-C-E-F is also required, as it is also necessary that the student acquire the mathematical tools needed to understand the quantitative techniques of management science. EECS 61 is also required since many applications of management science techniques involve the use of a computer. In some instances, modification or substitution is possible in this list of lower-division course requirements. The undergraduate adviser should be consulted regarding the acceptability of such changes.

At the upper-division level, fifteen courses are required including Economics 170A-B, Economics 171A-B-C, Economics 172A-B-C, and Economics 173. The 170 sequence provides an understanding of the economics of the individual enterprise and analyzes the nature and interdependence of managerial resource allocation decisions. Economics 171A-B-C presents techniques for analysis and decision making under conditions of uncertainty, and Economics 172A-B-C provides a general survey of optimization techniques employed by management scientists. Economics 173 treats the structure and language of accounting systems and their use in managerial decision making. No course work other than Economics 195, 197, and 199 taken on a Pass/Not Pass basis may be counted toward fulfillment of upper-division major requirements.

Of the six management science electives, at least two must be chosen from among Economics 175, Financial Management; 176, Marketing Management; 177, Operations Management; and 178, Business Forecasting. Each of these courses focuses on an important set of managerial problems. The remaining electives must be selected from other upper-division economics offerings and the following courses offered by other departments:

AMES 141A B C
AMES 162A B C
EECS 159A B C

Mathematics 170A B C
Mathematics 171A B
Mathematics 180C

Mathematics 102
Mathematics 111A,B
Mathematics 131

Mathematics 181B
Psychology 141
Sociology 111

The following schedule is recommended:

FALL	WINTER	SPRING
Freshman Year		
Mathematics 2A	Mathematics 2B	Mathematics 2C
Sophomore Year		
Economics 2A Mathematics 2E	Economics 2B Mathematics 2F	Economics 4 EECS 61
Junior Year		
Economics 170A Economics 171A Economics 172A	Economics 170B Economics 171B Economics 172B	Economics 173 Economics 171C Economics 172C
Senior Year		
Elective Elective	Elective Elective	Elective Elective

Students considering management science as a major should consult the undergraduate adviser prior to beginning upper-division work.

Minors and Programs of Concentration

The department offers three minor programs: economics, management science, and business economics. These are described below. Any of these may be used to satisfy the Revelle College minor requirement or to obtain an optional minor in Muir or Third College. Warren College students should consult their college advisers for a list of approved programs of concentration offered by the department.

The economics minor consists of six courses in economics, at least three of which must be at the upper-division level. It may be composed of A, B, and C courses from the Economics 1, 2, and 3 sequences and any three upper-division economics courses.

The management science minor consists of Economics 2A-B, 4, and three courses from: 170A-B, 173, 171A-B-C, 172A-B-C.

The business economics minor consists of the following components:

Economics — Economics 1A-B, 2A-B, or 3A-B.

Accounting — Economics 4 and 173.

Statistics — Mathematics 6A-B, Economics 120A-B, or Economics 171A-B. (Students who have had calculus should take 120A-B or 171A-B.)

Computer Science — EECS 61.

Financial Management — Economics 175.

Elective — One of Economics 103, 118, 139, 159, or 178.

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. To receive a Ph.D., a student must pass qualifying examinations, complete an empirical project, and prepare an acceptable dissertation. The qualifying examinations consist of four written parts and an oral part. The four written parts cover microeconomics, macroeconomics, econometrics, and an elective special field. The oral part covers all areas.

There are no formal course requirements. However, to prepare for the micro, macro, and econometrics qualifiers, nearly all students take the complete 200, 210, and 220 course sequences. Elective lecture courses, workshops, and individualized reading tutorials prepare students for special field qualifiers. Foreign-language proficiency is required only when it is crucial to a student's dissertation research.

Ideally, a student will have finished all qualifying examinations by the end of the second year, and will have a nearly completed dissertation by the end of the third year. In fact, it usually takes longer, though students are discouraged from remaining in residence more than four years.

Prior to entering the program, a student is required to have a knowledge of economics at least through an introductory level, and to have at least the equivalent of a one-year course in calculus. The program emphasizes proficiency in the mathematical methods of modern economic analysis. Some of these methods are taught in the first quarters of the micro, macro, and econometrics course sequences.

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.

Courses

Lower Division

1A-B-C. Elements of Economics (4-4-4)

The objectives of this survey course are to prepare students for a major or minor in economics, and to give those who will not specialize in economics an understanding of how the economy functions. Elementary theories of resource allocation and income determination are used to analyze policy issues of major significance. 1A is *not* required for 1B, but both A and B are required for 1C.

2A-B-C. Introduction to Economics Analysis (4-4-4)

The content of this course is virtually the same as that of the 1 sequence, but mathematical methods of analysis are stressed. 2A is *not* required for 2B, but both A and B are required for 2C. *Prerequisite:* Math. 1C.

3A-B. Principles of Economics (4-4)

The content of this course is virtually the same as that of Economics 1A-B, except that 3A and B emphasize policy issues relating to urban and development economics. 3A is not required for 3B. Economics 1C or 2C can be used with 3A-B to complete the three-quarter lower-division sequence required for all upper-division economics courses.

NOTE: Normally the timing of the above sequences will be as follows: fall 1B, 2A, 3A; winter 1A, 2B, 3B; spring 1C, 2C. The A courses are not required for the B courses, but both the A and B courses are required for the C courses. Students with scheduling problems may combine A, B, and C courses from different sequences.

4. Introduction to Management and Accounting (4)

An introduction to the concept of management and its functions, with emphasis on accounting as the basic information system of organizations. Topics to be considered include: marketing, production, finance, basic accounting concepts, financial statements (construction and analysis).

Upper Division

NOTE: All upper-division courses have as prerequisites one year of lower-division economics. This may consist of A, B, and C courses selected from the 1, 2, and 3 sequences or 2A-B, 4. Additional prerequisites are listed under the course offerings. For courses in sequences, such as 100A-B or 171A-B-C, the A courses are prerequisite to the B courses, and the B courses are prerequisite to the C courses.

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. *Prerequisites:* One year of lower-division economics and Math. 1C.

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:* One year of lower-division economics and Math. 1C.

103. International Monetary Relations (4)

Balance of payments, international capital movements, and foreign exchange examined in light of current theories, policies, and problems. *Prerequisite:* Econ. 101.

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.

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 year of lower-division economics and Math. 1C.

111. Financial Institutions and Monetary Policy (4)

A study of the financial structure of the United States economy including analysis of bank behavior and the techniques of central bank monetary control. *Prerequisite:* Econ. 110B.

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. The Evolution of Economic Theory and Policy (4)

An examination of the evolution of economic theory and policy in Western Europe and Great Britain during the eighteenth and nineteenth centuries. While attention is given to the works of such individuals as A. Smith, D. Ricardo, T. R. Malthus, J. S.

Mill, K. Marx, J. E. Cairnes, and others, the primary emphasis is on the development of economic analysis as a response to the economic problems of the times. *Prerequisite:* One year of lower-division economics.

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 year of lower-division economics.

117. Economic Growth: Problems and Prospects (4)

Problems of economic growth in modern developed economies, with emphasis on population growth, environmental degradation, and resource conservation. *Prerequisite:* Econ. 110B.

118. Law and Economics (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. *Prerequisite:* One year of lower-division economics.

120A-B-C. Statistical Methods in Economics (4-4-4)

Statistical methods of special application to economic problems, and statistical problems commonly encountered in confronting economic models with nonexperimental data. Correlation and regression analysis with applications to time-series and cross-section data; estimation of simultaneous equations models. *Prerequisites:* One year of lower-division economics and Math. 1C.

130. Public Policy (4)

The application of macroeconomic and microeconomic theory to issues of public policy and the contributions of related disciplines, e.g., political science, sociology, education, history to the solution of these problems. (The student will be required to study one problem intensively.) *Prerequisite:* One year of lower-division economics.

131. Economics of the Environment (4)

Analysis of the causes of pollution (air, noise, water) and nonoptimal utilization of certain resources (e.g., fisheries, wilderness areas, air) and of public policies to deal with these problems. *Prerequisite:* One year of lower-division economics.

134. Regional Economics (4)

Location theory, agglomeration economics and diseconomies; transportation; migration; regional modelling. *Prerequisites:* Econ. 100B or 170B and 120B or 171B.

135. Urban Economic Problems (4)

Analysis of causes of congestion, pollution, housing discrimination and segregation, crime, etc., and of public policies to deal with these problems. *Prerequisite:* One year of lower-division economics.

136. Human Resources (4)

Theoretical and empirical analysis of public and private investment in people, emphasizing the contribution to productivity of education. *Prerequisite:* One year of lower-division economics.

137. Inequality and Poverty (4)

Analysis of inequality in the distribution of income, education, and wealth; causes of poverty and public policies to combat it. *Prerequisites:* One year of lower-division economics and 120A or 171A.

138. Economics of Health (4)

The application of economic analysis to health field; the role of health in income, production, and poverty; supply, demand, and price determination in the public and private health sectors. *Prerequisite:* One year of lower-division economics.

139. Labor Economics (4)

A study of labor markets including such topics as collective bargaining, evolution and impact of unions, labor force participation, labor mobility, the effects of technological change or unemployment. The implications for public policy will be given extended consideration. *Prerequisite:* One year of lower-division economics.

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. *Prerequisite:* One year of lower-division economics.

Economics

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.

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.

160. Economic Planning (4)

An examination of the theory and practice of economic planning in a number of European countries. Included are central planning in the Soviet Union, decentralized socialist planning in Yugoslavia, indicative planning in France, and macro planning in the Netherlands. *Prerequisite:* Econ. 100B or 170B.

161. Comparative Economic Systems (4)

Capitalism and socialism, studied as ideal models and in actual performance. *Prerequisite:* One year of lower-division economics.

170A-B. Managerial Economics (4-4)

Microeconomic theory, with special reference to costs and production and the theory of the firm, some applications. Demand analysis and forecasting, costs and production, business conditions analysis, price and other marketing variables, financial analysis. Not open to students who have taken Economics 100A-B. (Students may take 170B after taking 100A in lieu of 170A.) *Prerequisites:* Econ. 2A-B and Math. 2C.

171A-B-C. Probabilistic Systems Analysis (4-4-4)

Basic probability theory; data handling; common distributions and stochastic processes; expectation, moments, and the central limit theorem. Estimators and their properties, hypothesis testing, relations among random variables, regression analysis. Unified approach to decision making under uncertainty, Bayesian techniques, prior and posterior distributions, value of information and preposterior analysis. 171A-B not open to students who have taken 120A-B. *Prerequisites:* Econ. 2A-B and Math. 2E.

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. *Prerequisites:* Math. 2E and Econ. 2A-B. Econ. 171B or 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. Advanced Topics in Management Science (4)

Content to vary from year to year; course will focus on a particular set of optimization techniques or managerial decision problems. *Prerequisites:* Econ. 170B, 171C, and 172C, or consent of instructor.

175. Financial Management (4)

Analysis and management of the flow of funds through an enterprise, functions and operations of money and capital markets, management of short-term assets and liabilities, raising long-term funds, selection of investment projects, and determination of the cost of capital. *Prerequisite:* Econ. 120A or 171A.

176. Marketing Management (4)

The role of marketing in the economy and the functioning of markets. Operational models of buyer behavior, and techniques for demand analysis and sales forecasting. Managerial decisions relating to the marketing mix; promotion, product selection, pricing, and distribution. *Prerequisite:* Econ. 100B or 170B.

177. Operations Management (4)

Principles and techniques relevant to problems of effective resource use faced by operating managers. Topics include project planning and control, facility design and scheduling, quality control, maintenance policies, and the function and management of inventories. *Prerequisite:* Econ. 172C.

178. Management Science: Business Forecasting (4)

An examination and evaluation of quantitative forecasting techniques in business and economics. These techniques are applied to demand and price changes, introduction of new products, inventory levels, demographic projections, and other areas in business and economics. *Prerequisite:* Econ. 120B or 171B.

179. Management in the Public Sector (4)

Problems in evaluating the consequences of government actions; applications of cost-benefit and cost-effectiveness analysis, budgeting systems. Problems involved in the management of nonprofit enterprises, approaches to their solution. *Prerequisite:* Econ. 170B or 100B.

190A-B-C. Research Seminar (4-4-4)

Each quarter's seminar will focus on a particular contemporary economic issue. Each student will do independent work on some aspect of that issue. Students will generally be required to present their findings orally and in writing. *Prerequisites:* Econ. 100B, 110B, and 120B.

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 undergraduate adviser for economics.

197. Field Studies (4)

Individually arranged field studies designed to augment the student's academic training with practical experience outside the university. By special arrangement with a Department of Economics faculty member. (P/NP grades only.) *Prerequisites:* consent of instructor and departmental approval.

199. Independent Study (2 or 4)

Independent reading or research under the direction of and by special arrangement with a Department of Economics faculty member. (P/NP grades only.) *Prerequisites:* consent of instructor and departmental approval.

Graduate

200A-B-C-D-E-F-G. Microeconomics (4-4-4-4-4-4-4)

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. Advanced Economic Theory (4-4)

An intensive examination of the literature on selected topics of current importance in economic theory. *Prerequisites:* Econ. 200G 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. 200G.

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, growth theory, empirical applications to single aggregate functions.

211A-B. Fiscal and Monetary Theory and Policy (4-4)

Macroeconomic models and empirical studies emphasizing the monetary and government sectors, the interaction of fiscal and monetary policies, and their relative impact on aggregate output and the price level, microeconomic foundations of aggregate asset demand and supply, regulation of financial institutions. *Prerequisite:* Econ. 210D or consent of instructor.

212A-B-C. Workshop 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 econometric and time series methods; development of related research topics by both graduate students and faculty. (S/U grades only.) *Prerequisite:* Econ. 210D.

220A-B-C-D-E-F-G. Econometrics (4-4-4-4-4-4-4)

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 and G) 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. Advanced Econometrics (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. 220G or consent of instructor.

230A-B. Public Economics (4-4)

Impact of the government sector via expenditure and tax policies on resource allocation and income distribution; public goods; theory and applications of benefit-cost analysis; theory of social choice; efficiency and distributional effects of tax policies. *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. 200G 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.)

236A-B. Human Resource Economics (4-4)

Human capital formation and education; income distribution and poverty; the economics of health, the medical sector, and the role of insurance. *Prerequisite:* consent of instructor.

238A-B. Urban and Regional Economics (4-4)

Urban models based on location theory will be used to investigate the structure of cities and patterns of land use. The models will be expanded to cover housing, discrimination, urban renewal, transportation planning, and empirical urban modeling efforts. Regional income determination will be discussed from an analytical viewpoint emphasizing both demand and comparative advantage. Factor migration, agglomeration economics, returns to scale, externalities of congestion and pollution, local public finance and empirical regional models will be discussed. *Prerequisite:* consent of instructor.

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. 200G, 210D, and 220G, 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.)

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.)

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: International Center, Administrative Complex

Administered for the University of California by the Santa Barbara campus, the Education Abroad Program (EAP) is now entering its seventeenth year of operation. Study Centers have been established in Austria, Brazil, Egypt, France, Germany, Hong Kong, Israel, Italy, Japan, Kenya, Mexico, Norway, Peru, Spain, Sweden, the United Kingdom and Ireland, the USSR (Leningrad), and West Africa (Ghana, Sierra Leone, and Togo). A special program for students interested in film has been established in Paris. All programs are for a single academic year, except for Hong Kong, where certain qualified students enter the program as seniors and remain for one additional year of graduate study.

Purpose

The Education Abroad Program was originally designed to give mature, highly motivated, and academically superior 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 significant contribution in assisting a small number of selected students in their programs toward advanced degrees.

The program stimulates the intellectual development of the participants, broadening the general education of all and giving a new depth to the particular academic interests of some. Most gain fluency in a language other than their own, and all grow in their ability to engage in independent study. Perhaps most valuable of all are increased self-understanding, clarified life purposes, and a broadening and deepening of personal values.

One of the most distinctive features of the program is the emphasis placed on the full integration of the UC students into the life of the host university. For the most part, UC students abroad live as do the students of the host university, 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 (except for the programs in Egypt, Hong Kong, Africa, and the United Kingdom and Ireland); (2) a full academic year of credit courses; 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 graduation. 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 special 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 academic counselor in the coordinator's office.

Europe

Austria. The program is small and is designed to offer an opportunity to pursue a specialized interest to a limited number of highly qualified students. A compulsory intensive language course at Georg August University in Göttingen,

Germany precedes the beginning of the academic year. All courses are taught in German.

University of Vienna. Eastern European studies (Balkans, Soviet Union), fine arts (history of art, music, theatre arts), folklore, history. (This is a cooperative program with Stanford University.)

France. A compulsory intensive language course precedes the beginning of the academic year. All courses in the universities are taught in French. UC faculty directors are in residence at Bordeaux, Grenoble, and Paris.

University of Bordeaux. Broad areas of the humanities and social sciences. 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 Marseilles. Biological sciences and environmental marine biology. The Marseilles program is open only to students in the biological sciences. Students who have completed only one year of French are eligible for participation, but they must take part in the two-month summer Intensive Scientific French program at the University of Montpellier.

University of Montpellier. Humanities and literature, primarily through Paul Valéry University.

University of Paris. Film studies and some theatre studies. Graduate programs in history and literature.

Pau-Paris. The participants spend the first semester at the University of Pau and then, at the end of January, move to Paris to study at the University of the New Sorbonne (Paris III). In addition to required core courses in French civilization, students are able to take courses in humanities and social sciences, with emphasis on comparative cultural studies, and French civilization and language.

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.

Education Abroad Program

Georg August University, Göttingen. Broad curriculum covering most majors. Excellent science programs, with substantial strength in biology, chemistry, and physics. Space in laboratory courses in biology and psychology may be limited.

Eberhart Karl University, Tübingen. An eight-week summer program in German language for graduate students only.

Italy. A compulsory intensive program in language and history 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 they must take part in a special two-month summer language program at the University of Perugia, followed by the normal, compulsory intensive language program in Padua. A UC faculty director resident in Padua administers all EAP programs in Italy. All courses are taught in Italian.

University of Padua. History of art (including archaeology), Italian literature (including linguistics), and political science (which includes history, social sciences, geography and demography, as well as political science in the American sense.) Sciences are not available for UC students.

Conservatorio di Musica C.B. Martini, Bologna. Individual instruction in music performance, composition, music history. An audition is required for admission.

Accademia delle Belle Arti di Venezia, Venice. Art studio and some art history. Colored slides of portfolio of artistic work must be submitted for admission.

Cini Foundation, Venice. Independent study projects for graduate students in art history.

Norway. Knowledge of Norwegian is not required, but a compulsory intensive course in Norwegian (mid-June to mid-August) precedes the beginning of the academic year. Intensive language study is continued during the fall semester. All courses are taught in Norwegian.

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.

Spain. A compulsory intensive language program precedes the beginning

of the academic year. All instruction is in Spanish.

University of Barcelona. Humanities (with emphasis on Spanish art, history, literature, and linguistics) and some social sciences. A study program consists entirely of core courses developed for the center and taught by the University of Barcelona. (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.

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 Exeter, University of Kent, University of Leeds, Westfield College (University of London).* Occasionally, students may be placed on an *ad hoc* basis at such institutions as University of Bath, London School of Economics, Oxford University, Polytechnic of Central London, University of Warwick, Wimbledon School of Art (London).

Ireland. *Trinity College of the University of Dublin.*

Scotland. *University of Edinburgh, University of St. Andrews, University of Stirling.*

Generally, the host universities offer a broad curriculum that includes most liberal arts majors. Life sciences and

physical sciences are available. Polytechnic of Central London is open to students in architecture, and Wimbledon offers art studio, art history, and three-dimensional design, including theatre design.

USSR. The Russian program is a one-semester program organized by a consortium of American universities. Three years of Russian at the university level is a firm prerequisite. The program is primarily intended for language majors, but it is open to students of literature, history, area studies, etc.

Leningrad State University. Russian language and civilization only.

Middle East

Egypt. All courses are taught in English, except courses in Arabic language and literature.

The American University, Cairo. A broad curriculum offered by the faculty of arts and sciences. All students are required to take at least one year-long course in Arabic.

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.

University of Haifa. Humanities and social sciences, with special emphasis on contemporary Israel and Arab-Jewish studies. Limited opportunity in the sciences. Special program in underwater archaeology. Courses are taught in Hebrew. The Department of Study Programs for Overseas Students offers a core curriculum in Jewish, Middle East and Israeli studies, social sciences, and history of modern Israel in English.

Hebrew University, Jerusalem. Broad curriculum, with emphasis on Israel and Middle Eastern studies. UC students enroll in a special program for foreign students, taught in English. The program offers courses in Judaica, Israel, Middle Eastern studies, and a few courses in the general social sciences and humanities. In addition, the School for Overseas Students, in cooperation with the mathematics and science faculty, offers an extensive program in the sciences based mainly on laboratory courses. Students with command of Hebrew have access to a broader curriculum throughout the Hebrew University.

Far East

Hong Kong. A limited selection of courses is offered in English. Knowledge of Chinese is not required for acceptance, but all students are required to include eighteen units of Mandarin or Cantonese in their annual program.

Chinese University, Hong Kong. Humanities and social sciences, with emphasis on Chinese studies. Art studio and music performance courses are available. (Information about courses to be offered in English is announced only one week before instruction begins.)

A special two-year program, including at least one year of graduate study, is available to students pursuing graduate degrees in Chinese studies and related fields.

Japan. Completion of one year of Japanese at the university level or the equivalent is required for acceptance. (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.

International Christian University, Mitaka (Tokyo). Humanities and social sciences, with emphasis on Japanese language and problems of the Orient.

University of Tsukuba. Open to graduate students only. Admission requires completion of at least two years of college-level Japanese. Major fields of graduate study are available; most UC students will be accepted in the Area Studies program.

Africa

In West Africa students enroll in courses from a variety of related fields which are usually taught from an African perspective and with an African emphasis. Academic study in Ghana and Sierra Leone is based on the British education system with classes primarily taught in English, while in Togo, classes are taught in French. Among the academic fields of study at the *University of Ghana* are: anthropology, economics, English literature, ethnomusicology, geography, history, language, political science, religious studies, sociology, and zoology. *Fourah Bay College* offers courses in demography, economics, education, geography, history, literature, marine biology, oceanography, religious studies, and the social sciences. The *Uni-*

versity of Benin emphasizes applied social sciences, economics, geography, history, international relations, law, literature, and philosophy.

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. Humanities and social sciences, with emphasis in African studies. Limited opportunities in the sciences and in veterinary science. Graduate students in history, political science, sociology, architecture, and design may associate with the Institute for Developmental Studies, Institute for African Studies, of the Housing and Research Development Unit.

Latin America

Brazil. Language requirements for admission to this program are: two years of college-level Portuguese or the equivalent; or one year of college Spanish and one year of college Portuguese; or two years of college Spanish and completion of an intensive course in Portuguese prior to departure. Since courses are taught in Portuguese, the equivalent of one year of college-level Portuguese is the absolute minimum. A compulsory intensive language course precedes the beginning of regular course work.

University of São Paulo. Brazilian literature, Portuguese language, arts, humanities, and social sciences. (This is a cooperative program with the University of Indiana.)

Mexico. A compulsory intensive language program precedes the beginning of the academic year. Students usually enroll in courses offered by the School for Foreign Students. Those who are qualified have access to the full curricular offerings of the host university.

National Autonomous University of Mexico (UNAM), Mexico City. Humanities, social sciences, and art practice. The School for Foreign Students offers Latin American art, literature, and history, Mexican and Central American studies, and Spanish language and literature.

Peru. A compulsory intensive language course precedes the beginning of the academic year. All courses are taught in Spanish.

Universidad Católica, Lima. Humanities and social sciences. Anthropology, archaeology, and ethnohistory are of special interest. (This is a program of the Peru Consortium, which is composed of the University of Indiana and a number of California universities.)

Academic Planning and Advising

A participant who wishes to make normal progress toward graduation should counsel *in advance* with a departmental adviser and the provost of the college 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 *EAP Advisers' Manual* in the International Center office, the four provosts' offices and the Central University Library on campus. Since offerings at the host universities may change rapidly, the listings in the *EAP Advisers' Manual* represent some of the courses UC students have taken in the past. 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 the 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.

Normally, students apply for admission to the program during the fall or winter quarters of their sophomore year. However, a limited number of students are accepted each year to participate as seniors and as graduate students. Such students should make inquiries of the provost of their college as well as with academic advisers in their major departments in order to learn in what ways participation will affect their status.

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 committee appointed by the chancellor. Basic requirements are: upper-division standing (eighty-four units) in the university at the time of participation, a 3.0 GPA at the time of application, and two years of university-level work in the language of the country with a B average; or the equivalent thereof which constitutes proficiency, as well as registration in two language courses (Literature 10 or 11, or higher) during two quarters of the sophomore year, preferably the winter and spring quarters. 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 advisers and to obtain clearance from the university's Student Health Service.

California junior college students may apply for the Education Abroad Program after one year of active enrollment at UC San Diego. 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 approv-

ing 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. In most instances, participants may take their university scholarships with them. The NDSL and Regents' loan fund are also available. Costs range between \$3,280 and \$6,500 for the year programs (including tuition, room and board, round-trip transportation, books, health and accident insurance, and some travel). Prospective participants who require financial assistance should counsel early with the Financial Aid Office.

Other Arrangements

The Education Abroad Program arranges transportation to various Study Centers and will assist in finding inexpensive transportation back to the United States at a time and by a means of the student's choosing. 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 Education Abroad Program Office at the International Center in the Administrative Complex, UC San Diego, and are given to students following a discussion of various aspects of the program with the EAP counselor. Completed applications are due before: early October, 1980 for USSR (spring semester); November 7, 1980 for Brazil and the United Kingdom-Ireland; January 23, 1981 for Austria, Egypt, France, Germany, Hong Kong, Israel, Italy, Japan, Kenya, Mexico, Norway, Peru, Spain, Sweden, USSR (fall semester), and West Africa. All further information, such as course offerings, selection, orientation, withdrawal from the program after selection, schedules of departures, and payment of fees may be obtained from the Education Abroad Program Office at the International Center, Administrative Complex, UC San Diego.

ELECTRICAL ENGINEERING AND COMPUTER SCIENCES (EECS)

OFFICE: 3216 Applied Physics and Mathematics Building, Muir College

Professors:

Hannes Alfvén, Ph.D.
Victor C. Anderson, Ph.D.
Henry G. Booker, Ph.D.
†Kenneth L. Bowles, Ph.D.
William S.C. Chang, Ph.D.
Carl W. Helstrom, Ph.D.
†T.C. Hu, Ph.D.
‡Sing H. Lee, Ph.D.
Robert Lugannani, Ph.D.
Elias Masry, Ph.D.
Barnaby J. Rickett, Ph.D.
Manuel Rotenberg, Ph.D. (*Dean of Graduate Studies and Research*)
M. Lea Rudee, Ph.D. (*Provost, Earl Warren College*)
Victor H. Rumsey, D.Eng., D. Sci. (*Chairman*)

Associate Professors:

Walter A. Burkhard, Ph.D.
William A. Coles, Ph.D.
Michael L. Fredman, Ph.D.
William E. Howden, Ph.D.
George J. Lewak, Ph.D.
Huey-Lin Luo, Ph.D.
Laurence B. Milstein, Ph.D.
Walter J. Savitch, Ph.D.

Assistant Professor:

William F. Appelbe, Ph.D.

Adjunct Professor:

Andrew J. Viterbi, Ph.D.

Associate Faculty:

Gustaf O. S. Arrhenius, Ph.D.,
Professor, Scripps Institution of Oceanography
Seibert Q. Duntley, Sc.D., *Professor Emeritus, Scripps Institution of Oceanography*
William B. Hodgkiss, Ph.D., *Assistant Professor, Scripps Institution of Oceanography*

†On leave 1980-81

‡On leave fall, 1980

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, computer science, 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.

The electrical engineering curriculum features three specializations: communication systems, electronics, and systems and control. The computer engineering and computer science programs treat compiler design, analysis of algorithms, computer architecture, operating systems, programming languages, and the application of computers to 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.

EECS 61 or 65 is recommended for all EECS majors. All students intending to do experimental work after graduation, whether in industry or in graduate school, are advised to take EECS 50A-B-C, EECS 146A-B-C, and EECS 138. A grade of C or higher is required in all courses included in the major program.

A total of at most four units of EECS 197, 198, and 199 may be applied to fulfilling requirements for a major program in the Department of Electrical Engineering and Computer Sciences. 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. 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.

ENGINEERING

The department offers B.S. programs in computer engineering, electrical engineering, and engineering physics. Because of Revelle College's extensive general-educational requirements, Revelle students will normally 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

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, 80A
- (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-2BL-2CL-2DL. These should be taken concurrently with Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D.
- (iv) EECS 61 or 65, 63, 64, and 70
- (v) EECS 50A-50B-50C
- (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) EECS 160A-B
- (b) EECS 161A-B-C
- (c) EECS 173, 175C, 179
- (d) EECS 175A
- (e) technical elective (3 quarters)

Senior Year

- (a) EECS 170A-B
- (b) EECS 171A-B
- (c) EECS 165
- (d) EECS 175B
- (e) technical elective (3 quarters)

Electives

EECS 105A-B-C	EECS 198
EECS 131A-B-C	EECS 199
EECS 140A-B-C	AMES 141A-B-C
EECS 141A-B-C	AMES 142A
EECS 146A-B-C	Math. 102
EECS 152A-B-C	Math. 160A-B
EECS 154A-B-C	Math. 170A-B-C
EECS 159A-B-C	Math. 171A-B
EECS 178	Math. 180A-B-C
EECS 197	Math. 181A-B

Electrical Engineering

The electrical engineering program comprises studies in communication systems, electronics, and systems and control; 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
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.

EECS

- (iii) Phys. 2AL-2BL-2CL-2DL
These should be taken concurrently with or after Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D.
- (iv) EECS 61, 64, and 70
- (v) EECS 50A-50B-50C
This sequence is normally taken in the sophomore year.
- (vi) Chem. 6A-6B or Chem. 7A-7B
A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

The upper-division course requirements depend on the option selected by the student.

Communication Systems Option

Junior Year

EECS 105A-B-C, EECS 152A-B-C
EECS 140A, EECS 135A,
EECS 138
technical elective (3 quarters)

Senior Year

EECS 154A-B-C, EECS 146A-B,
EECS 146C or EECS 136A
technical elective (3 quarters)

Electronics Option

Junior Year

EECS 105A-B-C, EECS 152A-B-C
EECS 140A, EECS 135A,
EECS 138
technical elective (3 quarters)

Senior Year

EECS 131A-B-C or Physics 100A-B-C,
EECS 146A-B, EECS 146C or EECS
136A.

Twelve units of technical electives including six units of laboratory courses.

Systems and Control Option

Junior Year

EECS 105A-B-C, EECS 152A-B-C
EECS 170A-B, EECS 138
technical elective (3 quarters)

Senior Year

AMES 141A-B-C, EECS 159A-B-C
technical elective (3 quarters)
(AMES 146A-B-C recommended)

Electives for all options.

Any EECS 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, and materials science. 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. 2B-2B-2C-2D or Phys. 3A-3B-3C-3D
- (iii) Phys. 2AL-2BL-2CL (or 3CL)-2DL
- (iv) EECS 61, 64
- (v) EECS 50A-50B-50C
- (vi) Chem. 6A-6B or Chem. 7A-7B

A lower-division course in biology may be substituted for Chem. 6B or Chem. 7B.

Acoustics Option

Junior Year

EECS 105A-B-C or AMES 105A-B-C
EECS 131A-B-C or Phys. 100A-B-C
EECS 140A-B-C or EECS 152A-B-C
Phys. 110A-B, AMES 110(*)

Senior Year

EECS 142AL-BL-CL
Phys. 130A-B, EECS 135A or Phys. 152
EECS 146A-B-C
EECS 152A-B-C or AMES 101A-B-C

Optics Option

Junior Year

EECS 105A-B-C or AMES 105A-B-C
EECS 131A-B-C or Phys. 100A-B-C
EECS 140A-B-C or EECS 152A-B-C
Phys. 110A-B, AMES 110(*)

Senior Year

EECS 141A-B-C
Phys. 130A-B, EECS 135A or Phys. 152
EECS 146A-B-C
EECS 152A-B-C or EECS 154A-B-C or
EECS 146AL-BL-CL, EECS 138

Continuum Mechanics Option

Junior Year

EECS 130A-B-C
EECS 105A-B-C or AMES 105A-B-C
EECS 131A-B-C or Phys. 100A-B-C
Phys. 110A-B or AMES 121A-B(*)

Senior Year

AMES 101A-B-C
Phys. 130A-B, EECS 135A or Phys. 152
Phys. 140A-B
EECS 146A-B-C or AMES 175A-B,
AMES 112

Materials Science Option

Junior Year

Mat. Sci. 101, 102, 103
EECS 105A-B-C or AMES 105A-B-C
EECS 131A-B-C or Phys. 100A-B-C
Phys. 110A-B, AMES 131A-B(*)

Senior Year

Mat. Sci. 104, 105, 106
Phys. 130A-B, EECS 135A or Phys. 152
Phys. 140A-B
EECS 146A-B-C

(*) 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.

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-2BL-2CL (or 3CL)-2DL
- (iv) Chem. 7A
- (v) EECS 61 or 65, 64
- (vi) EECS 50A-50B-50C
Math. 2F is recommended.

A total of fifteen upper-division courses, approved as a coherent program by the adviser, must be passed with a grade "C" or better in order to satisfy the requirements of the major program. Of those fifteen the following are required of all applied physics majors:

- (a) EECS 105A-B-C
- (b) At least two sequences from the following:
EECS 131A-B-C
EECS 135A-B, EECS 136A or 136B or 137
EECS 140A-B-C
EECS 146A-B-C
- (c) At least eight units of undergraduate laboratory courses selected from the following:
EECS 133, 136B, 137,
EECS 138 or 175B
EECS 141A-B-C
EECS 142AL-BL-CL
EECS 146AL-BL-CL
Phys. 120A-B, 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

EECS 105A-B-C, 131A-B-C,
140A-B-C, 142AL-BL-CL,
152A-B-C

Electronics

EECS 105A-B-C, 131A-B-C, 135A-B,
138, 146A-B-C-AL-BL-CL

Optics

EECS 105A-B-C, 131A-B-C,
140A-B-C, 141A-B-C,
152A-B-C; or Phys. 130A-B
and EECS 135A; or EECS 135A-B,
136A

Solid State

EECS 105A-B-C, 131A-B-C, 133,
146A-B-C, EECS 135A-B,
EECS 136A, Phys. 130A-B

Computer Science

The required lower-division courses are:

- (a) Math. 2A-B; Math. 2D-E or 2DA-EA
- (b) Phys. 2A-2B-2C
- (c) EECS 61 or 65, EECS 70

A total of fifteen upper-division courses must be completed in order to satisfy the major requirements. The following eleven courses are required: EECS 160A-B, 161A-B-C, 165, 170A, 171A, 175A-B, 179

Four electives should be chosen from the following list: EECS 146A-B-C, 159A-B-C, 166, 170B, 171B, 173, 175C, 178, 198, 199, Math. 160A-B, Math. 170A-B-C, Econ. 172A-B-C, Psychology 133.

Transfer students who have not completed a course equivalent to EECS 70 (assembly-language programming) may have difficulty completing the B.A. program in four years.

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-2F
- (b) Phys. 2A-2B-2C-2D or Phys. 3A-3B-3C-3D
- (c) EECS 50A-B-C
- (d) EECS 61 or 65

A total of fifteen upper-division courses must be passed 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 Programs

The following sets of six courses represent a variety of minor programs in the three main areas of applied physics, computer science, and information science. All course numbers refer to EECS courses. The prerequisites for these minors do not involve any other upper-division courses. They do require certain lower-division prerequisites, which must therefore be anticipated in the student's

lower-division program. Revelle students should consult their provost's office concerning their non-contiguous minor.

Acoustics

140A-B-C and 142AL-BL-CL

Computer Science

61 or 65, 70, 160A, and 161A-B-C

Diffraction Informatics

105A-B-C and 140A-B-C, or
50A-B-C and 140A-B-C

Electromagnetics

50A-B-C and 131A-B-C

Electromagnetic waves

131A-B-C and 140A-B-C

Optics

140A-B-C and 141A-B-C

Computing for Students in the Humanities and Social Sciences

An introduction to the structure and use of automatic digital computers is provided in EECS 61, Introduction to Computer Science, and EECS 63, Digital Computers: Non-Numeric Applications.

The Graduate Programs

There are four main divisions of study:

1. 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 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 radio-star scintillations.

- (b) *Materials Science, particularly Applied Solid State Physics*. This field includes material analysis (X-ray techniques, optical and electron microscopy, metallography), and when fully developed will also comprise material purification, crystal growth and the study of metals, semiconductors, dielectrics, and ceramics. Areas

of current research interest include the study of superconductors and the physics of metals and alloys.

- (c) *Applied Optics* This field includes laser applications in optical signal processing, integrated optics, and fiber optics communications. Current studies concern hybrid optical/electronic processing, optical processing with feedback and nonlinearity, image amplification, optical logic and memory devices, external-cavity waveguide lasers, diffraction and focusing of guided wave modes, integrated optical circuits, and fiber optics.

The department has available a number of laser (e.g. argon, krypton, dye, helium-neon and gallium arsenide lasers), a considerable amount of high quality optics, several optical benches, and vibration-isolated tables. There is also an optical shop for fabrication of specialized optics. Micro-fabrication facilities for the fabrication of optical circuits and compounds include an r.f. sputtering system, plasma etching, machine- and photo-lithography facility, diffusion furnaces, and other equipment.

- (d) *Electronic Devices and Materials*. This field includes the study of electronic, optoelectronic, and acousto-optical devices, and thin-film fabrication and evaluation; and the study of materials and processing techniques related to the devices. Currently a complete laboratory for the fabrication of silicon devices is being set up. This will be extended later to GaAs and other III-V compound materials and devices.

2. Computer Science

This program accepts both beginning and advanced graduate students for study and research leading to the degree of Doctor of Philosophy; the program also offers a Master of Science degree. The program is concerned with fundamental properties of digital information processing systems. Emphasis is placed on the design of computer systems, especially compilers, architecture, programming languages, operating systems, and the analysis of algorithms. The M.S. degree (Plan II - Comprehensive

Examination) is designed to serve as a terminal master's degree for students who wish to seek immediate employment in the computer field. Although it is specifically designed to serve as a terminal program, students who complete the program are in an excellent position to go on to study for the Ph.D. degree. Students with a good undergraduate background can complete the M.S. program in one year of full-time study. Special provisions are made to integrate this program into a five-year combined bachelor's-master's program.

3. Information Science

Information science in EECS 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, communication theory, and the propagation of acoustic and electromagnetic waves. 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 and the Department of Electrical Engineering and Computer 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 engineer-

ing, 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. Normally, no financial support is offered to students enrolled in the M.S. program.

A. Applied Physics

The M.S. program in applied physics is a flexible program that allows the students to deepen their understanding in the field of their choice.

Course Requirements

Math 210A-B-C or AMES 194A-B-C and any two sequences from the following:

- EECS 232A-B-C
- EECS 241A-B-C
- EECS 242A-B-C

B. Computer Science

In order to receive the M.S. degree in computer science, a student must complete the course requirements listed below and pass a comprehensive examination. The examination consists of two parts. Part I of the examination can normally be passed with a thorough knowledge of the topics covered in an undergraduate computer-science major. Part II of the examination covers more advanced graduate topics.

Course Requirements

- (a) EECS 264A-B-C
- (b) EECS 269 (3 units)
- (c) Two of the following three sequences
 - (i) EECS 270A-B
 - (ii) EECS 268A-B-C
 - (iii) EECS 265A-B-C

All the above courses must be completed with a grade-point average of 3.0.

Additional graduate courses to complete a total of thirty-six (36) units may be taken in EECS, mathematics, psychology, linguistics, and economics. A list of acceptable courses is available in the department office. The Plan I M.S. degree is not available in computer science.

C. Information Science

The M.S. program in information science stresses the mathematical princi-

ples and the analysis and design of modern communication systems. To complete the program, a student must satisfy the course requirements and pass a comprehensive examination. The comprehensive examination, which is held once a year late in the spring quarter, consists of a written part and an oral part. Students with a good undergraduate background can complete the program in one year of full-time study.

Course Requirements

- Math 210A-B-C
- EECS 250A-B-C or EECS 256A-B-C, and EECS 254A-B-C or EECS 258A-B-C

In addition, three quarters of elective courses must be taken. Any EECS, AMES, or mathematics graduate course or upper-division course is acceptable, subject to the consent of the graduate adviser.

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 EECS course on a satisfactory/unsatisfactory basis.

A. Applied Physics

1. Core Courses:
 - Math. 210A-B-C or AMES 294A-B-C, EECS 232A-B-C, and one of the following sequences:
 - EECS 241A-B-C
 - EECS 242A-B-C
 - Phys. 200A, 212A-B
2. Comprehensive Examination:

Students majoring in applied physics are required to take a written comprehensive examination after completing one year of graduate study at UC San Diego. The ex-

amination is based on the student's first-year graduate courses. It is offered twice a year, at the beginning of the fall and spring quarters, and lasts for two days, four hours per day. The examination may be repeated once. Students intending to take it must notify their graduate adviser before the fifth week of the winter quarter or the last week of the spring quarter.

B. Computer Science

1. Core Courses:
EECS 264A-B-C
EECS 265A-B-C and three quarters chosen from:
EECS 268A-B-C
EECS 270A-B-C
EECS 250A-B-C
Math. 200A-B-C
Math. 260A-B-C
Math. 270A-B-C

2. Comprehensive Examination:

Ph.D. students are required to take the same examination as the Master's degree candidates, but must pass it with a higher level of performance than that required of master's candidates. Students are expected to take this examination after completing one year of graduate study at UC San Diego.

C. Information Science

1. Core Courses:
Math. 210A-B-C
EECS 250A-B-C or EECS 256A-B-C,
and EECS 254A-B-C or EECS 258A-B-C

2. Comprehensive Examination:

Written and oral comprehensive examinations on upper-division and graduate material in communication theory, signal analysis, and random processes must be passed after the first year of graduate study. They will be given in the spring quarter.

D. 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 Applied Physics or Information Science. 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. This 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 EECS faculty members and one faculty member from SIO or AMES.

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, traineeships, loans, and assistantships. Stipends for half-time research assistantships are \$472 per month, with the possibility of full-time employment during the summer months. For a half-time teaching assistantship the stipend is \$598 per month. Requests for application forms for admission and financial support should be directed to the Department of Electrical Engineering and Computer Sciences.

Courses

All courses marked with an asterisk (*) are not offered in 1980-81. They are listed to help students plan for later years.

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*. EECS 61 and EECS 65 are interchangeable as prerequisites for other courses.

Lower Division

50A-B-C. Linear System and Circuit Analysis (4-4-4)
Network analysis, Kirchhoff's laws, transients and the steady state, step and impulse response, convolution integral. Sinusoidal steady state analysis, complex network impedance. Thevenin and Norton theorems. Concept of state. Fourier series, Fourier and Laplace transforms, applications. Three hours' lecture, three hours' laboratory. *Prerequisites: Phys 2B or 3B, and for EECS 50C, Math 2C is required* Mr. Lugannari

61. Introduction to Computer Science (4)

Introduction to problem solving by means of algorithmic processes; their implementation on digital computers. Topics include algorithms, transforming problem statements into algorithmic procedure, flowcharts, principles of programming languages and computing machines; principles of good programming, structured programming; data structures; PASCAL. Three hours' lecture, one hour's recitation. (A student who has taken EECS 65 may not take EECS 61 for credit.) (F.W.S.) Mr. Bowles (During 1980-81 Mr. Savitch)

63. Non-Numeric Applications of Computers (4)

Study of the use of computers for non-mathematical applications such as the accessing and processing of files and data bases. Areas of study include text processing, business data processing, graphics and communications. The language used is PASCAL. Three hours' lecture, two hours' recitation. *Prerequisite: EECS 61 or equivalent course emphasizing structured programming approved by the instructor.* (W) Mr. Bowles (During 1980-81 Mr. Burkhard)

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. *Prerequisites: Math 2B and EECS 61 or 65 or equivalent course emphasizing structured programming approved by the instructor.* (S) Mr. Hu

65. Introduction to Programming Theory (4)

Introduction to algorithm design and computer programming. Topics include structured programming, data structures, analysis of algorithms and elementary topics in numerical analysis. Designed to emphasize the mathematical aspects of algorithms, their applications and theoretical foundations of computer science. Three hours' lecture, one hour's recitation. *Prerequisite: Math 2A, concurrent registration permissible* (A student may not receive credit for both EECS 61 and EECS 65.) (W) 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 the tools for solving them. Constructive and creative thought about technology and its social impact. The course has no prerequisites; it is based on the hypothesis that the computer affects all of us and is important for everyone to understand. Three hours' lecture. (F) Mr. Fredman

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: Grade of A or B in EECS 61 or 65, or consent of instructor.* (F.W.S) Mr. Howden

Upper Division

105A. Introduction to Mathematical Physics (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. *Prerequisite: Math 2DA EA, Phys 2A B C or equivalent* Mr. Lewak

105B. Introduction to Mathematical Physics (4)

Special functions, eigenfunction problems, Fourier series, review of vectors, grad, div, curl, multi-dimensional integrals, Green's and Stokes's theorems, curvilinear coordinates, maxima, minima, calculus of variations, partial differential equations. *Prerequisite: EECS 105A* Mr. Lewak

105C. Introduction to Mathematical Physics (4)

Applications of material from EECS 105A and B, such as solutions of the wave, heat flow, and Poisson equations, Green's function methods. *Prerequisite: EECS 105B* Mr. Lewak

131A. Electromagnetism (4)

(E,D) fields, Gauss's law, electrostatic potential, Divergence, curl, (B,H) fields, Ampere's law. Similarities and differences between electric and magnetic fields. Biot-Savart law. Dis-

placement current. Electromotance. Faraday's law. Maxwell's equations. Scalar, vector, and Hertzian potentials. Current elements as dipoles. Radiation. Three hours' lecture, one hour's recitation. *Prerequisite: Phys 2B or 3B and Math 2C or consent of instructor.* (F) Mr. Booker

131B. Electromagnetism (4)

Electromagnetic equations in materials. Boundary conditions. Conductivity, electric and magnetic susceptibility. Real and complex dielectric constants and refractive indices. Refraction and reflection of plane waves at a plane interface. Evanescent waves. Models of dielectric, magnetic and conducting materials, including plasma. Three hours' lecture, one hour's recitation. *Prerequisite: EECS 131A.* (W) Mr. Booker

131C. Electromagnetism (4)

Electromagnetic energy, energy density, Poynting's vector and theorem. Storage and flow of energy in oscillatory circuits and oscillatory electromagnetic fields. Resistive, reactive and complex power, complex Poynting vector. Circuit and field impedance. The Lorentz transformation. Electromagnetic fields in moving materials. Three hours' lecture, one hour's recitation. *Prerequisite: EECS 131B.* (S) Mr. Booker

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 "Material Science Program" section.) (W) Mr. Arrhenius

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 2C or 3C and EECS 105 concurrently.* (W) 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 energy-band diagrams, general characteristic equations, device parameters, and various models. Three hours' lecture. *Prerequisite: EECS 135A.* (S) Mr. Chang

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. *Prerequisite: EECS 135A-B or equivalent.* (S) Mr. Chang

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. *Prerequisite: EECS 135A-B, 136A recommended.* Mr. Chang

137. Materials Laboratory (4)

A laboratory course covering experimental concepts and approaches in the study of materials, including preparation, processing, alloying, crystal growing, physical metallurgy, and various techniques in the evaluation and characterization of materials. (Part of "Materials Science Program," which see.) (S) Four to six hours' laboratory. *Prerequisite: some background in solid state physics or consent of instructor.* Mr. Luo

138. Digital Circuits Laboratory (4)

Introduction to standard integrated circuits for electrical engineers: gates, flip-flops, shift registers, counters, latches. Construction and debugging techniques. Design of digital systems such as fixed- and floating-point arithmetic modules, video displays. One hour's lecture, six hours' laboratory. *Prerequisite: EECS 70, or consent of instructor.* (Students who have taken EECS 175B may not take EECS 138 for credit.) (S) Mr. Appelbe

140A. Diffraction Informatics (4)

Acoustic and electromagnetic waves in one dimension. Reflection and transmission at a boundary. Multiple boundaries and design of impedance transformers. Reciprocity. Waves in three dimensions. Resonances of rectangular cavities. Transmission along rectangular waveguides. Dispersion of electromagnetic, acoustic and other waves. Three hours' lecture, two hours' recitation. *Prerequisites: Math 2D or 2DA and EECS 50C.* Concurrent registration in EECS 105A recommended. Mr. Rumsey

140B. Diffraction Informatics (4)

Fraunhofer patterns of arrays of point sources. Diffraction patterns as Fourier transforms and Huygens' Principle. Design of interferometers, telescopes, microscopes, antennas and acoustic radiators. Lenses as Fourier transformers. Fresnel diffraction and occultation. Three hours' lecture, two hours' recitation. *Prerequisite: EECS 140A or consent of instructor.* Concurrent registration in EECS 105B recommended. Mr. Rumsey

140C. Diffraction Informatics (4)

Fourier transforms and the angular spectrum of plane waves. Fresnel transforms and spherical waves. Elements of information processing using coherent and incoherent diffraction patterns. Images: Information stored in X-ray, optical, radio and acoustic diffraction patterns. Holography. Three hours' lecture, two hours' recitation. *Prerequisite: EECS 140B or consent of instructor.* Concurrent registration in EECS 105C recommended. Mr. Rumsey

141A. 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, four hours' laboratory. *Prerequisite: EECS 140C or consent of instructor.* Mr. Lee

141B. Laser 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, four hours' laboratory. *Prerequisite: EECS 140C or consent of instructor.* Mr. Lee

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, four hours' laboratory. *Prerequisite: consent of instructor.* Mr. Lee

142AL-BL-CL. Acoustics Laboratory (4-4-4)

Experiments in acoustics. Vibrations and waves in strings and bars. Response of electro-mechanical systems. Transducer calibrations. Propagation, reflection, refraction, and scattering of underwater sound waves. Four hours' laboratory, one hour's lecture. *Prerequisites: concurrent registration in EECS 140A-B-C or consent of instructor.* Mr. Anderson

146A. Electronic Systems and Circuits (4)

Stability of feedback systems and design of active circuits. Theory of semiconductor devices, design of analog integrated circuits. Analog instrumentation. Three hours' lecture, three hours' laboratory. *Prerequisites: EECS 50A-B-C and EECS or AMES 105A-B-C.* Concurrent registration in EECS 146AL recommended. Mr. Coles

146B. Electronic Systems and Circuits (4)

Electronic characteristics of digital hardware. Design of hybrid systems. Analog-digital conversion techniques. Phase-locked systems. Design of modems. Transmission line effects in digital systems. Three hours' lecture, three hours' laboratory. *Prerequisite: EECS 146A.* Concurrent registration in EECS 146BL recommended. Mr. Coles

146C. Electronic Systems and Circuits (4)

Design of RF/IF and microwave electronics. Low noise systems. Frequency translation and modulation. Distributed systems. Microwave semiconductor devices. Three hours' lecture, three hours' laboratory. *Prerequisite: EECS 146A.* Concurrent registration in EECS 146CL recommended. Mr. Coles

146AL-BL-CL. Electronics Laboratory (2-2-2)

Laboratory projects on material covered in EECS 146A-B-C. Four hours' laboratory. *Prerequisites: concurrent registration in EECS 146A-B-C, required.* Mr. Coles

152A-B-C. Signal Analysis (4-4-4)

Fourier series and transform, sampling representation, linear systems, filters, z transforms, feedback systems. Random variables, probability distributions, expected values. Correlation functions and spectral densities of stochastic processes, the Gaussian process, random noise in linear systems. *Prerequisites: EECS 50A-B-C.* Mr. Helstrom

154A-B-C. Communications Systems (4-4-4)

Review of probability and random processes. Optimum filtering, prediction, and signal detection. Analog modulation and demodulation, AM, FM, PM, signal-to-noise ratio, performance analysis. Digital communication systems, sampling, quantizing, PAM, PCM, PSK, probability of error, quantizing errors, intersymbol interference. Three hours' lecture, one hour's recitation. *Prerequisites: EECS 152A-B-C.* Mr. Milstein

159A-B-C. Queuing Systems (4-4-4)

Introduction to queuing theory and its applications in the areas of management science, computer and communication systems. Review of probability theory. Analysis of queuing systems: queue length, waiting time and busy period. Bulk queues and priority disciplines. Economic models and parameter optimization. Applications to industrial waiting line problems; inventory systems; computer timesharing models; telephone systems. Three hours' lecture. *Prerequisite: Mathematics 2D or consent of instructor.* Mr. Masry

160A-B. Foundations of Computer Science (4-4)

Permutations and combinations; generating functions, recurrence relations; introduction to graph theory; introduction to rings and fields; Polyá's theory of counting; predicate calculus; applications to topics in computer science including the design and analysis of algorithms. Three hours' lecture. *Prerequisite: grade of A or B in EECS 70 or consent of instructor.* (F,W) Mr. Hu and staff

161A-B-C. Digital System Software (4-4-4)

Principles of software design. Assemblers, macroprocessors, input-output, information structures, linear structures, sequential and linked allocations, searching techniques, scatter storage, trees, traversals, AVL trees, Huffman trees; sorting, compilers, lexical analysis, symbol tables, context-free grammars, parsing, syntax-directed translation, code optimization. Three hours' lecture, two hours' recitation. *Prerequisites: EECS 61 or 65, grade of A or B in EECS 70, EECS 160A (may be taken concurrently) For EECS 161C, EECS 175A is prerequisite.* Mr. Burkhard

165. Algorithms, Automata and Formal Languages (4)

Introduction to the notions of formal computations: Turing machines, register machines, recursive functions, the halting problem, minimal instruction sets which realize a universal computer, introduction to Turing machine time and tape hierarchies. Three hours' lecture. *Prerequisite: EECS 161C or consent of instructor.* (S) Mr. Savitch

*166. Numerical Algorithms (4)

Computational error, Taylor series, interpolation, solution of equations, numerical integrations, systems of equations, eigenvalue problems, some applications to numerical solution of ordinary differential equations, introduction to partial differential equations; practice in programming applications of these topics. Three hours' lecture. *Prerequisites: EECS 61 or 65, and Math. 2C-2D-2E or 2DA-2EA.* (W)

170A-B. Principles of Computer System Design (4-4)

Combinational and sequential digital logic design. Data representations and computer arithmetic. Register-transfer language, implementation of micro-operation sequences using standard integrated circuits. CPU organization, busses, microprocessors. Micro-program control. Memory organization input/output, interrupts, direct memory access. Three hours' lecture. *Prerequisite: grade of A or B in EECS 70 or consent of instructor.* (F,W) Mr. Fredman

171A-B. Principles of Computer Operating Systems (4-4)

Batch systems, multiprogramming, procedure implementation, processes, parallelism, critical sections, deadlocks, communication, multiprocessing, multi-level memory management, binding, name management, file systems, protection, resource allocation, scheduling. Three hours' lecture. *Prerequisite: EECS 170A.* (W,S) Mr. Howden

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: EECS 61 or 65, and EECS 70 or consent of instructor.* (F) Mr. Appelbe

175A. Computer Science Laboratory (4)

Direct manipulation of a small computer in a laboratory environment. Assembly language programming. A study of the tools for system programming. One hour's lecture, three hours' laboratory. *Prerequisite: EECS 161A, 161B (may be taken concurrently).* (W) Mr. Burkhard

175B. Digital Hardware Laboratory (4)

Introduction to standard integrated circuits: gates, flip-flops, shift registers, counters, latches. Construction and debugging techniques. Design of digital systems such as fixed and floating-point arithmetic modules, video displays, digital stopwatch and tachometer. One hour's lecture, six hours' laboratory. *Prerequisite:* EECS 170A (may be taken concurrently) or consent of instructor. (Students who have taken EECS 138 may not take EECS 175B for credit.) Mr. Appelbe

175C. Microprocessor Systems Design (4)

Writing and debugging programs on a microprocessor development system. Timing and loading considerations in 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:* EECS 170B (may be taken concurrently), EECS 70 or equivalent, and EECS 175B or equivalent. (W) Mr. Appelbe

178. Artificial Intelligence (4)

Steps toward intelligent machine behavior. General problem solving heuristics, tree-searching algorithms, theorem proving programs, game-playing programs. Appropriate programming languages. Three hours' lecture. *Prerequisites:* EECS 61 or 65, and consent of instructor. (W) Mr. Fredman

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. Three hours' lecture. *Prerequisites:* EECS 160A-B and 161A-B. (S) Mr. Fredman

195. Teaching (2 or 4)

Teaching and tutorial activities associated with courses and seminars. Not more than four units of EECS 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 Engineering and Computer Science (4, 8, 12, or 16)

Directed study and research at laboratories and observatories away from the campus. *Prerequisites:* consent of instructor and approval of the department.

198. Directed Group Study (2 or 4)

Topics in electrical engineering or computer sciences 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

232A-B-C. Applied Electromagnetic Theory (3-3-3)

General solution of Maxwell's equations and the transmission and reception of electromagnetic waves via antennas, waveguides and representative homogeneous and inhomogeneous media, at radio and optical wavelengths. Propagation via the atmosphere, ionosphere, troposphere, and magnetosphere and the interplanetary and interstellar media. Reciprocity and equivalence theorems. Mr. Rickett

236. Space Research and the New Astrophysics (3)

Survey of new approach to astrophysics based on results of space research. Relations between laboratory physics and astrophysics. Electric and magnetic fields; magnetosphere, jet streams of solid bodies in space; asteroids, comets, meteoroids. Evolution of solar system. Galactic plasmas. Cosmology. (W) Mr. Alfvén

240A-B-C. Solid State Electronics. (3)

The course sequence is designed to provide a general background in solid state electronic materials and devices. Subjects include semiconductor physics and devices, dielectric and ferroelectric materials, magnetism, and other special topics. *Prerequisites:* fundamentals of quantum mechanics, EECS 131C or equivalent. Mr. Chang

241A. Optics I (3)

Propagation of waves and rays in various media, homogeneous, inhomogeneous (e.g. media with gradient index or lenslike media), anisotropic, nonlinear media. Optical

dielectric waveguides, fiber optics, electro-optics, nonlinear optics, acousto-optics. Optical resonators and mode stability criteria. *Prerequisite:* EECS 140C or consent of instructor. (F) Mr. Lee

241B. Optics II (3)

Optical information processing. Space-band with product, super-resolution, space-variant optical system, partial coherence, image processing with coherent and incoherent light, processing with feedback, real-time light modulators for hybrid processing, nonlinear processing. Optical computing and other applications. *Prerequisite:* consent of instructor. (W) Mr. Lee

241C. Optics III (3)

Lasers and holography. Laser oscillation and amplification, Q-switching and mode locking of lasers, some specific laser systems. Optical display and memory, holography, computer holography, color holography, real-time holography. Imaging through fog with holography, holographic microscopy, non-destructive testing with holography. *Prerequisite:* consent of instructor. (S) Mr. Lee

242A. Advanced Acoustics I (3)

Boundary value problems in vibrating systems, wave propagation in strings, bars, and plates. Fundamentals of acoustic transducers. *Prerequisite:* concurrent registration in 142AL recommended. Mr. Anderson

242B. Advanced Acoustics II (3)

Theory of radiation, transmission and scattering of sound with special application to ocean acoustics. *Prerequisites:* concurrent registration in 142BL recommended. EECS 242A or consent of instructor. Mr. Anderson

242C. Advanced Acoustics III (3)

Signal processing in underwater acoustics. Theory and hardware embodiments. *Prerequisites:* concurrent registration in 142CL recommended. EECS 242B or consent of instructor. Mr. Anderson

***243A-B. Optical Systems (3-3)**

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

***246. Wave Propagation through Random Media (3)**

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. Rumsey

***248A-B. Electromagnetic Propagation in Stratified Atmospheric Layers (3-3)**

Propagation in plane-stratified ionosphere without and with the Earth's magnetic field. Real and complex ray theory. The WKB approximation. The mode theory of propagation between the Earth and the ionosphere. Refraction and diffraction in the troposphere. Scattering. *Prerequisite:* EECS 232 or consent of instructor. Mr. Booker

250A-B-C. Mathematical Models for Random Processes (3-3-3)

Study of random processes emphasizing their relationship to the models that generate them. Characterization of probability laws, filtering, estimation, limit theorems. Brownian motion, Poisson processes, shot noise. Markov processes, counting processes, and linear processes. *Prerequisite:* EECS 152C or equivalent or consent of instructor. (Given in alternate years.) (F,W,S) Mr. Lugannani

251A. Digital Signal Processing I (3)

Sampling, A/D and D/A conversion, discrete linear system theory, z transforms, digital filters, recursive and nonrecursive designs, quantization effects, fast Fourier transforms, windowing, high speed correlation and convoluting, discrete random signals, finite word length effects. *Prerequisite:* EECS 152A B C or equivalent. Mr. Hodgkiss

251B. Digital Signal Processing II (3)

Power spectrum estimation, homomorphic signal processing, applications to speech, radar-sonar, picture, biomedical, and geophysical data processing. *Prerequisite:* EECS 251A or consent of instructor. Mr. Hodgkiss

251C. Digital Signal Processing III (3)

Signal and multi-channel data processing in a time varying environment, adaptive filters, high resolution spectral estimation, linear prediction, adaptive beamforming. *Prerequisites:* EECS 251A-B or consent of instructor. Mr. Hodgkiss

254A-B-C. Detection Theory (3-3-3)

Hypothesis testing, detection of signals in white and colored Gaussian noise; Karhunen-Loève expansion, estimation of signal parameters, maximum-likelihood detection, resolution of signals; detection and estimation of stochastic signals; applications to radar, communications, and optics. *Prerequisite:* EECS 152C. (Given in alternate years) Mr. Helstrom

***256A-B-C. Time Series Theory and Applications (3-3-3)**

Second order random processes, processes with orthogonal increments, spectral representation, series expansion. Time series analysis: covariance and spectral estimation. Mean-square recursive and nonrecursive filtering, Wiener-Hopf and Kalman-Bucy filters. *Prerequisites:* EECS 152A-B-C and Math 210A-B-C. (Math 210 may be taken concurrently.) (Given in alternate years.) Mr. Masry

***258A-B-C. Communication Systems (3-3-3)**

Fundamental concepts of information theory, including information measures, source encoding with and without distortion, channel encoding, noisy channel coding theorem. Digital communication theory including basic modulation techniques, performance of digital systems, effects of and equalization techniques for intersymbol interference, spread-spectrum communications. *Prerequisite:* EECS 154A-B-C or consent of instructor. (Given in alternate years.) Mr. Milstein

264A. Software Engineering (3)

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:* EECS 161A-B C, EECS 171A, or consent of instructor. Mr. Howden

264B. Advanced Operating Systems (3)

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:* EECS 171A-B or consent of instructor. Mr. Howden

264C. Advanced Compiler Design (3)

Advanced material in programming languages and translator systems. Topics include compilers, code optimization and debugging interpreters. *Prerequisites:* EECS 161A-B C or consent of instructor. Mr. Howden

264D. Database Systems (3)

Database models including relational, hierarchic and network approaches. Implementation of databases including query languages and system architectures. *Prerequisite:* EECS 161A-B-C or consent of instructor. Mr. Burkhard

265A-B-C. Automata, Formal Languages, and Complexity Theory (3-3-3)

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. Mr. Savitch

268A-B-C. Combinatorial and Searching Algorithms (3-3-3)

Combinatorial and searching algorithms and their computer implementation. Network flow problems such as the analysis of multi-terminal network flows, decomposition algorithms for shortest paths, advanced data structures for information retrieval, optimal search trees, geometrical search algorithms, and other current problems. *Prerequisite:* consent of instructor. Mr. Hu

269. Special Project in Computer Science (1-6)

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. 1-6 units, may be repeated to a total of 9 units. *Prerequisite:* admission to the MS program in Computer Science. Mr. Fredman

Engineering

270A-B. Concepts in Computer Architecture (3-3)

Computer arithmetic, instruction look-ahead, and pipelining, paging and segmentation, cache memories and associative memories, I/O controllers, graphic displays, multi-processors and distributed processors, stack and high-level-language machines, array and parallel processing. *Prerequisite: EECS 170A or consent of instructor.* (Given in alternate years.) Mr. Appelbe

278. Topic in Artificial Intelligence (3)

General problem solving programs, game-playing programs, Pattern recognition and natural language processing, Knowledge representation and theorem-proving programs. *Prerequisite: consent of instructor.* Mr. Appelbe

280. Special Studies in Computer Science (1-3*)

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. *May be repeated for credit. *Prerequisite: consent of instructor.*

281. Special Topics in Computer Science. (1-6*)

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. *May be repeated for credit. (Satisfactory/Unsatisfactory grades optional.) *Prerequisite: consent of instructor*

M285. Special Topics in National Security for Science Students (3)

The seminar will consist of two parts: first, a presentation of what our national security policy is; and second, a discussion of how various current science and technology programs and policies relate to it. Mr. York

287A-B-C. Special Studies in Information Science (1-3)

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. (Satisfactory/Unsatisfactory grades optional.) *Prerequisite: consent of instructor*

289. Special Topics in Information Science (1-6)

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. (Satisfactory/Unsatisfactory 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 (1-1-1)

Weekly discussion of current research literature. Staff

292. Graduate Seminar in Solar System and Space Physics (1-1-1)

Research topics in radio astronomy and solar system physics (S-U grades only.) Mr. Rickett

293. Graduate Seminar in Information and Computer Science (1)

Research topics in information and computer science. Staff

294. Graduate Seminar in Applied Solid State Physics (1)

Research topics in applied solid state physics and quantum electronics. Mr. Luo

295. Graduate Seminar on Space Research and the New Astrophysics (1)

A survey is given of the new approach to astrophysics that is based on the results of space research. Mr. Alfvén

296. Graduate Seminar in Optical Signal Processing (1)

Research topics of current interest in holography. Mr. Lee

298. Independent Study (1-12)

Open to properly qualified graduate students who wish to pursue a problem through advanced study under the direc-

tion of a member of the staff. (S-U grades permitted.) *Prerequisite: consent of instructor.*

299. Research (1-12)

501. Teaching (1-4)

Teaching and tutorial activities associated with courses and seminars. Not required for candidates for the Ph.D. degree. Number of units for credit depends on number of hours devoted to class or section assistance. *Prerequisite: consent of department chairman.*

*Not offered in 1980-81. Listed to help students plan for later years.

ENGINEERING

The following undergraduate programs in engineering are offered at the University of California, San Diego. Details are to be found in the sections devoted to the sponsoring departments.

Applied Mechanics — see Applied Mechanics and Engineering Sciences

Bioengineering — see Applied Mechanics and Engineering Sciences

Chemical Engineering — see Applied Mechanics and Engineering Sciences

Computer Engineering — see Electrical Engineering and Computer Sciences

Electrical Engineering — see Electrical Engineering and Computer Sciences

Engineering Sciences — see Applied Mechanics and Engineering Sciences

Engineering Physics — see Electrical Engineering and Computer Sciences

Systems Science — see Applied Mechanics and Engineering Sciences

ENGLISH AND AMERICAN LITERATURE

See Literature

FRONTIERS OF SCIENCE

OFFICE: 1512 Humanities-Library Building, Revelle College

This sequence of courses is designed to be used as a noncontiguous minor by Revelle College students who are not majoring in the sciences. However, inasmuch as the sequence will be given at the upper-division level, a knowledge of the material covered in a Revelle College lower-division sequence in the natural sciences will be presupposed.

Prerequisites for all Frontiers of Science courses: junior standing and completion of Revelle's natural science requirement or equivalent, or consent of instructor.

Courses

104. Politics and Technology of the Arms Race (4)

The technological, political, and strategic ideas that underline both the nuclear arms race and the attempts to control it will be discussed in historical perspective. Current attempts to limit strategic armaments also will be examined. *Prerequisites: junior or senior standing and lower division science desirable.* (Not offered in 1980-81.)

108. Biochemical Anthropology and Individuality (4)

Reconstruction of migrations of different ethnic groups will be discussed with respect to various biochemical tests. Biochemical variations due to genetic differences in human populations will also be discussed from the point of view of both disease and a changing environment. The evolutionary factors which influence biochemical changes in man will be compared to other species. A summary will be made of the concepts of biochemical individuality as related in our society as well as its impact on the practice of medicine.

118. Metaphysics (4)

Order and disorder in human existence. The human universe and scientific universe are inseparably linked. Realization of this unity is essential for survival. This course will investigate several seemingly diverse disciplines, giving the student the opportunity to gain an understanding and appreciation for both complementarity and unity.

119A. Energy: Demands, Resources, Impact, Technology, and Policy (4)

Part and estimated future energy demands. Renewable and nonrenewable energy resources. Economic impact of energy use. Environmental impact of energy use. Energy conservation in manufacturing, transportation, home use. Energy policy. *Prerequisites: completion of lower-division science and mathematics sequence in Revelle or equivalent and junior standing.* This course replaces Front. of Sci. 119. (F)

119B. Energy: Nonnuclear Energy Technologies (4)

Oil recovery from tar sands and oil shale. Coal production, gasification, liquifaction. 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: Front. of Sci. 119A.* (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. *Prerequisites: Front. of Sci. 119A-B.* This course replaces Front. of Sci. 121. (S)

120. History, Science, and Technology in Marine Archaeology (4)

History, prehistory, geological and marine science, and technology in marine archaeology. Sub-marine search, technologies, ocean currents, marine weather, chemistry, dating techniques, etc., are interrelated with history and prehistory of marine peoples and with discoveries in, and the future of, marine archaeology.

127. Understanding Earthquake Hazard (4)

This course will deal with elementary physical concepts necessary for understanding earthquake hazard. Topics will include earthquake causes, mechanism, probability, prediction, and ways of reducing earthquake hazard. The course will include discussions of public policy concerning building design, siting of nuclear reactors, and other critical structures. *Prerequisites: upper-division standing and completion of Revelle math and science requirements or equivalent.*

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.

130. Urban and Wildland Fire Phenomenology (4)

This course will emphasize basic aspects of fire as a phenomenon and will touch only peripherally on its economic impact and social implications. Attention will be given to the physics, chemical equilibria, chemical kinetics, fluid dynamics, transport properties, and heat and mass transfer that occur in fires. Prediction of fire histories and the development of methods for fire control will be reviewed.

131. The Common Ground of Art and Science (4)

This introductory course will explore some of the ground common to art and science. Archaeological evidence leads to a picture of the development of certain technologies through their connection with art. This relationship will be traced from antiquity to the present, with examples from metallurgy, mathematics, alchemy, astronomy, and physics.

132. Foods and Nutrition (4)

This course will be concerned with a broad look at the history of foods, their preservation and distribution. The understanding of food is but a precursor to understanding the fundamental biological basis of nutrition, which will include a study of the digestive and assimilative aspects of human metabolism, as well as the necessary nutrients demanded by a human organism for proper growth and development. Both excesses and deficiencies of the various substances will be studied. A careful look at food fetishes, fads, and fancies will be examined.

133. Dimensions of Consciousness (4)

Creatively spanning the realms of integrative brain research, this course surveys the biological, cultural, and psychological dimensions of consciousness. The course presents authorities from many institutions who will highlight the frontiers of neuroscience against a background of humanities and arts. Its interdisciplinary approach transcends traditional boundaries, reflecting the dimensions emergent from our study of the mind. A student-organized presentation.

134. Conservation — the Preservation of Endangered Species (4)

The preservation of endangered species will be considered from the perspectives of ecology, population genetics, and public policy.

HISTORY

OFFICE: Room 5024 Humanities and
Social Science Building, Muir College

Professors:

Stanley Chodorow, Ph.D.
H. Stuart Hughes, Ph.D.
Gabriel Jackson, Ph.D.
Thomas Metzger, Ph.D.
Allan Mitchell, Ph.D. (*Chairman*)
Earl Pomeroy, Ph.D.
Armin Rappaport, Ph.D.
Ramon Eduardo Ruiz, Ph.D.
††Harry N. Scheiber, Ph.D.
***James R. Scobie, Ph.D.

Research Associate:

Leften Stavrianos, Ph.D.

Associate Professors:

Judith M. Hughes, Ph.D.
David S. Luft, Ph.D.
Alden A. Mosshammer, Ph.D.
Michael E. Parrish, Ph.D.
Edward Reynolds, Ph.D.
David C. Ringrose, Ph.D.
*Robert C. Ritchie, Ph.D.

Assistant Professors:

*Thomas Dublin, Ph.D.
Robert S. Edelman, Ph.D.
†John A. Marino, Ph.D.
Michael P. Monteon, Ph.D.
††Kathryn Norberg, Ph.D.
**Paul G. Pickowicz, Ph.D.
Ricardo Romo, Ph.D.
Emory J. Tolbert, Ph.D.

*Leave of Absence, 1980-81

†Leave of Absence, winter, spring 1981

**Leave of Absence, fall, 1980

††Leave of Absence, spring, 1981

***Leave of Absence, fall, winter 1980-81

The Major Program

Students majoring in the Department of History are required to take (1) three quarters of lower-division work and (2) a minimum of twelve upper-division courses in history. The upper-division courses must be distributed among the three fields offered by the department. Students must maintain a C average in history courses to graduate in this major.

PREREQUISITES

History 1A-1B-1C

(Comparative History of the Americas)

or

History 3A-3B-3C (European Society and
Social Thought)

or

History 7A-7B-7C (Race and Ethnicity in
the United States: A Comparative Study).

NOTE: Transfer students who have taken a two-semester or three-quarter, lower-division history sequence elsewhere may petition to waive the lower-division requirement for the major.

Fields

1. Europe
2. Western Hemisphere (United States and Latin America)
3. Non-Western History (Africa and Asia)

Students will fulfill a distribution requirement as follows:

1. seven-quarter courses in one of the three fields;
2. three quarter-courses in a field other than the primary one;
3. two quarter-courses in one of the remaining fields.

Special Major Program in Social and Economic History

Students may concentrate on social and economic history. The twelve courses in this major program shall be distributed as follows:

1. Three courses in economic history.
2. Four courses in social history; the list of these courses is available through the departmental undergraduate advisers.
3. Two colloquia in social or economic history. These courses may be divided between the two fields.
4. Three courses outside social and economic history.

History majors are urged to take courses in related disciplines to enhance their understanding of the historical process and to strengthen their preparation in the major. Such courses should be selected in consultation with an adviser.

Honors

The department offers a special program for outstanding students. Candidates for history honors are chosen during the spring quarter 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 upon 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 1.

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 (History 196A). During the winter quarter the student pursues a course of independent study devoted to the completion of the honors essay (History 196B). 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. History 196Q. Colloquium in History;
4. History 196A-B. History Honors — Honors Essay.

History 196A. History Honors

A program of independent study providing candidates for history honors with an opportunity to develop, in consultation with an adviser, a preliminary proposal for the honors essay.

History 196B. The Honors Essay

Independent study under the supervision of a faculty member, leading to the preparation of an honors essay.

History 196Q. Colloquium in History

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 historians. Required of all candidates for history honors and open to other interested students with the instructor's permission.

The Graduate Program

MASTER'S DEGREE 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 Third World, African, Chinese, and other fields. (See details below.) Applicants must submit their academic record, 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 somewhat better grades in history and related subjects. Students may be admitted to regular candidacy in the fall quarter only. Students wishing information regarding the possibility of part-time M.A. study should contact the department's graduate secretary. The deadline for making 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, and certain special areas must demonstrate reading knowledge of at least one foreign language relevant to their course work. A score of 600 or above on the Educational Testing Service language examination satisfies this requirement.

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:

- I. History 208A-B-C. Central Problems of European History: 1500-1945. All entering graduate students in European history take these courses.
- II. Two of the courses must be in preindustrial Europe.
- III. Two of the courses must be in industrial Europe.
- IV. Two of the courses must be colloquia or a research seminar.
- V. 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 opportunities to specialize further in Argentina, Brazil, Cuba, or Mexico. Advanced work in another discipline related to Latin America may also be included in the program. The nine courses (thirty-six units) normally should be distributed as follows:

- I. History 240A-B-C. Literature of Latin American History. Required of all entering graduate students in Latin American history.
- II. Four Latin American history courses, including graduate seminars if appropriate to the student's plan of work.
- III. Two courses (related to Latin America) from other areas of history or from 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:

- I. History 250A-B-C. The Literature of American History. These colloquia are required of all entering graduate students in American history.
- II. Two courses in a single topical field — diplomatic, economic, social and ethnic (including urban) history, the American West, or legal and constitutional history.
- III. Four additional courses chosen in consultation with the student's adviser. Two of these may be in a related field outside the department.
- IV. At least five 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, or China, can develop an M.A. program in conjunction with an appropriate faculty member and petition the department for approval.

Ph.D. PROGRAM

Admission: The Department of History offers the Doctor of Philosophy degree in the fields of European history, Latin American history, and United States history.

Applicants for admission to these programs must submit their academic record, three letters of recommendation, Graduate Record Examination scores (aptitude only), 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, 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 making application is January 15.

Fields of Study: During the first quarter 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 the 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 England, Spain, France, Germany, social history, economic history, diplomatic history, or intellectual history.
 2. Early Modern Europe with a specialty in expansion of Europe or any of the above.
 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. England
 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

- A. Major Fields
1. The national period of Latin America with a specialty in Argentina, Brazil, Cuba, Mexico, or socio-economic history.
 2. Colonial Latin America with an emphasis on economic history or political institutions.
- 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. Spain
 2. United States
 3. Another geographic area outside Latin America
 4. Expansion of Europe
 5. A related discipline

III. UNITED STATES HISTORY

- A. Major Fields
1. Colonial and early American period to 1789
 2. National period, 1789-1877
 3. Modern America, 1877 to present

4. Diplomatic history
5. Economic history
6. The American West
7. Social history
8. Legal and constitutional history

- B. First Minor
1. Any of the fields listed above. Of the two fields required in United States history, one must be a chronological field.
 2. Ethnic-urban history
- C. Second Minor
1. A geographical area outside the United States
 2. A related discipline

NOTE: The department also offers graduate work in African and Chinese history. When appropriate, students may select minor fields in these areas.

Language Requirements: Students satisfy the foreign-language requirement by achieving a score of 600 or higher on the Educational Testing Service language examinations. In the few cases in which the ETS examination is not appropriate, the department will prepare a special language examination.

1. Ph.D. candidates in European history must pass two foreign-language examinations. Other languages may be required when necessary for dissertation research. Students in British history may petition for the reduction of the language requirement to one.
2. Candidates in Latin American history must pass one foreign-language examination. A second language may be required when necessary for dissertation research.
3. Candidates in United States history need not pass a foreign-language examination. When relevant, a thesis adviser in this field may require the passing of such an examination.

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 in European or Latin American history 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. A Ph.D. candidate

who is not a teaching assistant, but is burdened by outside employment or family responsibilities, may petition for a reduction of the course load to nine units per quarter. Students are expected to complete the following minimum of formal courses prior to their examinations: two two-quarter research seminars, 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. Students are encouraged to take at least one colloquium or research seminar in their major field during the initial year of graduate study.

Apprentice Teaching and Research:

As preparation for an academic career, Ph.D. candidates in history are expected to serve as teaching assistants. In certain cases, a student may instead participate in some special research program. Such training, for which students earn regular academic credit, is an integral part of the graduate program at UC San Diego.

Examinations: Ph.D. candidates must take at least one examination in the spring of their second year and complete all examinations by January of their third year. Minor field examinations are written; the major field examination is oral. In each minor field, one professor will, in consultation with colleagues, 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 UC San Diego, 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, teaching assistantships, and readerships. Graduate students are eligible for one or a combination of the four forms of financial support for three years while in the program. Fellowships and research assistantships are granted by the Graduate Division on the recommendation of the Committee on Graduate Matters. 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.

Courses

Lower Division

The Department of History regularly participates in several interdisciplinary programs offered at the university: the Humanities sequence (Revelle College), Cultural Traditions (Muir College), Third World Studies (Third College), Chicano Studies, Chinese Studies, Classical Studies, and Judaic Studies. Students should also consult the listings of these programs elsewhere in the catalog.

1A-B-C. Comparative History of the Americas (4-4-4)
A lecture discussion course on the comparative history of Latin America and the United States from the pre-Columbian period to the present. Through lectures, panel discussions, and readings, students will compare and contrast selected

aspects of the political systems, economic developments, and cultural currents in the Americas. Among the topics to be covered are patterns of conquest, slavery and race relations, the impact of technology, war, and imperialism. (Satisfies Revelle and Muir College humanities requirements.) Staff.

3A-B-C. European Society and Social Thought (4-4-4)
Examination by lectures and discussion 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 Revelle and Muir College humanities requirements.) Staff.

7A-B-C. Race and Ethnicity in the United States: A Comparative Study (4-4-4)

A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be slavery, race, oppression, mass migrations, ethnicity, city life in industrial America, power and protest in modern America, Mexican-American, the Black, Asian-American, and White ethnic groups. (This course is also listed as Third World Studies 7A-B-C. Satisfies Third College general-education requirement.) Staff.

19A-B-C. The Greco-Roman World (4-4-4)

An introductory study of the Greco-Roman world, its literature, myth, philosophy, history, and art. (Cross-listed with Literature/Classical Studies.) Staff.

24. Origins & Consequences of Underdevelopment (4)

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 of imperialism. Reynolds.

25. China and the West in Modern Times (4)

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. Metzger.

26. Third World: Nationalist Rebellions and Economic Development (4)

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 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, Kenya, and Chile are among the cases that will be examined in detail. Monteon.

31. Environment and Economy in Historical Perspective, Part I (4)

Interaction of man and the environment. Disease, geography, technology, and climate as determinants. Man's culture and impact on his ecological context from various past and present contexts. The course emphasizes the historical, archaeological, and anthropological record and social-science models of explanation. (This course is part of a sequence in the Contemporary Issues program of Muir College.) Ringrose.

32. Environment and Economy in Historical Perspective, Part II (4)

Interaction of man and the environment. Disease, geography, technology, and climate as determinants. Man's culture and impact on his ecological context from various past and present contexts. The course emphasizes ethical positions and attitudes to environment, the possible uniqueness of the West, and the environmental movement of the last century. (This course is part of a sequence in the Contemporary Issues program of Muir College.) Ringrose.

35. Lords and Peasants (4)

A comparative treatment of the transformation from a feudal to capitalist base of the rural life and economy of East and West Europe. (Not offered in 1980-81.) Edelman.

43. A History of American Expansion (4)

A lecture course describing and analyzing the expansion of the United States on the American continent and overseas — from a continental republic to an American empire. Attention will be given to the intellectual, cultural, economic, and political factors which underlay the movement for expansion. Rappaport.

44. The History of the Pacific Ocean (4)

This course will cover the natural history of the Pacific; the immigration of peoples around and across the Pacific; the ways in which various societies have exploited its resources, and the competition to control its resources. (Not offered in 1980-81.) Ritchie.

Upper Division

Completion of a college writing requirement is a prerequisite for admission to upper-division history courses. Immediately following the names of the instructors, the symbols (E), (NW), or (W) appear. They represent: (E) = European; (NW) = Non-Western; (W) = Western.

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 (1900-445 B.C.). (Not offered in 1980-81.) Mosshammer. (NW)

101A. 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. (E)

101B. 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.). (Not offered in 1980-81.) Mosshammer. (E)

101Q. Special Topics in Greek History (4)

See *Colloquia* below.

102A-B. The Roman Republic and Empire (4-4)

The political, economic, and intellectual history of the Roman world from the foundation of Rome to the death of Constantine. Mosshammer. (E)

102Q. Special Topics in Roman History (4)

See *Colloquia* below.

103A-B. Medieval England (4-4)

Course covers the history of England from Roman times to the fourteenth century. Students will study the development of English government, society, and culture. Chodorow. (E)

104A-B. The Rise of Europe (4-4)

The development of European society and culture from the decline of the Roman Empire to 1300. *Prerequisite: Humanities sequence or its equivalent.* (Not offered in 1980-81.) Chodorow. (E)

104Q. Special Topics in Medieval History (4)

See *Colloquia* below.

105A-B. Renaissance Italy, 1348-1564 (4-4)

The intellectual, political, and economic transformation of late-medieval Italy from the Plague to the Council of Trent. (Not offered in 1980-81.) Marino. (E)

105Q. Special Topics in the History of Early Modern Europe (4)

See *Colloquia* below.

106A. Reformation Europe, 1494-1598 (4)

The intellectual and social history of the reformation and counter-reformation movements 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. Marino. (E)

106B. Northern European Renaissance, 1500-1616 (4)

The intellectual, political, economic, and social transformation of northern Europe during the sixteenth century. Emphasis is upon the new monarchies and the state, the origin of capitalism, as well as humanism and culture in the North. (Not offered in 1980-81.) Marino. (E)

106Q. Central Problems in European History from 1500-1715 (4)

See *Colloquia* below.

History

140C. Latin America in the Twentieth Century

Twentieth-century development with attention to themes of industrialization, dependency, military organization, and relations with the United States. Case studies of Argentina, Brazil, Cuba, and Mexico. (Not offered in 1980-81.) Scobie (W)

143. Brazil: Colony, Empire, Republic (4)

Lectures, discussion, and readings focus on the socio-economic and political transformation of this former Portuguese colony into a major Latin American power (1500-present). (Not offered in 1980-81.) Scobie (W)

144. Argentine Growth and Development (4)

Following an introduction to the economy and society of the Rio de la Plata area from 1500-1850, the lectures and discussions will emphasize political development, economic growth, and social change of modern-day Argentina. (Not offered in 1980-81.) Scobie (W)

145. Machismo and Matriarchy: 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. Monteon (W)

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. Ruiz (W)

146Q. Topics in Latin-American History, 1810-1910 (4)

See *Colloquia* below.

147. 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. (Not offered in 1980-81.) Ruiz (W)

147Q. Topics in Latin-American History, since 1910 (4)

See *Colloquia* below.

148A. The Urban Culture of South America, 1830-1920 (4)

The course will compare contemporary social science theories of urban development with the historical experience of several nineteenth-century primary cities in South America: Lima, Santiago de Chile, Rio de Janeiro, Sao Paulo, and Buenos Aires. Specific topics of discussion will include the city as an administrative and economic center, the influence of intellectuals in altering a traditional culture, and the rise of labor radicalism and urban mass politics. (Not offered in 1980-81.) Monteon (W)

148B. The City in South America, 1920-Present (4)

Are overgrown urban areas the principal cause of South America's underdevelopment? The course will examine conflicting theories of specific urban crises and compare these theories to the need for a general interpretation of the contemporary crisis of the continent. Specific topics of discussion will include the persistence of pre-modern forms of economic and political urban behavior, the role of the military as an urban institution, the role of intellectuals in rationalizing a cultural crisis, and the social impact of growing slums. (Not offered in 1980-81.) Monteon (W)

149. Egalitarian Revolutionary Movements in Latin America, 1850-Present (4)

The course discusses the social origins, personalities, and ideologies of the major Latin American revolutionary movements in the modern era. Emphasis will be placed on the use of violent upheaval as a means of substantial social change. Monteon (W)

150. Anglo-American Rural Life: 1450-1750 (4)

This course will deal with the changing structure of English rural life as it responded to the growth of capitalism and to the problems of the New World. Ritchie (W)

151Q. Nineteenth-Century United States History (4)

See *Colloquia* below.

152. History of the Far West (4)

The trans-Mississippi West, emphasizing the Pacific Slope and the time since the migrations of the 1840s. Pomeroy (W)

152Q. Social and Ethnic History (4)

See *Colloquia* below.

153Q. American Federalism (4)

See *Colloquia* below.

154. Twentieth-Century American Legal and Constitutional History (4)

A lecture-discussion course on the development of American legal institutions and ideas from the Reconstruction era to the present, with special emphasis upon the relationships between law and public policy, the transformation of tort and contract liability, the rise of the welfare state, and the problems of judicial review. *Prerequisite:* upper-division standing or consent of instructor. Parrish (W)

155A. Social and Economic History of the Southwest (4)

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. Romo (W)

155B. Social and Economic History of the Southwest (4)

The course will consider the significant trends in Mexican-American history over the past 100 years in the Southwest. Special emphasis will be placed on the primary documents relating to Mexican-Americans in economic and social institutions. Romo (W)

155Q. Mexican-American History (4)

See *Colloquia* below.

156A-B. The Social History of the American City (4-4)

A two-term topical approach to the processes of urbanization in the United States. Among the subjects covered are urban historiography, comparisons between pre-industrial and industrial cities, urban growth, occupational and social mobility, immigration and urban economic, social, and political structures. Dublin, Romo (W)

156Q. American Urban History (4)

See *Colloquia* below.

157. American Legal and Constitutional History to 1890 (4)

This course deals with the development of American law to the 1890s. Attention is given to colonial legal institutions, the theory and origins of federalism in the United States, constitutional law and the Supreme Court, and the interrelationships of law and social-economic change. Lectures, discussion, readings and case-method analysis. *Prerequisite:* upper-division standing or consent of instructor. Scheiber (W)

157Q. American Legal and Constitutional History (4)

See *Colloquia* below.

158A-B. Economic History of the United States (4-4)

A two-quarter course providing analysis of the American economy's development from the colonial period to the present. Readings and lectures will emphasize institutional aspects of economic change, including such topics as federal and state resource-use policies, the nature and impact of southern slavery, business entrepreneurship and management, and agricultural reform movements. Scheiber (W)

158Q. American Economic History (4)

See *Colloquia* below.

159A-B. Afro-American History (4-4)

A lecture-discussion course on the history of Afro-Americans from the colonial period to the present. Tolbert (W)

159Q. Afro-American History (4)

See *Colloquia* below.

160. United States: 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. Ritchie (W)

160Q. Colonial American History (4)

See *Colloquia* below.

161. United States: The American Revolution 1763-1800 (4)

Causes and consequences of the revolution, intellectual and social change, the problems of the new nation, the Constitution, the origins of political parties. Ritchie (W)

161Q. Special Topics: The American Revolution (4)

See *Colloquia* below.

163A-B. History and Social Role of Women in the United States (4-4)

A two-quarter course examining the history of women in the U.S. as members of different ethnic, racial, and socio-economic groups from pre-industrial times to the present. Emphasis is on the interrelationships between women's economic, social, and family roles. (Not offered in 1980-81.) Dublin (W)

163Q. Selected Topics in American Women's History (4)

See *Colloquia* below.

164A-B. American Intellectual History (4-4)

The first quarter covers from colonial times through the pre-Civil War period, European origins, and the development of political, social, economic, and religious thought in the American context. Emphasis on principal thinkers and ideas, with some reference to the general historical background and values. The second quarter deals with the period 1860 to the present. (Not offered in 1980-81.) Tolbert (W)

164Q. American Intellectual History (4)

See *Colloquia* below.

165. History of California (4)

Social, cultural, economic, political developments from the pre-Columbian heritage and early European contacts to the 1980s, emphasizing the years since statehood. Collateral readings; optional papers on special projects; optional plans for concentration in part of collateral reading. *Prerequisite:* upper-division standing or consent of instructor. Pomeroy (W)

166Q. American Society in the Cold War (4)

See *Colloquia* below (W)

167A-B. The United States in the Twentieth Century (4-4)

General historiographical examination through lectures and discussion of political, social, economic, and international trends. Particular emphasis on increasing residential power, political parties, and voting trends, urbanization, the creation of the welfare state, America's role in international politics, and the origins of the cold war, and the historical background of the social unrest of the 1960s. Parrish (W)

167Q. Twentieth-Century American History (4)

See *Colloquia* below.

168Q. America in the 1930s (4)

See *Colloquia* below.

169A-B. History of American Foreign Policy and Diplomacy (4-4)

A two-quarter course in the history of American foreign policy and diplomacy covering the period from the establishment of the colonies to the present. The course deals with the policy of the United States and the forces — intellectual, economic, cultural, and social — which shaped that policy. Rappaport (W)

169C. History of American Foreign Policy and Diplomacy (4)

A continuation of History 169B designed to concentrate on the period of the Cold War. The course will deal with the origins of the Cold War, with its progress in the 1950s, 1960s, and 1970s and the period of detente beginning in the early 1970s which is changing the nature of the struggle and shifting its focus. (Not offered in 1980-81.) Rappaport (W)

169Q. American Diplomatic History (4)

See *Colloquia* below.

170Q. The Second World War (4)

See *Colloquia* below.

171. Post-Revolutionary Soviet Social History 1917-1941 (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. Edelman (E)

171Q. Quantitative Methodology in History (4)

See *Colloquia* below.

172Q. The Philosophy of History (4)See *Colloquia* below.**173Q. Psychosocial History (4)**See *Colloquia* below.**174Q. The Critique of Quantitative History (4)**See *Colloquia* below.**175A. History of Africa to 1880 (4)**

A survey of pre-colonial Africa, concentrating on ancient Africa, the role of Islam in African history, the medieval states 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. (NW)

175B. Modern Africa (4)

A survey of African history dealing with the European scramble for territory, primary resistance movements, the rise of nationalism and the response of metropolitan powers, the transfer of power, self-rule and military coups, the quest for identity and unity. Reynolds. (NW)

175Q. Marxist Method and Historical Analysis (4)See *Colloquia* below.**176. History of South Africa (4)**

The origins and the interaction between the peoples of South Africa. Special attention will be devoted to industrial development, urbanization, African and Afrikaner nationalism and the origin and development of apartheid and its consequences. (Not offered in 1980-81.) Reynolds. (NW)

177. African Society and the Slave Trade: Topics (4)

Topics: African society on the eve of the slave trade, trans-Saharan trade, slavery within African societies, Atlantic slave trade, problems of numbers exported and profitability, impact of slave trade on African society, and the abolition of the slave trade. (Not offered in 1980-81.) Reynolds. (NW)

177Q. Economic History of Africa (4)See *Colloquia* below.**178. Economic History of Africa (4)**

Lecture-discussion course on the economic development of sub-Saharan Africa from earliest times to the present. Topics will include: pre-European trade, the Atlantic slave trade, the era of legitimate trade, economic imperialism and the colonial economy, and post-independence economic development. Reynolds. (NW)

178Q. Special Topics in African History (4)See *Colloquia* below.**179. Colonial Rule and African Resistance (4)**

A lecture-discussion course on African resistance to colonial forces. The strength, scale, organization, and effectiveness of African resistance and European pacification will be emphasized. (Not offered in 1980-81.) Reynolds. (NW)

181A. 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. Metzger. (NW)

181B. The 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 Tang and Sung times, and the beginnings of Neo-Confucianism. Metzger. (NW)

181C. 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:* 181A or 181B, or consent of the instructor. Metzger. (NW)

182. 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. (Not offered in 1980-81.) Pickowicz. (NW)

183. 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. (NW)

184. 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. (NW)

186Q. Self and Society in Modern Chinese Thought (4)See *Colloquia* below.**188. Peasant Revolution: Modern China (4)**

This course focuses exclusively on the role of the peasant in the modern Chinese revolution. It examines the social and economic status of the peasant in Confucian society, traditional peasant rebel ideologies, the peasant in Marxist theory, Chinese communist mobilization of the peasantry, and the peasant during the transition to socialism. This is a lecture-discussion course which places considerable emphasis on student participation. (Not offered in 1980-81.) Pickowicz. (NW)

189Q. Special Topics in Modern Chinese History (4)See *Colloquia* below.**190Q. Literature of Third World History (4)**See *Colloquia* below. (NW)**196A. History Honors (4)**

A program of independent study providing candidates for history honors with 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. *Prerequisite:* consent of instructor. Staff.

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. *Prerequisite:* consent of instructor. Staff.

196Q. Colloquium in History (4)See *Colloquia* below.**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 on 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.

198. Directed Group Study (4)

Directed group study on a topic not generally included in the regular curriculum. By special arrangement with a faculty member. (P/NP grades only.) *Prerequisite:* consent of instructor. Staff.

199. Independent Study for Undergraduates (4)

Program to be arranged between student and instructor. (P/NP grades only.) *Prerequisites:* upper division standing and consent of instructor. Staff.

Colloquia

Colloquia are courses devoted to extensive study of special topics. These courses are limited to twenty or fewer students and are generally organized as seminars or discussion classes. *The prerequisite for colloquia is upper division or graduate standing and consent of instructor.*

101Q. Special Topics in Greek History (4)

Detailed study of selected problems or periods in the history of Greece. Topics vary from year to year, and students may therefore repeat the course for credit. (Not offered in 1980-81.) Mosshammer. (E)

102Q. Special Topics in Roman History (4)

Detailed study of selected problems or periods in the history of Rome and the Roman empire. Topics vary from year to year, and students may therefore repeat the course for credit. Mosshammer. (E)

104Q. 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. Chodorow. (E)

105Q. Special Topics in the History of Early Modern Europe (4)

Topics will vary from year to year, and students may therefore repeat the course for credit with the permission of the instructor. (Not offered in 1980-81.) Marino. (E)

109Q. Special Topics in Twentieth-Century European Social Thought (4)

A study of twentieth-century European intellectuals and their social, political, historical, and cultural theories. Topics change from year to year. (Not offered in 1980-81.) Luft. (E)

110Q. Lenin and the Russian Revolution (4)

Topics will vary from year to year. May be repeated for credit. This year's topic: Jews and Anti-Semitism in Russia and the Soviet Union. *Prerequisite:* consent of instructor. Edelman. (E)

112Q. 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 findings to the seminar. Ringrose. (E)

115Q. Lord and Peasant in East Europe (4)

The transition from feudalism to capitalism in rural Prussia, Poland, and Russia. Edelman. (E)

116Q. Special Topics in the Social History of Early Modern Europe (4)

Topic varies from year to year. May be repeated for credit. (Not offered in 1980-81.) Norberg. (E)

117Q. The Atlantic World in the Revolutionary Age (4)

Examination of the growth of Atlantic commerce in the eighteenth century, with particular focus on commercial development and the beginnings of the Industrial Revolution. Ringrose. (W)

118Q. German Thought in the Romantic Era: 1780-1830 (4)

Luft. (E)

119Q. Special Topics in Twentieth-Century Intellectual History (4)

Topics will vary from year to year. Luft. (E)

120Q. Nineteenth-Century Europe (4)

This course alternates with History 121Q. Topics will vary from year to year. May be repeated for credit. (Not offered in 1980-81.) Mitchell. (E)

121Q. Twentieth-Century Europe (4)

This course alternates with History 120Q. Topics will vary from year to year. May be repeated for credit. (Not offered in 1980-81.) Mitchell. (E)

122Q. Ideology and the Imagination in Modern Britain (4)

Culture and society as reflected in novels and essays. J. Hughes. (E)

126Q-127Q. Ideology and the Imagination in France, 1850-1950 (4-4)

A century of social and cultural change as mirrored in the writings of representative essayists, memoirists, novelists, and social critics and theorists. An IP grade will be given at the end of the first quarter. The final grade will not be given until the end of the second quarter. 126Q is a prerequisite for 127Q. H. S. Hughes. (E)

130Q. Special Topics: Expansion of Europe (4)

Topics will vary from year to year. (Not offered in 1980-81.) Ringrose, Ritchie. (E)

131Q. The Historical Novel (4)

Works of Stendahl, Tolstoy, 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. Jackson. (E)

grade will not be given until the end of the second quarter. *Prerequisite: fluent reading knowledge of Spanish required. German or French desirable.* (Not offered in 1980-81.)

240A-B-C. The Literature of Latin American History (4-4-4)

A three-quarter sequence of readings and discussions on the historiography, bibliography and sources for Latin American history, from the colonial period to the present. Presented as three separate courses: A, fifteenth to eighteenth centuries; B, 1750 to 1910; C, post-1910. Required of all beginning Ph.D. graduate students in Latin American history. Reading knowledge of Spanish or Portuguese helpful, but not required.

242A-B. Research in the History of Latin America (4-4)

Examination through literary and historical texts of major themes and topics such as the role of labor, culture and revolution, peasant movements, nationalism and literary images of social change. Topic will vary from year to year. An IP (in progress) 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: reading ability in Spanish or Portuguese.*

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 (in progress) grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. *Prerequisite: 246A.* (Not offered in 1980-81.)

248. Interdisciplinary Seminar on Latin America (4)

Seminar on Latin America for graduate students in the humanities and social sciences which will discuss history and modern society — both the impact of the nineteenth and early twentieth century in shaping present Latin America and Latin Americans' perception of that past. Basic materials will be drawn from economic and social history, anthropology, and literature. A complementary seminar will be taught in sociology following 248. (Not offered in 1980-81.)

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.

251. Readings in American History (4)

Readings and discussion in selected areas of American history for advanced graduate students. (Not offered in 1980-81.)

258A-B. American Economic History (4-4)

Examination of some of the major interpretive problems in American economic history, and case studies of public economic policies and their impact. The first quarter will be devoted to readings and discussions, and the second quarter to the writing of individual research papers. An IP (in progress) grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. (Not offered in 1980-81.)

261A-B. United States, Colonial Period (4-4)

(Not offered in 1980-81.)

266A-B. United States History, 1789-1877 (4-4)

Analysis of sources and methods of historical research in the National Period to 1877. Readings and original research papers will be required.

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 (in progress) grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. (Not offered in 1980-81.)

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 (in progress) grade will be awarded at the end of the first quarter. Final grade will not be given until the end of the second quarter. (Not offered in 1980-81.)

277A-B. Seminar in 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 to the writing of individual research papers. (Not offered in 1980-81.)

298. Directed Reading (1-12)

Guided and supervised reading in the literature of the several fields of history. (S/U grades permitted.)

299. Thesis Direction (1-12)

Independent work by graduate students engaged in research and writing of doctoral theses. (S/U grades only.)

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. (S/U grades only.)

501. Teaching in the 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.)

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.)

HUMANITIES

Office: 1512 Humanities Library
Building, Revelle College

* * *

These sequences of courses may be used by Revelle College students in fulfilling the humanities requirement of the college. Interested students from other colleges may register for these courses if space is available. They are offered jointly by the Departments of Literature, Philosophy, and History 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.

One purpose of the program is to develop the student's ability to write clear and well-ordered expository prose. Humanities 10A-B-C, 11A-B-C and 12A-B-C are designed to meet this objective, and one of these sequences must be completed by all freshmen in Revelle College. In these courses, students meet twice weekly in sections organized on a laboratory basis and designed to provide instruction specifically devoted to writing. Frequent written exercises are required. Completing these sequences satisfies the Subject A requirement for students who have not otherwise satisfied it. Additional special attention is given to those students who enter Revelle College with a Subject A deficiency.

In the sophomore year, regular written exercises are required in conjunction with students' work in discussion sections.

For detailed description of the Revelle College Humanities requirement see "Revelle College, General Education Requirements, Humanities."

A student may not graduate from Revelle College with a major in humanities. Students interested in the area of humanities must choose a specific major within the humanities, i.e., literature, philosophy, etc.

Courses

10A-B-C. Major Themes in Humanities (6-6-6)

This sequence examines central issues and themes in the Western conception of humanities from biblical times onward, combined with training and practice in writing skills. Intensive practice in writing expository prose. Topics will vary from year to year. Three hours of lecture, two hours of writing laboratory. (F,W,S)

11A-B-C. The Early Western Tradition (6-6-6)

(Not open to students who have completed Humanities 2-3-4* or 21A-B-C.)

Readings in the history, literature, and philosophy of the Western world from biblical times through the Renaissance, combined with training and practice in writing skills. Intensive practice in writing expository prose. Three hours of lecture, two hours of writing laboratory. (F,W,S)

12A-B-C. The Western Tradition from the Renaissance to the Present (6-6-6)

(Not open to students who have completed Humanities 5-6-7* or 22A-B-C.)

Readings in the history, literature, and philosophy of the Western world from the Reformation period to modern times, combined with training and practice in writing skills. Intensive practice in writing expository prose. Three hours of lecture, two hours of writing laboratory. (F,W,S)

*Humanities 2-3-4 and 5-6-7 were not offered after 1975-76

20A-B-C. Major Themes in Humanities (6-6-6)

Coverage corresponds to 10A-B-C. (Not open to students who have completed 10A-B-C. Department approval required for students who have completed 11A-B-C or 12A-B-C.)

Examination of central issues and themes in Western conception of humanities from biblical times onward. Topics will vary from year to year. Three hours of lecture. *This sequence satisfies a Revelle sophomore requirement, but is also open to and offered for students from other colleges.*

Prerequisite: Satisfactory completion of one of the college writing programs. (F,W,S)

21A-B-C. The Early Western Tradition (4-4-4)

Chronological coverage corresponds to 11A-B-C. (Not open to students who have completed 11A-B-C.)

Readings in the history, literature, and philosophy of the Western world from biblical times through the Renaissance. Three hours of lecture. *This sequence satisfies a Revelle sophomore requirement, but is also open to and offered for students from other colleges.*

Prerequisite: Satisfactory completion of one of the college writing programs. (F,W,S)

22A-B-C. The Western Tradition from the Reformation to the Present (4-4-4)

Chronological coverage corresponds to 12A-B-C. (Not open to students who have completed 12A-B-C.)

Readings in the history, literature and philosophy of the Western world from the Reformation period to modern times. *This sequence satisfies a Revelle sophomore requirement, but is also open to and offered for students from other colleges.*

Prerequisite: Satisfactory completion of one of the college writing programs. (F,W,S)

ITALIAN LITERATURE

See Literature

JUDAIC STUDIES

OFFICE: 4072 Humanities and Social Science Building, Muir College.

The Judaic Studies Program is an interdisciplinary program offering courses and course sequences which enable interested students to gain insights into the principal aspects of Jewish culture, including history, philosophy, religion, literature, and language. Several of the courses offered emphasize the relationship of Judaism to other cultures.

Students whose principal interest is in Judaic studies have the following options:

- I. Within the Classical Studies Program, students may pursue a major concentrating upon Hebrew/Biblical courses offered in the Departments of Literature, History, and Philosophy.
- II. 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.
- III. Special project majors in Revelle and Muir Colleges allow for a major in Judaic Studies.

In addition, Revelle and Muir Colleges have non-contiguous minors in Judaic studies; Warren College has Judaic studies 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.

UC San Diego 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)

Cultural Traditions 100. Ethical and Social Theories in the Judaic Tradition (4)

Anthropology 169. Israeli Society (4)

History 100. Ancient Near East and Israel (4)

History 110Q. Jews and Anti-Semites in Russia (4)

History 127. Colloquium in Twentieth-Century European History (European Jewry 1880-1960) (4)

Lit/He 1. Beginning Hebrew (4)

Lit/He 2-3. Intermediate Hebrew (4)

Lit/He 51. Introduction to Readings and Interpretations (4)

Lit/He 52. Readings and Interpretations (4-4-4)

Lit/He 100. Introduction to Hebrew Literature (4)

Lit/He 101. The Development of Hebrew Literature (4)

Lit/He 102. Hebrew Literature: Biblical and Modern (4)

Lit/Gen 104. The Bible and Western Literature (4)

Lit/Gen 108. The Jewish Experience in Literature (4)

Lit/Gen 109. Jewish Mysticism (4)

Lit/He (Lit/Gen) 110. Hebrew Prophetic Literature (4)

Lit/He (Lit/Gen) 111. Bible: The Narrative Books (4)

Lit/He (Lit/Gen) 112. Bible: The Poetic Books (4)

Lit/He (Lit/Gen) 113. Medieval Hebrew Literature (4)

Lit/He (Lit/Gen) 114. Hebrew Literature: The Modern Period (4)

Lit/He (Lit/Gen) 115. Topics in the Prophets (4)

Lit/He (Lit/Gen) 116. Topics in Biblical Narrative (4)

Lit/He (Lit/Gen) 117. Topics in Biblical Poetry (4)

Lit/He (Lit/Gen) 118. Interpreting the Bible in the Twentieth Century (4)

Lit/Gen 119. Mythology (4)

Lit/Gen 157. Yiddish Literature in Translation (4)

Lit/He 190. Seminars (4)

Courses crosslisted 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 198. Directed Group Study (4)

Lit/He 199. Special Studies (4)

Lit/Cl 210. Classical Studies (4)

Lit/He 297. Directed Studies (4)

Lit/He 298. Special Projects (4)

Philosophy 160A-B. Philosophy of Religion (4-4)

Political Science 145. The Middle East in World Affairs (4)

LANGUAGE

OFFICE: Language Center, 2125 Psychology and Linguistics Building, Muir College.

Courses numbered Language 1-2-3-4-5-6 consist of a combination of small

tutorial meetings with a native speaker, weekly group conferences led by a linguist, assigned laboratory work, and outside reading.

Students who begin their study of a language at UC San Diego should enroll in Language 1. Students who have studied a language previously should consult the following chart to determine in which course to enroll.

Course	Previous Study
Language 1	none or junior high only or 1 year high school
Language 2	*2 years in high school; or 1 semester in college
Language 3	new students are not enrolled in Language 3
Language 4, 5, 6	3-4 years in high school; or 2-3 semesters in college
Literature 10	Language 4, 5, and 6 or Basic Language Program proficiency
Literature 25	Literature 10
Literature 15, 24	Literature 10 (native speakers)
Literature 50	Literature 10 or Basic Language Program proficiency

*Students with two years in high school (or one semester in college) cannot enroll in Language 1 courses in the fall quarter. Any exceptions require permission of the instructor; students not having special permission will be automatically dropped from the course. All students with two years of high school (or one semester of college) language will enroll in Language 2 in the winter quarter. However, exceptional language students with two years of high school (or one year of college) language may enroll in the fall quarter in Language 4.

Courses numbered 1-2-3-4-5-6 may not be taken for Pass/Not Pass.

Classes may not be added beyond the first week of instruction.

Mini and Maxi Programs for Language Study

1. Mini Program

The Mini Program (Language 1, 2, 3 [with a grade of A] and Literature 10; Language 1, 2, 3, 4 [with a grade of A or B] and Literature 10) would provide students with basic competence in all four language skills — speaking, understanding, reading, and writing. It is to be recommended for students who do not plan to use the language academically, but want to learn it for purposes of travel, reading, and cultural enrichment.

2. Maxi Program

The Maxi Program (Language 1, 2, 3 [with a grade of A] and Literature 10, 25, 50*; Language 1, 2, 3, 4 [with a grade of A or B] and Literature 10, 25) is a two-year sequence which extends the platform provided by the mini model. It is intended to make the student sufficiently competent in the language so that it can be used in an academic major. This sequence is recommended for all students who wish to use the language in their future academic or professional careers.

We strongly urge the completion of the Maxi Program be a prerequisite for all Education Abroad Program students who have not had the language previously.

With departmental approval students enrolled in Language 4, 5, or 6 may also enroll in Literature 10 courses.

*In German, an alternate would be Literature 10, 15, 25.

Courses numbered Language 11 are self-instructional and are intended for students whose concern is to learn only to read a language, and for graduate students preparing to fulfill French or German reading requirements.

The language laboratory and language library at UC San Diego offer 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 materials, credit will be granted to undergraduate students who wish to study language on a self-instructional basis. Such students should enroll in Language 19. On the first day of the quarter students enrolled in Language 19 must meet with the supervisor of Language 19, who will establish a program of study and arrange for a mid-term and a final examination. Subject to the availability of materials at a suitable level of advancement, Language 19 may be taken for full or half credit and may sometimes be repeated for credit.

The facilities and materials in the language laboratory and language library are available to all students and faculty of the university, whether or not they are formally enrolled in one of the language programs.

Courses

CHINESE

Lang/Ch 61. Elementary Chinese (4)

Basic grammar and usage with initial emphasis on the spoken language. The written language will be progressively incorporated.

Lang/Ch 62. Elementary Chinese (4)

Continuation of Lang/Ch 61. *Prerequisite: Lang/Ch 61 or equivalent.*

Lang/Ch 63. Elementary Chinese (4)

Continuation of Lang/Ch 62. *Prerequisite: Lang/Ch 62 or equivalent.*

Lang/Ch 64. Intermediate Chinese (4)

Grammar, conversation, reading, and writing in Chinese. Continuation of Lang/Ch 63. *Prerequisite: Lang/Ch 63 or equivalent.*

Lang/Ch 65. Intermediate Chinese (4)

Continuation of work begun in Lang/Ch 64. Intermediate Chinese. *Prerequisite: Lang/Ch 64 or equivalent.*

Lang/Ch 66. Intermediate Chinese (4)

Continuation of work in Lang/Ch 64. Intermediate Chinese. *Prerequisite: Lang/Ch 65 or equivalent.*

Lang/Ch 167. Advanced Chinese (4)

Advanced conversation, reading, and writing in Chinese. Continuation of Lang/Ch 66. *Prerequisite: Lang/Ch 66 or equivalent.*

Lang/Ch 168. Advanced Chinese (4)

Advanced conversation, reading, and writing in Chinese. Continuation of Lang/Ch 167. *Prerequisite: Lang/Ch 167 or equivalent.*

Lang/Ch 169. Advanced Chinese (4)

Advanced conversation, reading, and writing in Chinese. Continuation of Lang/Ch 169. *Prerequisite: Lang/Ch 168 or equivalent.*

See also

Chinese Studies/175. Readings in Contemporary Chinese I (4)

Chinese Studies/176. Readings in Contemporary Chinese II (4)

Chinese Studies/181A. Introduction to Classical Chinese (4)

Chinese Studies/181B. Introduction to Classical Chinese (4)

ESPERANTO

Lang/Es 16. Elementary Esperanto (4)

An introduction to the construction of Esperanto, its origins and its literature and general problems of man-made language projects. Students should be able to speak, write, read, and understand Esperanto by the end of the quarter. (Esperanto may not be submitted to fulfill UC San Diego language requirements.)

Lang/Es 26. Intermediate Esperanto (4)

Conversation, play reading, use of instructional tapes. History of international language projects, birth and development of Esperanto, current uses, etc. *Prerequisite: Lang/Es 16 or equivalent.*

Lang/Es 36. Advanced Esperanto (4)

Discussion of literary works and poetry, both translations and original belles lettres. Translations into Esperanto of documents of significance in U.S. and world history. Preparation for active personal participation in annual international Esperanto congresses. *Prerequisite: Lang/Es 26 or equivalent.*

FRENCH

Lang/Fr 1-2-3-4-5-6. French (4-4-4-4-4-4)

See general description above.

Lang/Fr 11. Elementary French Reading (2-4)

A course designed to prepare graduate students to meet reading requirements in French. After a one-week introduction to French orthography/sound correspondences, students work with a self-instructional textbook. Mid-term and final examinations. (F,W,S)

See also

Department of Literature

Lit/Fr 10. Readings and Interpretations (4)

Lit/Fr 25. Composition and Conversation (4)

Lit/Fr 50. Readings in French Literature and Culture (4)

GERMAN

Lang/Ge 1-2-3-4-5-6. German (4-4-4-4-4-4)

See general description above.

Lang/Ge 11. Elementary German Reading (2-4)

A course 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 10. Readings and Interpretations (4)

Lit/Ge 25. Composition and Conversation (4)

GREEK

See

Department of Literature

Lit/Gk 1. Beginning Greek (4)

Lit/Gk 2. Intermediate Greek (4)

HEBREW

See

Department of Literature

Lit/He 1-2-3. Hebrew (4-4-4)

Lit/He 51. Introduction to Reading and Interpretations (4)

Lit/He 52. Readings and Interpretations (4)

ITALIAN

See

Department of Literature

Lit/It 1. Beginning Italian (4)

Lit/It 2. Intermediate Italian (4)

LATIN

See

Department of Literature

Lit/La 1. Beginning Latin (4)

Lit/La 2. Intermediate Latin (4)

RUSSIAN

Lang/Ru 1-2-3-4-5-6. Russian (4-4-4-4-4-4)

See general description above.

See also

Department of Literature

Lit/Ru 25. Readings and Interpretations (4)

Lit/Ru 50. Readings in Russian Literature and Culture (4)

SPANISH

Lang/Sp 1-2-3-4-5-6. Spanish (4-4-4-4-4-4)

See general description above.

See also

Department of Literature

Lit/Sp 9. Readings and Interpretations: Spanish for Native Speakers (4)

Lit/Sp 10. Readings and Interpretations (4)

Lit/Sp 25. Composition and Conversation (4)

Lit/Sp 50. Readings in Spanish Literature and Culture (4)

DIRECTED STUDY

Lang/19. Directed Study — Language (2-4)

Self-instructional materials are available at present in: Afrikaans, Albanian, American Sign Language, Arabic (Iraqi), Arabic (eastern), Arabic (Egyptian), Arabic (Moroccan), Basque, Bengali, Bulgarian, Burmese, Chinese (Cantonese), Chinese (Mandarin), Chinese (Amoy), Czech, Danish, Dutch, Eflak, English as a Foreign Language, Esperanto, Finnish, French, German, Modern Greek, Haitian Creole, Hausa, Hawaiian, Modern Hebrew, Hindi, Hungarian, Igbo, Icelandic, Italian, Japanese, Korean, Latin, Luganda, Malay, Maori, Navajo, Nepali, Nigerian Pidgin, Norwegian, Persian, Polish, Portuguese, Russian, Serbo-Croatian, Spanish, Swahili, Swedish, Tagalog, Tibetan, Thai, Turkish, Twi, Vietnamese, Yiddish, Yoruba.

LINGUISTICS

OFFICE: 5237 Psychology and
Linguistics Building, Muir College

Professors:

Edward S. Klima, Ph.D.
S.Y. Kuroda, Ph.D.
Ronald W. Langacker, Ph.D.
Margaret Langdon, Ph.D.
Leonard Newmark, Ph.D. (Chairman)
David M. Perlmutter, Ph.D.
Sanford A. Schane, Ph.D.

Associate Professor:

Matthew Y. Chen, Ph.D.

Assistant Professors:

Sandra L. Chung, Ph.D.
Jeffrey L. Elman, 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 supervises the teaching of the foreign languages offered in the Basic Language Program as well as Language 19. See "Language.")

The Major Program

An undergraduate major in linguistics is intended to give students the background that will best prepare them for graduate work in this field. Because linguistics shares its object matter — language — with so many other disciplines, this major is unlike many others in that it does not require that all courses be taken in the major department itself. The major

in linguistics will consist of twelve upper-division courses: eight courses in the Department of Linguistics, complemented by four other courses in linguistics or from other departments, directly related to the study of language. (Of the twelve courses, a minimum of six linguistics courses must be taken in residence.) Linguistics 10 is a prerequisite for all upper-division courses.

Linguistics 101A, 101B, 102A, and 102B are required of all majors and will count as part of the minimum eight courses within linguistics proper.

For all courses counted toward the major in linguistics, the student must receive grades of C or better. Courses counted toward the major may not be taken on a Pass/Not Pass basis, except Linguistics 198 or 199.

All linguistics majors must satisfy two language requirements. These requirements are above and beyond any language requirements which might be imposed by any of the individual colleges.

LANGUAGE REQUIREMENT I:

The student must achieve proficiency in French, German, Spanish, or Russian. Proficiency is established by passing a reading proficiency examination as well as passing an oral interview administered by the UC San Diego Basic Language Program.

LANGUAGE REQUIREMENT II:

The student must achieve competence in at least one additional foreign language. Competence is defined as successful completion (with grades of C or better) of three one-quarter courses or the equivalent in a second language, or by passing a reading test administered by the Basic Language Program. The second language need not be one of the four listed in Language Requirement I.

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. (Linguistics 198 or 199 will not

qualify as one of the minimum eight courses in linguistics proper, but may satisfy one of the four additional courses.)

The Revelle College Major Program

1. Language Requirements I and II.
2. Eight upper-division courses in linguistics.
3. Four additional upper-division courses related to the study of language. These four courses may be taken in departments other than linguistics: for instance, the Departments of Mathematics, Electrical Engineering and Computer Sciences, Philosophy, Psychology, Anthropology, Sociology, Communications, or Literature. These courses need not be taken in the same department but they must form a coherent program of study in conjunction with the required core of linguistics courses. The courses to complete the major are selected in consultation with the departmental undergraduate adviser. Because of the great flexibility of the linguistics major, the classification of this 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 non-contiguous minor.

The Revelle College Minor Program

The linguistics minor consists of six courses, Linguistics 10, 101A, 102A, and one additional upper-division course in linguistics. The two 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, Electrical Engineering and Computer Sciences, Philosophy, Psychology, Anthropology, Sociology, Communications, or Literature. These courses need not all be taken in the same department, but they 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.

The Muir College Major Program

1. Language Requirements I and II.
2. Eight upper-division courses in linguistics.

3. Four additional upper-division courses from linguistics and/or from other departments but relevant to the study of language.
4. Majors must take at least one course relevant to the study of language, not necessarily upper-division, from each of three areas: formal, social science, and humanities; for instance, the Departments of Mathematics, Electrical Engineering and Computer Sciences, and Philosophy (formal); the Departments of Anthropology, Communications, Psychology, and Sociology (social sciences); the Departments of History and Literature (humanities). These courses should be selected in consultation with the linguistics adviser. Upper-division courses may simultaneously satisfy 3 and 4.

The Muir College Minor Program

The linguistics minor consists of six courses: Linguistics 10, 101A, 101B, 102A, and 102B, plus one additional upper-division course in linguistics.

The Third College Major Program

1. Language Requirements I and II.
2. Eight upper-division courses in linguistics.
3. Four additional upper-division courses from linguistics and/or from other departments but relevant to the study of language.
4. Majors must take at least one course relevant to the study of language, not necessarily upper-division, from each of three areas: formal, social science, and humanities; for instance, the Departments of Mathematics, Electrical Engineering and Computer Sciences, and Philosophy (formal); the Departments of Anthropology, Communications, Psychology, and Sociology (social sciences); the Departments of History and Literature (humanities). These courses should be selected in consultation with the linguistics adviser. Upper-division courses may simultaneously satisfy 3 and 4.

The Third College Minor Program

The linguistics minor consists of six courses: Linguistics 10, 101A, 101B, 102A, and 102B, plus one additional upper-division course in linguistics.

The Warren College Major Program

1. Language requirements I and II.
2. Eight upper-division courses in linguistics.

3. Four additional upper-division courses related to the study of language. These four courses may be taken in departments other than linguistics: for instance, the Departments of Mathematics, Electrical Engineering and Computer Sciences, Philosophy, Psychology, Anthropology, Sociology, or Literature. These four courses may not overlap with the student's outside area of concentration and should be approved in advance by the linguistics adviser.

The Warren College Minor Program

The linguistics minor consists of six courses: Linguistics 10, 101A, 101B, 102A, and 102B, plus one additional upper-division course in linguistics.

The Graduate 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 Albanian, American Indian, Austronesian, Chinese, Japanese, and Romance. This emphasis is complemented by unusually strong offerings and research interests in such related fields as comparative-historical linguistics, American Sign Language, language acquisition and pedagogy, orthography, poetics, experimental phonetics, neurolinguistics, formal linguistics, anthropological linguistics, sociolinguistics, and psycholinguistics (in conjunction with the Department of Psychology). 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 a PDP-11/34 computer, and the department also has ready access to the Burroughs 6700 campus computer. In addition to the extensive linguistics holdings in the main library, the department maintains a reading room with a good collection of reference books, journals, 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. Since the Department of

Linguistics directs foreign language instruction for the campus through its Basic Language Program, many opportunities are provided for 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 Acquisition facilitates research over a broad range of projects concerned with theoretical and applied problems. Finally, UC San Diego is ideally located from the standpoint of availability of native speakers of a wide variety of languages.

Program of Study

The graduate program is aimed essentially towards the Ph.D. in Linguistics, with provision for granting the M.A. in Linguistics or in Linguistics with Specialization in Teaching English to Speakers of Other Languages upon completion of certain graduate requirements. The C. Phil. is also available to students preparing for the Ph.D. upon completion of all degree requirements other than the dissertation and the teaching requirement.

In the first two years of graduate study, the student's basic courses will stress linguistic theory, the structure of English, and linguistic analysis. For advanced work, students will 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. All applicants are expected to have substantial experience with foreign languages. Students may begin their graduate program here with no previous course work in linguistics proper. However, such students 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 linguistics preparation or languages will be advised by the department on how to make up the deficiency. In some cases, summer course work may be required prior to be-

ginning the graduate program. Because the basic graduate courses offered by the Department of Linguistics are three-quarter sequences, new graduate students will be admitted only in the fall of any academic year.

Language Requirements

A candidate for the M.A. degree must demonstrate: (1) A reading knowledge of *one* language, to be chosen from: French, German, Russian, and Spanish. If Spanish is chosen, the student must also demonstrate conversational ability in Spanish. A student whose native language is not English may use English to satisfy this requirement. (2) Knowledge of the structure of a non-Indo-European language, by submitting a descriptive paper acceptable to the department's graduate committee.

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. If Spanish is chosen, the student must also demonstrate conversational ability in 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. (3) Knowledge of the structure of a non-Indo-European language, by submitting a descriptive paper acceptable to the department's graduate committee.

Departmental Examinations

Candidates for both the M.A. and Ph.D. degrees must pass the departmental comprehensive examination. This examination gauges the student's general familiarity with theory and methodology. Normally, a student takes the examination after three quarters of graduate study.

Candidates for the Ph.D. degree must also pass the qualifying examination, an oral examination which tests the student's knowledge in the area of specialization. The qualifying examination — which normally requires from six to nine quarters of course preparation at the graduate level — may be taken only after the student has passed the departmental comprehensive examination and satisfactorily completed all language requirements, and satisfactorily completed all course work.

Apprentice Teaching

As part of their preparation for a future academic career, linguistics students at UC San Diego are given special opportunities to participate in teaching programs under the supervision of a professor. Depending on qualifications, students may conduct conversation classes or analysis conferences in the Basic Language Program or in the Program in American Language and Culture, both of which are administered by the department; may teach in one of the college writing programs; or may assist a professor in the teaching of a graduate or undergraduate linguistics course. Such apprentice training, for three quarters, is an integral part of the linguistics graduate program at UC San Diego and as such constitutes one of the requirements for the Ph.D.

Dissertation

The candidate for the Ph.D. will write a substantial dissertation incorporating the results of original and independent research carried on 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 and after having the final typed version of the dissertation accepted by the Central University Library.

Courses

Lower Division

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 subdisciplines.

Upper Division

All upper-division courses have as their prerequisite Linguistics 10 and Language Requirement I. Exceptions require the approval of the adviser or consent of the instructor.

101A. Elementary Syntax (4)

Examination of the syntactic structures of natural languages, with special reference to the structure of English. Exercises in syntactic description. The empirical justification of syntactic analyses. Syntactic theory and universals.

101B. Intermediate Syntax (4)

Examination of the syntactic structures of natural languages, with special reference to the structure of English. Exercises in syntactic description. The empirical justification of syntactic analyses. Syntactic theory and universals. *Prerequisite: Ling. 101A.*

102A. Elementary Phonology (4)

Elementary anatomy and physiology of the speech mechanisms. Extensive practice in producing and transcribing the sounds used in a wide variety of the languages of the world. Discussion of phonological-phonetic feature systems.

102B. Intermediate Phonology (4)

Examination of phonological structures of natural languages. Exercises in phonological description. The empirical justification of phonological analyses.

111. Fieldwork (4)

Techniques of linguistic analysis and application of these techniques to fieldwork, either in a sociolinguistic setting or in a simulated field situation by elicitation from native informants. *Prerequisites: Ling. 101 and 102B or consent of instructor.*

125. Introduction to Semantics (4)

A study of meaning in the conceptual framework of contemporary linguistics. The relation between form and content: ambiguity, presupposition, scope of logical operators in natural languages, entailment. Speech acts and their grammatical realizations. Lexical change. Sociological and psychological implications.

131A. Introduction to Mathematical Linguistics (4)

Basic mathematical concepts and methods useful in the study of formal grammars and the formal study of syntax and semantics of natural languages. Elements of set theory, propositional and predicate calculus, abstract algebraic systems.

131B. Introduction to Mathematical Linguistics (4)

Formal conceptualization of such basic linguistic notions as strings, trees, constituent structures, and transformations. Basics of formal grammars and automata and the formal concept of generative system. *Prerequisite: Ling. 131A.*

134. Computational Linguistics (4)

Computer applications to linguistic analysis. Topics to be covered may include: approaches to natural language processing, parsing algorithms, word and string processing, programming in SNOBOL4.

151. Introduction to Historical Linguistics (4)

Language change. Genetic and areal relationships. The comparative method. Internal reconstruction. *Prerequisites: Ling. 102B and Language Requirements I and II.*

152. History of the English Language (4)

General trends in the historical development of the English language, its sounds and its grammar.

157. Classical Languages (4)

Reading and translation of texts as well as linguistic analysis of Sanskrit, Greek, or Latin. *Prerequisite: Ling. 10 or equivalent or consent of instructor.*

161. Romance Linguistics (4)

The history and structure of the Romance languages in the context of generative grammar. A survey of some of the major syntactic, semantic and/or phonological processes in one or more of the Romance languages.

164. Language Structures (4)

Detailed investigation of the structure of one or several languages. *Prerequisites: Ling. 101 and Ling. 102B. Language Requirements I and II.* May be repeated for credit with consent of instructor.

165. Native American Languages (4)

A survey of Native American languages, their genetic relationships and area groupings. Specific languages and families are selected for more detailed discussion, illustrating questions of relevance to linguistic theory and analysis, sociolinguistics, and applied linguistics. *Prerequisites: Ling. 101 and 102B or consent of instructor.*

174. Sociolinguistics (4)

Introduction to the study of the social dimension in linguistics. Topics covered may include: bilingualism, code switching, pidgins, creole language, social factors affecting linguistic change, languages in contact, language in context.

175. Bilingual Education in the U.S. (4)

Bilingual education as currently practiced in the United States. Special concern with two basic questions: (1) assumptions underlying theory of bilingual education, (2) comparison of theory with its realization in specific ethnic communities. Objective is view of bilingual education which takes into account different needs of various ethnic groups.

179. Linguistics and Poetics (4)

Formal poetics, a linguistic approach to various forms of literature. Fundamentals of linguistics will be related to various current theories of literature. Special attention will be given to structuralist analyses of literature including those by Jakobson and the generative grammarians.

181. Psycholinguistics (4)

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology. Basic experimental method as applied to language. *Prerequisite: Ling. 10, or equivalent, or Psych. 110 or 105 or equivalent.*

182. Language and the Brain (4)

The course explores the neuroanatomical and neuropsychological aspects of normal and abnormal language. Topics to be covered include cerebral lateralization of the language functions, aphasia and other disorders, and animal communication as contrasted with human language. *Prerequisites: Ling. 102A-B, Ling. 101 or consent of instructor*

185. Theories and Methods of Foreign Language Acquisition (4)

This course will examine linguistic, psychological, and pedagogical arguments that underlie various language teaching programs. *Prerequisites: Ling. 10 and speaking and reading competence in a foreign language.*

186. Structure of Sign Language (4)

Linguistic and psycholinguistic studies in structure of the American Sign Language of the deaf. Some knowledge of ASL preferable.

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 an undergraduate major adviser in the Department of Linguistics. (P/NP grades only.) *Prerequisite: consent of instructor.* (See description under "Major Program" above.) (May be repeated for credit.)

199. Independent Study in Linguistics (2 or 4)

The student will undertake 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.* (See description under "Major Program" above.) (May be repeated for credit.)

Graduate

NOTE: Unless otherwise specified, the following graduate courses may be taken on a Satisfactory/Unsatisfactory (S/U) basis.

201A. Syntax and Semantics (3)

Introduction to the theory of generative grammar, transformational rules and other rule schemata. Models for syntactic description: formalization of grammars.

201B. Syntactic Theory (3)

The Standard Theory, its notations and formal devices. Generative semantics and interpretive semantics. Comparison of these and of other recent proposals in syntactic theory.

201C. Issues in Syntax (3)

Trends and issues in syntactic theory and analysis. Recent theoretical models and claims. Detailed discussion of selected problems in syntactic and semantic analysis.

202A. Phonetics (3)

Physiology and mechanisms of speech production. Acoustic phonetics. Selected topics in phonetics and phonetic explanation in phonology. Introduction to distinctive features. Practice in production and transcription of the phonetic alphabet.

202B. Phonology (3)

Introduction to phonological theory. Theoretical constructs and formalism. General problems in phonological theory. Phonetic explanations in phonology.

202C. Issues in Phonology (3)

Current issues in phonology. A survey of various phonological theories.

211A-B. Linguistic Analysis (3-3)

Techniques of linguistic analysis (phonetics, phonemics, morphology, syntax). Application of these techniques under simulated field conditions to the recording and analysis of a language by direct elicitation from native informants. May be repeated for credit.

224A. Modern English (3)

A detailed study of the syntax, phonology, and semantics of modern English, with particular emphasis on current research on the general theory of grammars, as developed through the study of English.

225. Topics in Syntactic Theory (3)

Theoretical and descriptive problems in the analysis of the syntactic and semantic structure of English and other languages. May be repeated for credit.

231A-B. Formal Linguistics (3-3)

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.

234. Computational Linguistics (3)

Parsing algorithms for formalized grammars. Approaches to natural-language processing. The computer as a linguist's tool.

235. Topics in Formal Linguistics (3)

Advanced material in special areas of the study of formal grammars to be selected by the instructor. May be repeated for credit. *Prerequisites: Ling. 231A-B or consent of instructor.*

236. Formal Semantics (3)

Introduction to formal semantics and its application to the description of natural language semantics. Semantics of propositional and predicate calculus, elements of modal logic and intensional logic. *Prerequisite: Ling. 231A or consent of instructor.*

240. Philosophy of Language (3)

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.

245. Topics in Phonological Theory (3)

Current theoretical issues in phonological theory. Since the topic can change from year to year, course may be repeated for credit.

247. Topics in Experimental Phonetics (3)

Detailed study of the acoustic structure of speech and of the basic anatomy and physiology of normal speech production. Laboratory techniques in these areas will be covered. Relations between experimental phonetics research and phonological theory will be discussed. May be repeated for credit. *Prerequisite: consent of instructor.*

251. Historical Linguistics (3)

Topics offered on regular basis will include: Indo-European phonology and morphology, the techniques of linguistic reconstruction, theory of language change, advanced problems of historical linguistics.

261. Romance Linguistics (3)

The history and structure of the Romance languages in the context of generative grammar. Topics offered on a regular basis will include: historical French syntax, historical French phonology, modern French syntax, modern French phonology, historical Romance phonology, historical Romance syntax.

262. Albanian Linguistics (3)

Grammatical analysis of Albanian — its phonology, morphology, and syntax.

263. Topics in Chinese Linguistics (3)

Synchronic and diachronic descriptions of Chinese. Survey of some of the following areas: phonology, syntax, dialectology, phonological change, syntactic change, semantic structure, history of Chinese linguistics. Since the topic can change from year to year, course may be repeated for credit.

264. Language Structures (3)

Grammatical analysis of a specific language. Language considered in a given quarter may be Sanskrit, Japanese, Albanian, Diegueño, Hungarian, Old Norse, Tongan, or Uto-Aztecan. May be repeated for credit.

265. Topics in American Indian Linguistics (3)

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.

267. Comparative Grammar (3)

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 in one language, comparing them with analogous phenomena in other languages. Emphasis 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.

268. Topics in Japanese Linguistics (3)

Selected topics from special areas of Japanese syntax and phonology to be selected by the instructor. Since the topic can change from year to year, course may be repeated for credit. *Prerequisite: consent of instructor.*

269. Topics in Polynesian Linguistics (3)

Current problems in comparative Polynesian linguistics, reconstruction of Proto-Polynesian, external relationships of Polynesian. May be repeated for credit.

274. Sociolinguistics (3)

Introduction to the study of the social dimension in linguistics. Topics covered may include: bilingualism, code switching, pidgins, creole language, social factors affecting linguistic change, languages in contact, language in context.

275. Topics in Semantics (3)

Advanced material in special areas of the study of meaning and its relation to formal aspects of human language. Since the topic can be changed from year to year, course may be repeated for credit.

276. Universal Grammar (3)

The problem of constructing an adequate theory of grammar that makes explicit the ways grammars of human languages are alike and the ways they differ. Linguistic universals and the limits on variation they impose. Cross-linguistically viable characterizations of syntactic constructions and syntactic typology. Data is drawn from a variety of languages.

279. Literary Studies and Linguistics (3)

Fundamentals of linguistics. The relationship of literary theories and current linguistic theories. Examination of formalist and structural analyses of literary texts. The contribution of various literary theorists (Jakobson, Ingarden, Spitzer, etc.) to poetics. Structural analysis of selected texts, mostly in English.

280. Topics of Historical Change (3)

Selected topics in syntactic, semantic, and phonological change in one or more languages; discussion of theories accounting for linguistic change. The content of the course will vary from year to year, so the course may be repeated for credit.

281. Psycholinguistics (3)

The study of models of language and of language acquisition from the point of view of modern linguistics and psychology.

282. Language and the Brain (3)

The course explores the neuroanatomical and neuropsychological aspects of normal and abnormal language. Topics to be covered include cerebral lateralization of the language functions, aphasia and other disorders, and animal communication as contrasted with human language. *Prerequisite: consent of instructor.*

285. Topics in Foreign Language Acquisition (3)

Seminar will investigate the theories that underlie the teaching of foreign languages, with particular concentration on contemporary statements claiming a basis in modern psychology and linguistics. May be repeated for credit.

286. Topics in the Language of the Deaf (3)

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.

287. Topics in Orthography (3)

The relationship of orthographic systems to structural linguistics. Since the topic can change from year to year, course may be repeated for credit.

288. Topics in Psycholinguistics (3)

Selected topics in experimental psycholinguistics and applications to language acquisition and pathology. *Prerequisite: consent of instructor.*

290. Issues in Contemporary Linguistics (3)

Discussion of a selected topic drawn from the history of linguistics and/or general linguistics. As subject matter will change, course may be repeated for credit.

291. Topics in History of Linguistics (3)

Salient features in the development of the various aspects of linguistic theory will be surveyed, and the contributions of principal schools, such as the Neogrammarian, Prague, Structuralist traditions, will be assessed. Since the topic can change from year to year, course may be repeated for credit.

Literature

292. Seminar in Language Universals (3)

The methods and concepts of universal grammar. Discussion and evaluation of proposed universals. Original research into universal semantic, syntactic, and phonological tendencies. Since the topic can change from year to year, course may be repeated for credit.

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 (1-6)

Individual research. May be repeated for credit.

298. Fieldwork (1-6)

Linguistic analysis of language in the field. May be repeated for credit.

299. Doctoral Research (1-9)

Directed research on dissertation topic for students who have been admitted to candidacy for the Ph.D. degree. Prerequisite: admission to candidacy.

500. Apprentice Teaching Linguistics (1-4)

The course, designed to meet the needs of graduate students who serve as language assistants and teaching assistants, includes analyses of texts and materials, discussion of teaching techniques and theories, conducting discussion sections, preparation and grading of routine examinations, under the supervision of the instructor assigned to the course. As a requirement for the Ph.D. degree a student must serve as an apprentice teacher for the equivalent of fifty percent time for three academic quarters. Enrollment in this course for a total of twelve units (one to four units per quarter) documents the fulfillment of this requirement. (S/U grades only.)

501. Apprentice Teaching in TESOL (1-4)

The course, designed to meet the needs of graduate students who serve as teaching assistants in the department's TESOL programs, includes analyses of texts and materials, discussion of teaching techniques and theories, conducting the discussion sections, preparation and grading of routine examinations, all under the supervision of the instructor assigned to the course. As a requirement for the M.A. with specialization in TESOL a student must serve as an apprentice teacher for the equivalent of fifty percent time for one academic quarter. This course can also be used to satisfy part or all of the Ph.D. requirement of teaching for three academic quarters. Enrollment in this course for a total of four units documents the fulfillment of this requirement. (S/U grades only.)

LITERATURE

UNDERGRADUATE PROGRAM: 109

Third College Humanities Building,
Third College

GRADUATE PROGRAM: 104 Third
College Humanities Building, Third
College

ADMINISTRATIVE OFFICE: 115 Third
College Humanities Building, Third
College

Professors:

Ronald S. Berman, Ph.D. (*English
Literature*)

*Carlos Blanco Aguinaga, Ph.D.
(*Spanish Literature*)

Joaquin Casaldueiro, Ph.D. (*Spanish
Literature, Emeritus*)

•Diego Catalan, Ph.D. (*Spanish
Literature*)

Charles Cooper, Ph.D. (*Writing,
Director, Third College Writing
Program*)

—Michael deCerteau, Ph.D. (*French
and Comparative Literature*)

Robert C. Elliott, Ph.D. (*English
Literature*)

Margit Frenk, Ph.D. (*Spanish Literature*)

Edwin S. Fussell, Ph.D. (*American
Literature*)

Reinhard Lettau, Ph.D. (*German
Literature*)

James K. Lyon, Ph.D. (*German
Literature*)

Roy Harvey Pearce, Ph.D. (*American
Literature*)

John L. Stewart, Ph.D. (*American
Literature, Provost of John Muir
College*)

•Donald T. Wesling, Ph.D. (*English
Literature*)

Martin W. Wierschin, Ph.D. (*German
Literature and Germanic Philology*)

*Andrew H. 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*)

Alain J. J. Cohen, Ph.D. (*French and
Comparative Literature*)

—•David K. Crowne, Ph.D. (*English and
Comparative Literature*)

Abraham J. Dijkstra, Ph.D. (*American
and Comparative Literature*)

Page Ann duBois, Ph.D. (*Classics*)

Thomas K. Dunseath, Ph.D. (*English
Literature*)

†Susan Kirkpatrick, Ph.D. (*Spanish and
Comparative Literature*)

Fred V. Randel, Ph.D. (*English
Literature*)

†—Rosaura A. Sanchez, Ph.D. (*Spanish
Literature*)

Jonathan Saville, Ph.D. (*Russian and
Comparative Literature*)

Richard L. Terdiman, Ph.D. (*French
Literature*)

Sherley Anne Williams, M.A. (*American
and Afro-American Literature*)

Assistant Professors:

Robert Cancel, Ph.D. (*Comparative
Literature*)

Steven Cassedy, Ph.D. (*Slavic and
Comparative Literature*)

Stephen Cox, Ph.D. (*English Literature,
Director, Revelle Humanities Writing
Program*)

Michael Davidson, Ph.D. (*American
Literature, Director of Archive for New
Poetry*)

William Fitzgerald, Ph.D. (*Classics and
Comparative Literature*)

Richard E. Friedman, Th.D. (*Hebrew
and Comparative Literature*)

Suzanne C. Gearhart, Ph.D. (*French
Literature*)

Catherine Lowe, Ph.D. (*French
Literature*)

—Ronald L. Martinez, Ph.D. (*Italian and
Comparative Literature*)

•Louis Adrian Montrose, Ph.D. (*English
Literature*)

Brooke Neilson, Ph.D. (*Writing, Director,
Warren College Writing Program*)

Mary Jean Pfaelzer, Ph.D. (*English and
American Literature*)

Marta E. Sanchez, Ph.D. (*Latin
American and Chicano Literature*)

Barbara Tomlinson, Ph.D. (*Writing,
Director, Muir College Writing
Program*)

—•Cynthia Walk, Ph.D. (*German
Literature*)

Don Edward Wayne, Ph.D. (*English
Literature*)

Lecturer:

Sam Hinton, A.B. (*General Literature*)

*On leave 1980-81

†On leave fall quarter

—On leave winter quarter

•On leave spring quarter

All literature courses at UC San Diego 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 communications. 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 linguistics and literature as preparation for upper-division course work in a foreign language and literature.

THE MAJOR IN LITERATURE

Six programs are open to those majoring in literature: English-American, French, General Literature, German, Spanish, and Writing. In each case, whatever the primary field of concentration, a student is expected to study a second literature. The range of second literatures includes Chinese, Classical Greek, Hebrew, Italian, Latin, and Russian, as well as the previously mentioned French, German, Spanish, and (for those concentrating in a foreign literature), English-American. Once a student has decided upon a major in literature, he or she is required to plan each quarter's program together with a faculty adviser in the Department of Literature.

A major consists of:

1. The Primary Literature: nine upper-division courses in one literature (except in general literature and writing majors, which are structured differently). See individual program requirements below on the various areas of concentration.
2. The Secondary Literature: three courses in a second literature, given substantially in the native language. At least one of these courses must be upper-division. The other two may be lower-division, provided that they come from the following list: courses numbered 50 through 54 in French, German, Hebrew, Russian, or Spanish; English 21, 22, 23, 24; Latin 1 and 2; Greek 1 and 2; or Italian 1 and 2.
3. A total of at least twelve upper-division Department of Literature courses altogether.

Regularly scheduled departmental courses taken to satisfy the requirements for the literature major must be taken for a

letter grade. No grade below C is acceptable toward any course taken in the major.

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-division courses the minimum requirement is 4,000 words per course.

At least six of the courses credited toward the major must be taken at UC San Diego.

The department also offers the opportunity of interdepartmental majors under the Muir College Special Projects.

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 spring quarter of junior year. If necessary, the GPA standard will be raised so that no more than twenty percent of graduating literature majors will graduate with departmental honors. Students meeting these requirements will be sent, early 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 their honors thesis, which they write in spring quarter, 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.

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. (This requirement will be applied to students graduating in spring, 1981 or later.)
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, in a second literature, given substantially in a language other than English. See the heading, "The Secondary 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

1. Nine upper-division courses in one of the following literatures:
 - a. French
 - b. German
 - c. Spanish
2. Three courses, of which at least one must be upper-division, in a second literature given substantially in the native language. See the heading, "The Secondary 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.

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.

For students declaring a general literature major after June 30, 1980, the requirements will be as follows:

1. Group A: Four upper-division courses in a single national literature (that is, literature originally written in a single language, such as Spanish, or German, or English). 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 organized about a period in literary history or a topic in literary study. Some examples: literature of the ancient world, eighteenth-century literature, the novel, poetry, literature and society in the Third World, 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). In all cases, the student must have his or her plan for Group B approved in advance and in writing by a general literature adviser.
3. Group C: Four more upper-division courses taken from any of the departmental offerings. These courses may, according to the student's preference, be related to the national literature chosen for Group A or the period or topic chosen for Group B, or they may be entirely independent of these.
4. Three courses, of which at least one must be upper-division, in a foreign literature, given in a language other than English. See the heading, "The Secondary Literature," above for detailed information on which lower-division courses may be used toward meeting this requirement. The required upper-division course given in a foreign language, which is used to satisfy the requirement, may — where appropriate — be applied to Group A or Group B.
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 prior to the year 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 literary scholarship and in the teaching of writing will find the major both a context 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. For students declaring a literature writing major after June 30, 1980, the requirements will be as follows:

1. Any of the following literature sequences:
 - a. Lit/Gen 2A-B-C (The Literary Heritage)
 - b. Lit/Gen 4A-B-C (Fiction and Film in Twentieth-Century Societies)
 - c. Lit/Gen 6A-B-C (Understanding Literature)
 - d. Lit/Gen 8A-B-C (Third World Literatures)
 - e. Lit/En 21, 22, and either 23 or 24 (The English and American Literary Imagination)
2. Two courses from any of these three alternatives:
 - a. Any two courses from the sequence Lit/Writing 140-145.
 - b. One course from the sequence Lit/Writing 140-145 and one upper- or lower-division studio course in another art. (Courses like Visual Arts 1, 2, or 3 and Drama 12 are appropriate.) This studio art course must have the approval of the student's adviser in the writing major. The adviser must also sign

for the student an Undergraduate Student Petition form requesting that the particular studio art course be applied toward requirements in the writing major.

- c. One upper- or lower-division studio course in another art and one lower-division writing course.
3. Twelve upper-division courses:
 - a. Six upper-division courses in Lit/Writing from the writing workshop sequences 100-107 and 120-127. These workshops may be repeated for credit, 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 additional Department of Literature courses. Of these six courses, four must be upper-division courses, and three must be given in a language other than English; at least one of these three must be an upper-division course. Especially pertinent to the writing major and applicable toward this requirement are the upper-division writing courses in French, German, and Spanish (Lit/Fr 140, Lit/Ge 140, and Lit/Sp 166), as well as such upper-division language courses as Spanish Language in the United States (Lit/Sp 162). See the heading, "Secondary Literature," above for detailed information on which lower-division courses may be used to meet this foreign language requirement.
 - c. Upper-division electives chosen from the Department of Literature offerings to make a total of twelve upper-division courses. These electives may be literature courses or additional writing courses.

Though all students may be interested in them for various reasons, certain courses are recommended particularly for writing majors with an interest in teaching writing. Some of these courses are grouped under the heading Writing Process, Written Discourse, and Writing Pedagogy, courses numbered 140-145. Another is Lit/Writing 195, Apprentice Teaching in the Muir College Writing Program. Also appropriate are Lit/Sp 164 (Language and Society) and Lit/Sp 163 (Spanish Language in America), which deal with the sociolinguistic aspects of writing.

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. Lower-division courses that are applicable toward the individual minors are listed below. In the case of Chinese, Classical Greek, Hebrew, Italian, and Latin, two of the courses may be tutorials. Students should consult a departmental adviser.

Lower-division courses applicable toward minors (Warren College minors should check individual college requirements):

English/American — Lit/En 21, 22, 23, 24

French — Two quarters of Lit/Fr 50; one quarter of Lit/Fr 25

German — Lit/Ge 15, 25, 51, 52, 53

Greek — Lit/Gk 1, 2

Hebrew — Lit/Heb 3, 51, 52

Italian — Lit/It 1, 2

Latin — Lit/La 1, 2

Russian — Lang/Ru 4, 5, 6 or any higher lower-division Lit/Ru course

Spanish — Two quarters of Lit/Sp 50; one quarter of Lit/Sp 25

General Minor — Any six literature courses. There must be three upper-division courses.

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 upper-division courses chosen from Lit/Writing 100-107 and 120-127. These courses must be in at least two major types of writing. Lit/Writing 140-145 or 195 may constitute two of the courses for the minor.

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 I (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, including the advanced examination in the literature of the student's field.
3. A working knowledge of one foreign 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. No 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 receive transfer credit for up to three seminars. While completing the twelve-seminar requirement, students are expected to write six term papers at the rate of one per quarter.

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, 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 (a) knowledge in depth of two foreign languages, (b) a reading ability in French, German, Italian, or Spanish, (c) when the student's field of concentration demands it, a reading ability in a classical or non-Western language (Greek, Latin, Chinese, Arabic, etc.). A student in the program is expected to attend graduate seminars given in the original language or undertake guided independent study in three literatures, one of which can be English or American.

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 student's 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.

Literature

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 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.

MASTER'S DEGREE PROGRAM

The Master's Degree Program is intended to meet the needs of two groups: (1) 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; and (2) Graduate students, whether full-time or part-time, who, in exceptional circumstances, are admitted to the graduate program with the aim of proceeding to the Master's Degree only. The M.A. degree is currently available in four fields: English/American, French, German, and Spanish. 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 weeks before the beginning of the quarter in which the applicant proposes to begin study. Those planning to apply should take the Graduate Record Examination, including the advanced examination in the literature of the student's field, 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.
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 UC San Diego may be applied toward this eight-unit requirement.
3. Four units of literature written 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.
4. Eight units of guided research, culminating in an acceptable master's thesis or master's examination.

Courses

NOTE: A LIST OF SPECIFIC COURSE OFFERINGS (WITH NAMES OF INSTRUCTORS FOR THE 1980-81 ACADEMIC YEAR) WILL BE AVAILABLE IN THE UNDERGRADUATE OFFICE OF THE DEPARTMENT OF LITERATURE.

LOWER-DIVISION STUDENTS ARE ENCOURAGED TO ENROLL IN CERTAIN UPPER-DIVISION COURSES OFFERED BY THE DEPARTMENT OF LITERATURE. INTERESTED LOWER-DIVISION STUDENTS SHOULD CONTACT THE DEPARTMENT OF LITERATURE UNDERGRADUATE OFFICE FOR ADVICE AS TO WHICH COURSES WOULD BE MOST SUITABLE TO THEIR INTERESTS AND ABILITY.

UNDERGRADUATE STUDENTS MAY ENROLL IN GRADUATE SEMINARS FOR A LETTER GRADE. A LIST OF SEMINARS OPEN TO UNDERGRADUATE STUDENTS WILL BE AVAILABLE AT THE UNDERGRADUATE OFFICE OF THE DEPARTMENT OF LITERATURE.

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 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 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 253. The New Literatures (4)

A study of styles and forms of prose and poetry — the literature — in various languages being developed in "emerging nations." May be repeated for credit as topics vary.

Lit/Co 261. Comparative Literature: History and Theory (4)

An introduction to the intellectual origins, the tools of research, and the principal aims of comparative literature.

Lit/Co 262. Comparative Prosody (4)

The course will investigate the essentials or "universals" of versification on the basis of examples chosen from various literatures, including an oriental one, as well as the methodological problems that such investigation raises. May be repeated for credit as topics vary.

Lit/Co 263. Theory and Practice of Translation (4)

Designed to examine different theories of translation in order to arrive at a perspectivism from which an objective basis for the art of translation may be formed. May be repeated for credit as topics vary.

Lit/Co 271. Critical Theory (4)

Problems of literary analysis, competing schools and major figures in literary criticism. May be repeated for credit as topics vary.

Lit/Co 272. Literature and Social History (4)

Special topics in practical criticism involving social and economic historical perspectives. May be repeated for credit as topics vary.

Lit/Co 273. Art and Literature (4)

An investigation into themes and styles common to literature and visual arts. May be repeated for credit as topics vary.

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 275. Literature and Music (4)

A study of selected topics in the interrelationship of poetry, drama, and music. May be repeated for credit as topics vary.

Lit/Co 276. The Modern Theatre (4)

A study of plays and dramatic theory from the eighteenth century to the present. May be repeated for credit as topics vary.

Lit/Co 277. Psychoanalytic Approaches to Literature (4)

A systematic study of basic psychoanalytic theory as it applies to literary criticism with practical psychoanalytical exploration of works from various periods and literatures. May be repeated for credit as topics vary.

Lit/Co 278. Communications and Literature (4)

The study of literary texts from the twin vantage points of communications theory and literary theory. The examination of how qualities of a text such as those of message, symbol, and image have related significance in accordance with the evaluative categories of both these disciplinary areas. May be repeated for credit as topics vary.

Lit/Co 279. Literary Studies and Linguistics (4)

Fundamentals of linguistics. The relationship of literary theories and current linguistic theory. Examination of formalist and structuralist analysis of literary texts.

Lit/Co 280. Introduction to Computer Applications to Literary Study (4)

For literature students without previous experience with computers. Introduces students to the basic vocabulary, availability of software, hardware, computer programs for textual editing, concordance preparation, stylistic analysis, etc. Prepares students to carry on analysis of literary texts unavailable through conventional means, e.g., stylistic analysis, variation for spoken or written language norms, determination of unknown authors, etc.

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.)

Lit/Co 298. Special Projects (4)

Treatment of a special topic 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 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.

NOTE: 21R, 22R, and 23R may be taken in sequence in partial fulfillment of the Revelle humanities requirement.

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. Shakespeare and the Nature of Man (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.

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 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 unsurpassed satirical writing, widespread speculation on aesthetic experience as critical premises shifted from classic to romantic, and exuberant creativity in the varied works of such authors as Pope, Swift, Gibbon, Burke, Johnson, and Blake.

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 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 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.

Literature

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 revulsion 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 144. The English Novel: Nineteenth Century (4)

A study of the English novel in the age of Sir Walter Scott, Charlotte and Emily Brontë, Charles Dickens, George Eliot, and Anthony Trollope.

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 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 152. The Origins of American Literature (4)

Readings and lectures in American writing from the Puritans to the early national period (1620-1830), with emphasis on the "crisis" 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, and Whitman during the period 1836-1865, when the role of American writing in the national culture becomes an overriding concern.

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, and Stephen Crane, 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 the age of Pound and Eliot, Hemingway and Faulkner, Stevens and Williams. May be repeated for credit as topics vary.

Lit/En 159. Contemporary American Literature (4)

Studies in the literature of our own time.

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, Eliot, 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, Faulkner, and others. Lectures will set the appropriate context.

Lit/En 181. Literature of the English-Speaking Caribbean and Africa (4)

Course readings will be on contemporary fiction from these areas with special attention to historical and cultural relations between these countries and England, the former colonial power.

Lit/En 182. Development of Afro-American Literature (4)

A cross-genre survey of major themes in black literature from its beginnings to the present, with primary emphasis on contemporary black literature.

Lit/En 183. Literary Images of Black Women (4)

This course is structured around the idea that there are three basic images of the black woman, that held by society, that held by black men, and the one held by the women themselves. The course will explore all three views with special emphasis on the way black women view themselves.

Lit/En 184. Contemporary Black Literature (4)

An examination of major developments of black literature from 1940 to the present.

Lit/En 185. Black Prose

The analysis and discussion of the novel, the autobiography, the essay, and collected short fiction by Afro-American writers, with particular emphasis upon the developing prose styles of the writers and the study of the texts in relation to its historical era.

Lit/En 186. Harlem Renaissance (4)

Study of the major works of Afro-American writers who came to prominence during the twenties and thirties. *Home to Harlem*, *Fine Clothes to the Jew*, *Passing*, etc.

Lit/En 187. Black Music/Black Texts: Communication and Cultural Expression (4)

Explore 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 191. History and Literature (4)

This course, whose topic and instructors will vary from quarter to quarter and year to year, will explore a period or problem in culture through the integrated study of literary works as well as the more traditional forms of historical materials. Literary works and historical materials will be considered as complementary forms of "documentation."

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 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 major 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 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/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

Ordinarily students entering the French literature program elect the following sequence: Lit/Fr 10, 25 and 50.

Lit/Fr 10. Readings and Interpretations (4)

The course is taught entirely in French and emphasizes the development of reading ability, listening comprehension, and writing skills. It includes grammar review, lectures and class discussions. 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 25 and Literature 50. For information on prerequisites, contact the Undergraduate Office of the Department of Literature. Successful completion of Lit. 10 satisfies the requirement for language proficiency in Revelle College.

Lit/Fr 25. Composition and Conversation (4)

A course designed for students who wish to improve their ability to speak and write French. *Prerequisite:* Lit. 10 or consent of instructor.

Lit/Fr 50. Readings in French Literature and Culture (4)

An introduction to French literature. May be taken for three quarters starting with any quarter. Reading and discussion of selections from French literature, scholarship, and science. *Prerequisite:* Lit. 10. *Basic Language Program proficiency, or consent of instructor.*

Upper Division

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/Fr 110A-B-C. Themes in French Intellectual and Literary History (4-4-4)

This three-quarter sequence is designed as an introduction to French literature and literary history. Each quarter will center on a specific period or problem. It is recommended that majors whose primary literature is French take this sequence as early as possible. *Prerequisites:* 110A for 110B, 110B for 110C. May be taken out of normal order only by consent of instructor.

110A *Nineteenth and Twentieth Centuries*

110B *Seventeenth and Eighteenth Centuries*

110C *Medieval and Renaissance*

(The chronological order is reversed in order to reduce difficulties.)

Lit/Fr 115. 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. Taught in French.

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 128. Literature of the French-Speaking Caribbean and Africa (4)

The course will consider contemporary writing from the French-speaking Caribbean and Africa, north and south of the Sahara, in the context of the historical and cultural relations of the different regions to each other and to France, the former colonial power.

Lit/Fr 129. African Literature of French Expression (4)

Literature of the modern French-speaking Caribbean will be considered in its socio-historical context, with special attention to different interpretations by Caribbean writers of the significance of the region's complex African and European heritage.

Lit/Fr 140. 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. *Prerequisite:* Lit/Fr 25.

Lit/Fr 151. 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 152. Literature and Ideas (4)

This course will center on writers or movements of international literary cultural or ideological significance. The texts studied will be read in the original language. May be repeated for credit as topics vary.

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 section in a single quarter. *Prerequisites:* upper-division standing and permission of department.

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 211. 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. Sixteenth-Century French Literature (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 224. 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 231. Eighteenth-Century French Literature (4)

Consideration of one or more major figures, texts, or trends in eighteenth century French literature.

Lit/Fr 241. 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 251. Twentieth-Century French Literature (4)

Selected topics in modern French literature and thought. May be repeated for credit as topics vary.

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 individual or small groups. Offered for repeated registration. (S/U grades only.)

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.)

Lit/Fr 298. Special Projects (4)

Treatment of a special topic in French literature. Offered for repeated registration. (S/U grades only.)

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 2A-B-C. The Literary Heritage (4-4-4)

A study of masterpieces from antiquity to the present, emphasizing three major ways of understanding the human condition and three successive moments in the history of civilization when each of these perspectives was particularly important, first, an age of religious faith, when belief in the supernatural pervaded culture, second, an age when supernaturalism was questioned, and the powers formerly reserved for the gods were increasingly assigned to the human imagination, and last, an age which distrusted idealistic conceptions of man and instead often stressed the conditioning power of social and material contexts.

2A *Literature and the Gods*

2B *Literature and the Imagination*

2C *Literature and Society*

Lit/Gen 4A-B-C. Fiction and Film in Twentieth-Century Societies (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 specifically the Spanish-speaking, French-speaking, and German-speaking peoples. All reading will be in English translation. (Texts will be available also in the original language for students who read it.)

4A *Germany, Austria, and Switzerland*

4B *France*

4C *Spain and Latin America*

Lit/Gen 6A-B-C. Understanding Literature (4-4-4)

An introduction to the reading and interpretation of the major literary forms — fiction, poetry, and drama — through selected readings from various periods and cultures.

6A *Fiction*

6B *Poetry*

6C *Drama*

Lit/Gen 8A-B-C. Third World Literatures (4-4-4)

An introduction to the cultures of various Third World countries, through close reading of selected literary texts. Topics will vary each quarter.

Lit/Gen 19A-B-C. The Greco-Roman World (4-4-4)

An introductory study of the Greco-Roman world: its literature, myth, art, philosophy, and history.

Upper Division

Lit/Gen 104. 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, apocryphal works relat-

Literature

ing to the Bible and legendary material about Biblical personalities. Texts include Genesis, Exodus, Isaiah, Song of Songs, Daniel, Luke, Acts, Revelation, Enoch, IV Esdras, Tobit, Judith, the Gospel of Nicodemus, the Apocalypse of Paul.

Lit/Gen 105. Religious Experience in Literature (4)

Literary works from various cultures and periods, dealing with religious themes. May be repeated for credit as topics vary.

Lit/Gen 106. The Christian Experience in Literature (4)

Literary works from various cultures and periods, dealing with Christian themes. May be repeated for credit as topics vary.

Lit/Gen 107. New Testament Literature (4)

A study of the New Testament from the point of view of historical scholarship and literary criticism. May be repeated for credit as topics vary.

Lit/Gen 108. 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 109. 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 110. 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.

Lit/Gen 111. 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 112. 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 parallelism. Comparison with Canaanite and Mesopotamian examples.

Lit/Gen 113. 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 114. Hebrew Literature: The Modern Period (4)

Selected topics in modern Hebrew literature.

Lit/Gen 115. Topics in the Prophets (4)

Study of a single book, period, or issue in the Biblical prophets.

Lit/Gen 116. Topics in Biblical Narrative (4)

Study of a single book, period, or issue in the narrative books of the Bible.

Lit/Gen 117. Topics in Biblical Poetry (4)

Study of a single book, period, or issue in the poetic books of the Bible.

Lit/Gen 118. Interpreting the Bible in the Twentieth Century (4)

Part 1: Study of the techniques of doing honest interpretation of the Bible through various perspectives: literary, historical, archaeological, theological, psychological. Examination of texts from the narrative, poetic, and prophetic books of the Bible. Part 2: Applying these techniques to the study of specific concepts and issues in the Bible, including ethics and law, justice and mercy, war and peace, man and woman.

Lit/Gen 119. Mythology (4)

A study of various bodies of myth, their content, form, and meaning. May be repeated for credit as topics vary.

Lit/Gen 120. The Classical Tradition (4)

Greek and Roman literature in translation. May be repeated for credit as topics vary.

Lit/Gen 123. Studies in Eighteenth-Century European Literature (4)

Topics to be considered include: the age of sensibility, enlightenment, neo-classicism. Attention given to historical and cultural contexts. In translation.

Lit/Gen 124. 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.

Lit/Gen 125. 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 126. 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 127. 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 128. 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 129. Lyric Poetry (4)

Studies in lyric poetry. Not confined to a single national literature. Texts may be read in English.

Lit/Gen 130. Introduction to Criticism (4)

Theories of criticism and the role and function of critic and artist in society.

Lit/Gen 135. 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 analyses of Lukacs with the uses of history in the Third World Novel.

Lit/Gen 137. Introduction to Literature of Modern Africa (4)

This course traces the rise of modern literature in traditional African societies disrupted by the colonial and neo-colonial experience.

Lit/Gen 138. 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 140. Nineteenth-Century Russian Literature in Translation (4)

A study of literary works from nineteenth-century Russia. All readings will be in English. May be repeated for credit as topics vary.

Lit/Gen 141. Twentieth-Century Russian Literature in Translation (4)

A study of literary works from twentieth-century Russia, including the Soviet period. All readings will be in English. May be repeated for credit as topics vary.

Lit/Gen 142. Genres in Russian Literature in Translation (4)

An examination of one or more genres in 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 144. 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 145. French Literature in Translation (4)

One or more periods of authors in French literature. Texts may be read in English. May be repeated for credit as topics vary.

Lit/Gen 146. 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 148. 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 149. 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 150. 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 152. Literature and Ideas (4)

This 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 154. 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 156. German Literary Prose in Translation (4)

The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

Lit/Gen 157. 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 *shetl*, 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 159. 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 161. The Forms of Folklore (4)

A survey of the range of folkloric 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 162. 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 163. 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 164. 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 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. (P/NP grades only.)

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.

Graduate

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 fifty 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 fifty 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 fifty 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 fifty 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 (2-4)

Consideration of pedagogical methods appropriate to undergraduate teaching in Warren College courses under the supervision of instructor of course. Doctoral students in literature are required to participate in undergraduate teaching for a minimum of twelve units (two to four units per quarter) prior to completion of the Ph.D. degree. This requirement is the equivalent of a fifty percent teaching assistantship (four units per quarter for three quarters). May be repeated for credit. (S/U grades only.)

GERMAN LITERATURE

Lower Division

Lit/Ge 10. 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 15 and Literature 25. For information on prerequisites, contact the Undergraduate Office of the Department of Literature. Successful completion of Lit 10 satisfies the requirement for language proficiency in Revelle College.

Lit/Ge 15. Advanced Readings and Interpretations (4)

Continuation of German 10 for those students who intend to practice their reading abilities, listening comprehension, and writing skills on a more advanced level. *Prerequisite:* Lit/Ge 10 or consent of instructor.

Lit/Ge 25. Composition and Conversation (4)

A course designed for students who wish to improve their ability to speak and write German. *Prerequisite:* Lit/Ge 15 or equivalent or consent of instructor.

Lit/Ge 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/Ge 25, 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. Additional prerequisites may be specified below.

Lit/Ge 101. German Literary Prose (4)

The development of major forms and modes of German literary prose. May be repeated for credit as topics vary.

Lit/Ge 102. German Dramatic Literature (4)

The development of the drama in Germany. May be repeated for credit as topics vary.

Lit/Ge 103. German Poetry (4)

The development of major forms and modes of German verse. May be repeated for credit as topics vary.

Lit/Ge 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/Ge 124. Nineteenth-Century German Literature (4)

Major literary works, authors, or movements of the nineteenth century. May be repeated for credit as topics vary.

Lit/Ge 125. Twentieth-Century German Literature (4)

Major literary works, authors, or movements of the twentieth century. May be repeated for credit as topics vary.

Lit/Ge 140. 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 analysed to establish stylistic criteria and guiding principles. One composition per week on various subjects. *Prerequisite:* upper-division standing or consent of instructor.

Lit/Ge 149. 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/Ge 151. 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/Ge 152. 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/Ge 153. 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/Ge 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/Ge 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/Ge 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/Ge 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/Ge 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/Ge 203. Cultural History of the German Language (4)

Philological survey of the German language with particular attention to historical, cultural, and social interrelations.

Lit/Ge 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/Ge 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/Ge 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/Ge 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/Ge 241. German Romantic Prose (4)

A study of the critical and poetic works of major romantic writers with special attention to romantic poetics. May be repeated for credit as topics vary.

Lit/Ge 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/Ge 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/Ge 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/Ge 271. Theory of Genres (4)

An historical approach to the lyric, epic, dramatic, and related distinctions, concentrating on the critical reflection and innovative practice of the "German movement" (from Lessing and the Sturm und Drang to the Romantik.) May be repeated for credit as topics vary.

Lit/Ge 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/Ge 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/Ge 295. M.A. Thesis (1-8)

Research for the master's thesis. Opened for repeated registration up to eight units. (S/U grades only.)

Literature

Lit/Ge 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/Ge 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/Ge 298. Special Projects (4)

Treatment of a special topic in German literature. Offered for repeated registration. (S/U grades only.)

Lit/Ge 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)

Fundamentals of Greek grammar, exercises in vocabulary and accidence in reading.

Lit/Gk 2. Intermediate Greek (4)

Continuing instruction in Greek grammar, with reading of single texts. *Prerequisite:* Lit/Gk 1 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/Gr 2 or equivalent.

Lit/Gk 101-102-103. Readings in Greek Literature (4-4-4)

A continuing course in translation of literary, historical, and philosophical works. *Prerequisites:* upper-division standing, 101 for 102, 102 for 103 or consent of instructor.

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

Lower Division

Lit/He 1. Beginning Hebrew (4)

Fundamentals of Hebrew grammar, exercises in vocabulary, accidence, and in reading. Language will be studied in the context of the culture.

Lit/He 2. Intermediate Hebrew (4)

Continuing instruction in Hebrew grammar, with reading of basic texts. *Prerequisite:* Lit/He 1 or equivalent.

Lit/He 3. Intermediate Hebrew, Continued (4)

Continuing instruction in Hebrew grammar, with reading of basic texts. *Prerequisite:* Lit/He 2 or equivalent.

Lit/He 51. Introduction to Readings and Interpretations (4)

Second-year course in Hebrew language and literature. Conversation, composition, grammar review, and an introduction to literary and nonliterary texts. *Prerequisite:* Lit/He 3 or equivalent or consent of instructor.

Lit/He 52. Readings and Interpretations (4)

The course is taught entirely in Hebrew and emphasizes the development of reading ability, listening comprehension, and writing skills. Includes grammar review, lectures, and class discussions. Approximately half of the reading selections are from modern and classical authors, half from nonliterary disciplines — humanities, social sciences, pure and applied sciences. Successful completion of Lit/He 52 satisfies the requirement for language proficiency in Revelle College.

Upper Division

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/He 100. Introduction to Hebrew Literature (4)

Reading and discussion of selections from representative authors of a range of periods: Classical (Biblical), Rabbinic, Medieval, and Modern. Review of grammar as needed.

Lit/He 101. The Development of Hebrew Literature (4)

Study of the development of Hebrew prose and poetry from the Hebrew Bible to modern Hebrew literature through the study of texts from several major periods. *Prerequisite:* Lit/He 52 or permission of the instructor.

Lit/He 102. Hebrew Literature: Biblical and Modern (4)

Reading, discussion, and comparison of Biblical literature (prose and poetry) and modern Hebrew literature (prose and poetry). *Prerequisite:* Lit/He 52 or consent of instructor.

Lit/He 110. 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.

Lit/He 111. 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/He 112. 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/He 113. 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/He 114. Hebrew Literature: The Modern Period (4)

Selected topics in modern Hebrew literature.

Lit/He 115. Topics in the Prophets (4)

Study of a single book, period, or issue in the Biblical prophets.

Lit/He 116. Topics in Biblical Narrative (4)

Study of a single book, period, or issue in the narrative books of the Bible.

Lit/He 117. Topics in Biblical Poetry (4)

Study of a single book, period, or issue in the poetic books of the Bible.

Lit/He 118. Interpreting the Bible in the Twentieth Century (4)

Part 1: Study of the techniques of doing honest interpretation of the Bible through various perspectives: literary, historical/archaeological, theological, psychological. Examination of texts from the narrative, poetic, and prophetic books of the Bible. Part 2: Applying these techniques to the study of specific concepts and issues in the Bible, including ethics and law, justice and mercy, war and peace, man and woman.

Lit/He 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/He 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/He 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.

Graduate

Lit/He 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/He 298. Special Projects (4)

Treatment of a special topic in Hebrew literature. Offered for repeated registration. (S/U grades only.)

ITALIAN LITERATURE

Lower Division

Lit/It 1. Beginning Italian (4)

Fundamentals of Italian grammar, exercises in vocabulary, accidence, and in reading.

Lit/It 2. Intermediate Italian (4)

Continuing instruction in Italian grammar, with reading of simple texts.

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.

Lit/It 101. Advanced Readings and Conversation in Italian Literature (4)

Advanced course in Italian conversation and literature with an emphasis based on Italian literary texts.

Lit/It 121. Studies in Medieval Lyric Poetry

Studies in the Italian lyric tradition from the Scuola Siciliana through the Stilnovisti to Dante and Petrarca.

Lit/It 122. Italian Renaissance (4)

A study of representative authors of the Renaissance and its forerunners, from the fourteenth through sixteenth centuries. May be repeated for credit as topics vary.

Lit/It 123. 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 147. Romantic Poetry (4)

Works of Foscolo, Manzoni, and Leopardi.

Lit/It 148. Italian Literature (4)

One or more periods of authors in Italian literature. May be repeated for credit as topics vary.

Lit/It 151. Dante (4)

A critical reading of the *Divina Commedia*.

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 215. Dante (4)**

A study of the poet, his cultural background, and his political-historical mission.

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)**

Fundamentals of Latin grammar, exercises in vocabulary, accidence, and in reading.

Lit/La 2. Intermediate Latin (4)

Continuing instruction in Latin grammar, with reading of simple texts. *Prerequisite:* Lit/La 1 or 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 2 or equivalent.

Lit/La 101-102-103. Readings in Latin Literature (4-4-4)

A continuing course in translation of literary, historical, and philosophical works. *Prerequisites:* upper-division standing, 101 for 102, 102 for 103, or consent of instructor.

Lit/La 198. Directed Group Study (4)

Directed group study 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.

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 25. Reading and Interpretation (4)**

The course is taught entirely in Russian and emphasizes the development of reading ability, listening comprehension, and writing skills. It includes grammar review, lectures, and class discussions. Approximately half of the reading selections are from modern and classical authors, half from nonliterary disci-

plines (humanities and social sciences) and current Soviet newspapers and journals. *Prerequisite:* for information on prerequisites, contact the Undergraduate Office of the Department of Literature.

Lit/Ru 50. Readings in Russian Literature (4)

An introduction to Russian literature, with continuing instruction in grammar, conversation, and composition. *Prerequisite:* Lit/Ru 25 or consent of instructor.

Upper Division

Prerequisite: upper-division standing or consent of instructor. Additional prerequisites may be specified below.

Lit/Ru 140. Nineteenth-Century Russian Literature (4)

A study of literary work from nineteenth-century Russia. May be repeated for credit as topics vary.

Lit/Ru 141. Twentieth-Century Russian Literature (4)

A study of literary works from twentieth-century Russia, including the Soviet period. May be repeated for credit as topics vary.

Lit/Ru 142. 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 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.

**LITERATURE AND SOCIETY:
THIRD WORLD LITERATURES****Lower Division****Lit/Soc 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. Topics will vary each quarter.

SPANISH LITERATURE**Lower Division**

Lit/Sp 10, 25, 50 are designed as an intermediate sequence which will prepare students with a basic proficiency in Spanish for upper-division literature courses.

Lit/Sp 9. Readings and Interpretations: Spanish for Native Speakers (4)

Spanish for native speakers is an intensive course designed to develop performance skills (speaking, listening, reading, and writing) of students with native bilingual skills through grammar reviews, class discussions, compositions, and readings from Chicano and Latin American authors. Prepares students for Spanish 10, 25, 50.

Lit/Sp 10. Readings and Interpretations (4)

The course is entirely taught in the language of the literature concerned and emphasizes the development of reading ability, listening comprehension, and writing skills. It includes grammar review, lectures, and class discussions. The course is designed to prepare students for Literature 25 and Literature 50. *Prerequisites:* for information on prerequisites, contact the Undergraduate Office of the Department of Literature. Lit/Sp satisfies the requirement for language proficiency in Revelle College.

Lit/Sp 24. Composition and Conversation: Spanish for Native Speakers (4)

This course is designed for native speakers who have had formal training in the language but who need to expand their knowledge of grammar, vocabulary, and idiomatic expressions both at the speaking and writing level. Readings will be from Chicano and Latin American authors. Equivalent of Lit/Sp 25.

Lit/Sp 25. Composition and Conversation (4)

A course designed for students who wish to improve their ability to speak and write Spanish. It is a continuation of Lit/Sp 10 with special emphasis on problems in writing and interpretation. *Prerequisite:* Lit/Sp 10 or consent of instructor.

Lit/Sp 50. Readings in Spanish Literature and Culture (4)

An introduction to Spanish and Spanish-American 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 Spanish. *Prerequisite:* completion of Lit/Sp 25 or consent of instructor.

Lit/Sp 70. Advanced Composition for Native Speakers (4)

An intensive writing course designed to prepare native Spanish speakers for advanced literature classes. The course will deal with specific composition and grammar difficulties in the writing of short and long papers.

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 101. Topics in Medieval Prose (4)

Readings and discussion of Spanish prose writings from the thirteenth, fourteenth, and fifteenth centuries. 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.

Lit/Sp 110A-B. Major Works of the Renaissance and Baroque (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, Gongora, 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.

Lit/Sp 120. Major Works in the Modern Period: From Feijoo to Galdós (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.

Literature

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 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 of major trends in Argentine literature, such as gaucho poetry, the realist novel, modern urban narrative, the school of Jorge Luis Borges. May be repeated for credit as topics vary.

Lit/Sp 135. Mexican Literature (4)

Study of movements, traditions, key authors or major trends in Mexican literature such as the romantic movement, modernist poetry, the novel of the Mexican Revolution, popular literature, post-Revolutionary poetry, authors such as Paz, Rulfo, Fuentes. 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, Arguedas, 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-Caribbean 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 for credit 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 with a meaningful definition of Chicano theatre through the discussion and interpretation of major dramatic works, both past and present.

Lit/Sp 155. The Social Aspects of Chicano Literature (4)

This course examines and analyzes some specific relationships between Chicano literature and the social unit, such as the role that the Chicano and non-Chicano publishing company plays in the history of Chicano literature, 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 socio-linguistic 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 American 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)

Major contemporary critical theories and the question of their applicability to contemporary Latin American, Peninsular Spanish and/or Chicano literature.

Lit/Sp 171. Studies in Literature and Society (4)

Focus on interaction between literary expression and the focus 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 175. Themes in Brazilian Literature (4)

Consideration of selected writers, texts, or problems in Brazilian literature.

Lit/Sp 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/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 with the linguistic and cultural background necessary to go on to more work in depth in the medieval field. May be repeated for credit as topics vary.

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 discussions 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 & 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 271. Literary Theory (4)

Problems and approaches to literary theory in the context of Spanish and Spanish-American literature. May be repeated for credit as topics vary.

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 collection in the Spanish Peninsula. Offered for repeated registration.

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. *Prerequisite: advancement to candidacy for the Ph.D. degree* (S/U grades only.)

WRITING/LITERATURE

Upper Division

Fiction**Lit/Writing 100. Short Fiction (Beginning) (4)**

A workshop for students with little previous experience writing prose fiction. This workshop is designed to encourage regular writing in the short forms of prose fiction and to permit beginning students to experiment with various forms. Instructor and students will discuss student work and selected short fiction of professionals.

Lit/Writing 101. Short Fiction (Advanced) (4)

A workshop for students with some experience and special interest in writing prose fiction. This workshop is designed to encourage regular writing in short forms of prose fiction. Instructor and students will discuss student work and selected short fiction of professionals. *Prerequisite: Lit/Writing 100 or consent of instructor.*

Lit/Writing 102. Poetry (Beginning) (4)

A workshop for students with little previous experience writing poetry. This workshop is designed to encourage regular writing of poetry and to permit beginning students to experiment with various forms. Instructor and students will discuss student work and selected poems of professionals.

Lit/Writing 103. Poetry (Advanced) (4)

A workshop for students with some experience and special interest in writing poetry. This workshop is designed to encourage regular writing of poetry. Instructor and students will discuss student work and selected poems of professionals. *Prerequisite: Lit/Writing 102 or consent of instructor.*

Lit/Writing 104. The Novel (4)

A workshop designed to encourage writing of longer narrative forms. Instructor and students will discuss student work, as well as published novels. *Prerequisite: Lit/Writing 100 or 101 or consent of instructor.*

Lit/Writing 105. Dramatic Writing (4)

A workshop designed to encourage writing of stage plays, radio plays, and video or screen scripts. Instructor and students will discuss student work and selected plays and scripts of professionals.

Lit/Writing 106. Translation of Literary Texts (4)

The course centers on issues in the theory and practice of literary translation. Students should have reasonably good capability 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.

Lit/Writing 107. General Fiction Workshop (4)

A workshop in the writing of all forms of fiction. This workshop is usually limited to advanced students in the writing major. Students will pursue their own fiction-writing projects, discussing their work in progress with the instructor and other students. *Prerequisites: Lit/Writing 101 or 103 and consent of instructor.*

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, first hand biography, and first hand chronicle. Instructor and students will discuss student work, as well as published personal narratives.

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.

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. NOTE: Writing majors/minors or science majors may take this course.

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.

NOTE: Writing majors/minors or social science majors may take this course.

Lit/Writing 124. Writing Literary Criticism (4)

A workshop designed to encourage regular writing of literary criticism. Instructor and students will discuss student work.

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.

Lit/Writing 127. General Nonfiction Prose Workshop (4)

A workshop designed to encourage the writing of all forms of nonfiction prose. This workshop is usually limited to advanced students in the writing major. *Prerequisites: Lit/Writing 120, 121, 124, or 125 and consent of instructor.*

Writing Process, Written Discourse, and Writing Pedagogy

These courses are not writing workshop courses like those listed above. Rather, they examine various aspects of writing as a field of study and of writing pedagogy. Writing majors who plan to teach writing may be particularly interested in these courses. Students majoring in literature may count two of these courses toward the requirements in literature.

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 the 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 UC San Diego college writing programs or tutor freshman students in those programs.

Mathematics

Lit/Writing 145. Producing the Little Magazine (4)

A practical course involving the actual production of a journal. Includes study of the history of the Little Magazine and of editorial practices.

Teaching Practica, Directed Study and Special Study

Students majoring in literature may count Lit/Writing 195 towards requirements for the major in literature.

Lit/Writing 195. Apprentice Teaching in the Muir College Writing Program (0 and 4)

In this course students will tutor freshmen in Muir writing courses. In addition, they will participate in a seminar on the theory and practice of tutorial instruction in writing. (P/NP grades only.)

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. May be taken for credit three times. (P/NP grades only.) Prerequisites: upper-division standing and permission of department.

Lit/Writing 199. Special Studies (2 or 4)

Tutorial individual guidance in areas of writing not normally covered in courses. May be taken for credit three times. (P/NP grades only.) Prerequisites: upper-division standing and permission of department.

Writing majors who choose to take a lower-division writing course to fulfill the writing course requirements (in addition to the six upper-division writing workshops) may choose one of the following:

Muir College 30: Creative Writing

Warren College 11: Writing Workshop

Warren College 12: Poetry

Warren College 13: Research Writing

Warren College 14: Technical Writing

Warren College 15: Journalism

Warren College 16: Writing for Publication

Though they may not be substituted for the six upper-division writing workshops, the following courses may be of interest to writing majors:

Lit/Fr 140: Composition and Stylistics

Lit/Ge 140: Composition and Stylistics

Lit/Sp 166: Creative Writing

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 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.

MATHEMATICS

OFFICE: 7313 Applied Physics and Mathematics Building, Muir College

Professors:

Donald W. Anderson, Ph.D.
Edward A. Bender, Ph.D.
Errett A. Bishop, Ph.D.
John W. Evans, M.D., Ph.D.
Jay P. Fillmore, Ph.D.
Carl H. FitzGerald, Ph.D.
Theodore T. Frankel, Ph.D.
Adriano M. Garsia, Ph.D.
Ronald K. Getoor, Ph.D.
William B. Gragg, Jr., Ph.D.
Hubert Halkin, Ph.D.
J. William Helton, Ph.D.
Richard A. Olshen, Ph.D.
Eric Reissner, Ph.D.
Burton Rodin, Ph.D., *Chairman*
Helmut Röhrli, Ph.D.
Murray Rosenblatt, Ph.D.
Michael J. Sharpe, Ph.D.
Lance W. Small, Ph.D.
Harold M. Stark, Ph.D.
Stefan E. Warschawski, Ph.D.
(*Emeritus*)
Stanley G. Williamson, Ph.D.
Daniel E. Wulbert, Ph.D.

Associate Professors:

James R. Bunch, Ph.D.
Thomas J. Enright, Ph.D.
Michael H. Freedman, Ph.D.
Leonard R. Haff, Ph.D.
James P. Lin, Ph.D.
Alfred B. Manaster, Ph.D.
John A. Rice, Ph.D.
Norman A. Shenk, Ph.D.
Donald R. Smith, Ph.D.
Audrey A. Terras, Ph.D.
Adrian R. Wadsworth, Ph.D.
John Wavrik, Ph.D.

Assistant Professors:

Gunnar Carlsson, Ph.D.
Ronald J. Evans, Ph.D.
Jeffrey B. Remmel, Ph.D.

Lecturers in Mathematics:

Patrick J. Ledden, Ph.D.
Frank B. Thiess, Ph.D.

James A. Koziol, Ph.D., *Associate Adjunct Professor*

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

Before entering, each freshman student is given an examination to determine his or her grasp of high school mathematics. The object is to advise in the selection of an appropriate freshman mathematics sequence. The possible choices are as follows:

Mathematics 5A-B-C is a liberal arts course in mathematics. It is taken mostly by students with two years of high school mathematics who will not pursue more advanced work. For the first two quarters, topics in geometry are discussed. The third quarter is an introduction to calculus. (This course fulfills the mathematics option of the general-education requirements of Muir College and completion of two quarters fulfills the requirement of Third College.)

Mathematics 4B and 4C are separate courses for students with weak backgrounds in high school mathematics. Mathematics 4B is algebra. Mathematics 4C is trigonometry.

Mathematics 1A-B-C is calculus. The students have completed two years of high school mathematics. This course is acceptable for majors in liberal arts, economics, and 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.)

Mathematics 2A-B-C is calculus. Most of the students have completed four years of high school mathematics. Many have previously taken short, introductory calculus courses. This sequence is required for certain majors including mathematics, physics, chemistry, and EECS. (It fulfills the same college requirements as Mathematics 1A-B-C.)

Students with exceptionally strong backgrounds in mathematics should consider advanced placement or the honors calculus sequence 2AH-BH-CH.

Certain transfers from one sequence to another 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, should follow Mathematics 1A with 2A and receive two units of credit for 2A, and may, by petition, follow 1B or 1C with 2B and receive two units credit for 2B. Where there is substantial overlap among courses in different sequences, full credit is given only once. Credit will not be given for courses taken simultaneously from the Mathematics 1 sequence and the Mathematics 2 sequence.

Minor in Mathematics

The requirements for a minor in mathematics vary with the major and the college. Students should discuss the requirements with their college and major advisers.

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. A major is offered in Revelle, Muir, Third, and Warren Colleges. Foreign languages recommended for mathematics majors are French, German, and Russian.

All students majoring in mathematics will complete the basic sequence 2A-B-C-D-E and at least twelve one-quarter upper-division courses, which *must* include:

- (i) 140A-B
- (ii) 100A-B or 103A-B
- (iii) two complete sequences from the following list: 100A-B-C, 103A-B-102, 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, 190A-B-C.

As with all departmental requirements, more advanced courses on the same material may be substituted with written approval from the departmental adviser.

For the B.A. degree in mathematics, a minimum average of C in the major is required, and in particular a minimum average of C is required in each of the required upper-division sequences. To be prepared for a strong major curriculum, students should complete Mathematics 2D and 2E before the end of their sophomore year. Either Mathematics 140A-B or 100A-B (103A-B) should be taken during the junior year.

The major in John Muir College is required to take Science 4A-B-C or the equivalent. With the approval of his or her major adviser, the Third College major may replace some upper-division mathematics courses with courses in related fields in which mathematics plays a basic role.

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 pamphlet on applied mathematics. The major is offered in Revelle, Muir, Third and Warren Colleges.

All students majoring in applied mathematics are required to complete the following courses:

- (i) 2A-B-C-D-E (2DA may replace 2D, and 2EA may replace 2E.)
- (ii) AMES 10 or EECS 61
- (iii) 80A or 181A
- (iv) 102 or 170A
- (v) One of the following sequences: 100A-B, 103A-B, 140A-B, 170A-B-C, 180A-B-C, 180A-181A-B.
- (vi) Two additional sequences which may be chosen from the list in (v) or the following list: 110-120A-130A, 111A-B, 120A-B, 130A-132A, 171A-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.
- (b) Four units will be waived if an average of B or better is obtained in 2CS-DS-ES or in 80A.

For a B.A. degree in applied mathematics, a minimum average of C in the major is required and, in particular, a minimum average of C is required in (v) and in (vi) above. To be prepared for a strong major curriculum, students should complete Mathematics 2D(A) and 2E(A) before the end of their sophomore year. One of the sequences in (v) should be taken during the junior year.

The Graduate Program

The Department of Mathematics offers a graduate program leading to the M.A. 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 a background in mathematics comparable to the requirements for the undergraduate major in mathematics at this university may apply for admission. All 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 nine units. At least six of these units must be in graduate mathematics courses. The remaining three units must be in upper-division or graduate courses in mathematics-related subjects. 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). (See "Graduate Studies: The Master's Degree.") A total of thirty-six units of course credit is required.

These must include:

1. At least eighteen units of graduate mathematics courses.
2. Not more than nine units of upper-division mathematics courses.
3. Not more than nine units of graduate courses in a related field approved by the department.
4. Not more than six units of Mathematics 500, Apprentice Teaching. 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.

The comprehensive examination will cover basic facts in two topics, one from each group:

Mathematics

1. Algebra or applied algebra or topology.
2. Real analysis or complex analysis.

A detailed list of the depth requirements in each of these areas, with literature references and approved courses, is

Mathematics

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 a program of graduate studies in applied mathematics for regular or part-time students. The program requires one to two years for completion. A total of thirty-six units of course credit is required, of which at least twenty-four units must be in graduate courses. 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, 211A-B, 261A-B-C, 270A-B-C, 271A-B-C, 277A-B-C, 282A-B-C, 284A-B-C. (Not every course is offered each year.) In addition, students will be encouraged to take a one-year sequence in an area outside the mathematics department (computer science, engineering, physics, economics, psychometrics, etc.) Twelve units may be at the upper-division level. Not more than six units can be from Mathematics 500, but they cannot be used for the twenty-four units in graduate courses requirement. No units of Mathematics 299 may be used to satisfy the M.A. requirements. Full-time M.A. students are permitted seven quarters in which to complete all requirements.

Accelerated Master's Degree Program in Applied Mathematics

Undergraduate mathematics majors in their junior year who satisfy certain requirements may apply for early admission to the Department of Mathematics M.A. Program in Applied Mathematics. Students accepted into this program become regular graduate students and must complete all the M.A. in applied mathematics requirements within seven quarters after admission. Students may wish to take graduate mathematics

courses above and beyond the undergraduate requirements during their junior year in order to finish the program in one year.

The applicant must have satisfied (by the end of the junior year):

1. All general-education requirements of his or her college.
2. All mathematics department requirements for the bachelor's degree.
3. An overall and departmental grade-point average of at least 3.5.

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 given near the beginning and end of each academic year. 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. Examinations may be repeated, but 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 written qualifying examinations according to the above schedule will be transferred to an M.A. program in mathematics.

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 examina-

tion 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.

Courses

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 Mathematics 2A previously completed.) Three lectures, two recitations. *Prerequisite:* two years' high school mathematics. (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 Mathematics 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 Mathematics 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:* three or more units of high school mathematics and passing score on placement examination or consent of instructor; one-half unit of trigonometry is desirable. (F,W,S)

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, polar coordinates. Three lectures, one recitation. *Prerequisite:* Math. 2A. (F,W,S)

2C. Calculus and Analytic Geometry (4)

Vector geometry, vector functions and their derivatives. Partial differentiation. Maxima and minima. Double integration. Three lectures, one recitation. *Prerequisite:* Math. 2B. (F,W,S)

2CS. Applications of the Calculus (2)

A supplementary course to 2C in which the calculus is applied to problems in the sciences, engineering, and industry. This course is intended to increase the student's grasp of calculus and awareness of its uses. Elementary programming is taught for use in computer examples. One lecture, one recitation. *Prerequisite:* Math. 2C or concurrent enrollment. (S)

2D. Introduction to Differential Equations (4)

Infinite series. Ordinary differential equations. Three lectures, one recitation. *Prerequisite:* Math. 2C (F,W,S)

2DS. Applications of Differential Equations (2)

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. 2D or 2DA or concurrent enrollment, a knowledge of programming at the level of Math. 2CS. (F)

2E. Matrices and Linear Transformations (4)

Linear equations, matrices, vector spaces, linear transformations, determinants, eigenvalues, orthogonal and unitary transformations, quadratic forms. Systems of differential equations, exponential of a matrix. Three lectures, two recitations. *Prerequisite:* Math. 2D. (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. 2E or concurrent enrollment, a knowledge of programming at the level of Math. 2CS.* (W)

2F. Calculus of Functions of Several Variables (4)

Calculus of vector functions with use of linear algebra. Matrix formulation on the chain rule and the second derivative test for critical points of a function of several variables. Jacobian determinants and change of variable in a multiple integral. Vector fields, line and surface integrals. Stokes' theorem and the divergence theorem. Selected applications. Three lectures, one recitation. *Prerequisite: Math. 2E* (F,W,S)

2DA. Calculus and Analytic Geometry (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. 2B (Math. 2C strongly recommended.)* (F,W)

2EA. Matrices and Linear Transforms (4)

Matrix operations, solutions to linear algebraic equations in unknowns, linear vector spaces, determinants, matrix eigenvalue problem, 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. 2DA. (Math. 2C strongly recommended.)* (W,S)

2AH. Calculus and Analytic Geometry (4)

The material covered in Mathematics 2AH is similar to the material covered in Mathematics 2A. However in this honors course there is a greater emphasis on rigor in the lectures and the students are confronted with tougher problems. Three lectures, one recitation. *Prerequisites: Same as for Math. 2A and consent of instructor.* (F)

2BH-2CH-2EH. Calculus and Analytic Geometry (4-4-4)

The material covered in Mathematics 2BH, 2CH, and 2EH is similar to the material covered in Mathematics 2B, 2C, and 2E. However, in this honors sequence there is greater emphasis on rigor in the lectures, and the students are confronted with tougher problems. The combination of 2BH, 2CH, and 2EH makes a very nice integrated one-year honors sequence in calculus. Three lectures, two recitations. *Prerequisites: calculus at least equivalent to Math. 2A and consent of instructor.* (F,W,S)

4B. Intermediate Algebra (4)

Rational, irrational, and complex numbers, polynomials, factoring, inequalities, systems of linear and quadratic equations, determinants, powers and roots, fractional and radical equations and applications. Cannot be taken for credit after Math. 1 or 2. Four lectures. *Prerequisite: one year of high school algebra.* (F,W)

4C. Elementary Functions (4)

Trigonometric functions and identities, inverse functions, exponentials, logarithms, oblique triangles, numerical methods. Cannot be taken for credit after Math. 1 or 2. Four lectures. *Prerequisite: Math. 6B or Math. 4B or equivalent.* (F,W,S)

5A. Introduction to Mathematics (4)

Topics in Euclidean geometry. The theorems of Ceva and Menelaus, Desargues' theorem, Pappus' theorem, harmonic tetrads. An emphasis is placed upon geometry as an archetype for the development of mathematical systems. Three lectures, one recitation. *Prerequisite: two units of high school mathematics.* (F)

5B. Introduction to Mathematics (4)

Projections, projective geometry, conic sections, Pascal's theorem. Three lectures, one recitation. *Prerequisite: Math. 5A* (W)

5C. Introduction to Mathematics (4)

Basic notions of calculus: functions, differentiation of elementary functions, applications. Definite and indefinite integral and applications. Four lectures, one recitation. *Prerequisite: Math. 5B* (F)

6A-B. Introductory Statistics and Mathematical Analysis (4-4)

Descriptive statistics, measures of location and variability, organization of multivariate data, basic applied probability, random sampling, Central Limit Theorem, Sampling distributions, confidence intervals, hypothesis testing, single population problems, comparisons between two populations, supporting concepts from pre-calculus and calculus. Four lectures, two recitations. *Prerequisite: consent of instructor.* 6A. (F,W), 6B. (W,S)

80A-B. Basic Statistics (4-4)

Analysis of experimental data. Basic probability models — binomial, Poisson, normal. Expectation and variance, sampling models, normal approximation, Unbiased estimation, regression, correlation. Hypothesis testing, including nonparametric tests. Experimental design. Emphasis on application of methods of statistical inference to experimental data. Three lectures, one recitation. *Prerequisite: Math. 1C or 2B or consent of instructor.* (F,W,S)

Upper Division

100A-B-C. Introduction to 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. *Prerequisite: Math. 2E.* (F,W,S)

102. Applied Linear Algebra (4)

A second course in linear algebra from a computational yet geometric point of view. Elementary Hermitian matrices, Schur's theorem, normal matrices and quadratic forms. Moore-Penrose generalized inverse and least square problems. Vector and matrix norms. Characteristic and singular values. Canonical forms. Determinants and multilinear algebra. Three lectures, one recitation. *Prerequisite: Math. 2E.* (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. 2E* (F,W)

104A-B-C. Number Theory (4-4-4)

Topics from elementary and algebraic number theory such as 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. Three lectures. *Prerequisite: consent of instructor.* (F,W,S)

109A-B-C. Undergraduate Seminar (4-4-4)

Reports by students on assigned reading material and/or discussion of assigned problems in areas compatible with the student's background. Designed to develop insight and originality as well as mathematical techniques. *Prerequisite: consent of instructor.* (F,W,S)

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. *Prerequisites: Math. 2C-D-E or consent of instructor.* (F,S)

111A-B. Mathematical Model Building (4)

This course is intended to acquaint students with mathematical model building in fields such as natural science, engineering, science, economics. Instructors from various departments will mathematize specific problems in their fields by extracting the pertinent data and structures from the available information. Three lectures. *Prerequisites: Math. 2C-D-E or consent of instructor.* (F,W) See 211A-B

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. *Prerequisites or co-registration: Math. 2C-D.* (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. *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. 2C-D-E* (W)

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. 2C-D-E* (S)

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. 2D-E 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)

Relations between differential and integral equations, some classical integral equations. Volterra integral equation, 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. 2C-D* (F,W,S)

150A. Differential Geometry (4)

Differential geometry of curves and surfaces. Gauss and mean curvatures, geodesics, parallel displacement, Gauss-Bonnet theorem. Three lectures. *Prerequisite: Math. 2F 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)

160A-B-C. Elementary Mathematical Logic (4-4-4)

Propositional and predicate calculi. Interpretations and formal theories. Completeness theorems. Some decision procedures. An introduction to recursion theory. Undecidability of the predicate calculus. Incompleteness of elementary number theory. Three lectures. *Prerequisite: Math. 100A, 140A, or consent of instructor.* (F,W,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

Mathematics

recursion. Cardinal and ordinal numbers and their arithmetic. *Prerequisite:* Math 100A or 140A or 103 or consent of instructor. (S) (Not offered in 1980-81.)

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. Statistical computations. Linear programming. Three lectures. *Prerequisites:* programming experience and Math 2E. (F)

170B. Numerical Analysis (4)

Rounding and discretization errors. Interpolation and approximation of functions. Numerical differentiation and integration. Solution of polynomial and single nonlinear equations. Three lectures. *Prerequisites:* programming experience and Math 2E. (W)

170C. Numerical Analysis (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. *Prerequisite:* Math 170B. (S)

171A-B. Mathematical Programming (4-4)

Elementary topological properties of Euclidean spaces. Convex sets, separation theorems. Simplexes, Sperner lemma, Brouwer fixed-point theorem, linear programming, duality. Constrained maxima. Kuhn-Tucker theorem, mathematical programming. Three lectures. *Prerequisites:* Math 2C-D-E. (F,W)

172A-B. Topics in Mathematics (4-4)

Topics to be chosen in areas of current mathematical research or application. May be repeated once for credit with different topics. Three lectures. *Prerequisite:* consent of instructor. (W,S)

180A. Introduction to Probability (4)

Probability spaces, independence, conditional probability, random variables, distributions, expectations, joint distributions, central-limit theorem. Three lectures. *Prerequisites:* Math 2C-D. (F)

180B. Introduction to Probability (4)

Random vectors, multivariate densities, covariance matrix, multivariate normal distribution, Poisson process. Other topics if time permits. Three lectures. *Prerequisites:* Math 180A and 2E. (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, queuing theory. Three lectures. *Prerequisite:* Math 180B. (S)

181A. Introduction to 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 2E. (W)

181B. Introduction to Statistics (4)

Goodness of fit, special small sample distribution and use, non-parametric methods, Kolmogorov-Smirnov statistics, sequential analysis. Three lectures. *Prerequisite:* 181A. (S)

182. Introduction to Combinatorics (4)

Combinatorial methods and their computer implementation. Permutations and combinations, generating functions, partitions, principle of inclusion and exclusion, Polya's theory of counting, Hall's theorem, assignment problem, backtrack technique, error-correcting codes, combinatorial optimization problems. Three lectures, one recitation. *Prerequisite:* programming experience. (W)

190A-B. Introduction to Topology with Applications to Analysis (4-4)

Set theory, Zorn's lemma, cardinal and ordinal numbers, Metric spaces, General topological spaces, Metrizable Function spaces, Ascoli's theorem. Three lectures. *Prerequisites:* Math 2C-D. (F,W)

190C. Introduction to Topology with Application to Analysis (4)

The course will develop Euler characteristics and the classification of 2-manifolds. This will be followed by the construction and applications of the Fundamental Group through Van Kampen's theorem, covering spaces, Borsuk-Ulam theorem and the Kurosh subgroup theorem. Three lectures. *Prerequisites:* Math 190A-B. (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 (3-3-3)

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 (3-3-3)

Recommended for all students specializing in algebra. Basic topics include categorical algebra, commutative algebra, group representations, homological algebra, non-associative algebra, ring theory. *Prerequisites:* Math 200A-B-C or consent of instructor. (F,W,S) (Not offered in 1980-81.)

202A-B-C. Applied Algebra (3-3-3)

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 (3-3-3)

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. (W,S)

204A-B-C. Number Theory (3-3-3)

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 to number theory: Hecke theory of the relation between Dirichlet series and modular forms, special automorphic forms such as theta functions, Eisenstein series and applications such as Kronecker limit formula, Rademacher's result of the partition function. *Prerequisite:* consent of instructor. (F,W,S)

207A-B-C. Topics in Algebra (3-3-3)

In recent years, topics have included number theory, commutative algebra, non-commutative rings, homological algebra, and Lie groups. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

208. Seminar in Algebra (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

209. Seminar in Number Theory (1 to 3)

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 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 propagation. *Prerequisite:* Math 210B or consent of instructor. (S)

211A-B. Mathematical Model Building (4-4)

Topics to include arguments from scale, dimensional analysis, graphical methods, techniques of optimization, continuous, discrete, and stochastic models, local stability theory, principles of systems analysis, models and data collection. *Prerequisites:* Math 2D-E and Math 180A. (W,S)

215A-B-C. Mathematical Theory of Process Optimization (3-3-3)

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) (Not offered in 1980-81.)

217A-B-C. Topics in Applied Mathematics (3-3-3)

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. (Not offered in 1980-81.)

218. Seminar in Applied Mathematics (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

220A-B-C. Complex Analysis (3-3-3)

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. Several Complex Variables (3-3-3)

Formal and convergent power series, Weierstrass preparation theorem, Cartan-Rückert 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. (Not offered in 1980-81.)

227A-B-C. Topics in Complex Analysis (3-3-3)

In recent years, topics have included conformal mapping, Riemann surfaces, value distribution theory, extremal length. May be repeated for credit with consent of adviser. *Prerequisite:* consent of instructor.

228. Seminar in Complex Analysis (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

230A-B-C. Ordinary Differential Equations (3-3-3)

Existence and uniqueness theorems. Linear systems with constant and periodic coefficients. Sturm-Liouville theory, Eigenfunction expansions. Stability and asymptotic behavior of nonlinear systems. Poincaré-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. (Not offered in 1980-81.)

231A-B-C. Partial Differential Equations (3-3-3)

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 132A-B or consent of instructor. (Not offered in 1980-81.)

232A-B-C. Calculus of Variations (3-3-3)

Euler-Lagrange equation theory of fields, Hamilton-Jacobi theory, sufficient conditions, Weierstrass E test, Mayer-Lagrange and Bolza problems, Optimal control, Pontryagin's maximum principle, existence theorems, sufficient conditions, Carathéodory's approach to calculus of variations. *Prerequisites:* Math 240A-B-C or Math 10A-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) (Not offered in 1980-81.)

237A-B-C. Topics in Differential Equations (3-3-3)

May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.* (Not offered in 1980-81.)

238. Seminar in Differential Equations (1 to 4)

Prerequisite: consent of instructor. (S/U grades permitted.)

240A-B-C. Real Analysis (3-3-3)

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 (3-3-3)

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.* (Not offered in 1980-81.)

247A-B-C. Topics in Real Analysis (3-3-3)

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.* (Not offered in 1980-81.)

248. Seminar in Real Analysis (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

250A-B-C. Differential Geometry (3-3-3)

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) (Not offered in 1980-81.)

251A-B-C. Lie Groups (3-3-3)

Lie groups, Lie algebras, exponential map, subgroup-subalgebra correspondence, adjoint group, universal enveloping algebra. Structure theory of semi-simple Lie groups, global decompositions, Weyl group. Geometry and analysis on symmetric spaces. *Prerequisites: Math. 200 and 250, or consent of instructor.* (F,W,S) (Not offered in 1980-81.)

257A-B-C. Topics in Differential Geometry (3-3-3)

In recent years, topics have included Morse theory and general relativity. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.* (257C will not be offered in 1980-81.)

258. Seminar in Differential Geometry (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

260A-B-C. Mathematical Logic (3-3-3)

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 Analysis (3-3-3)

This course is an introduction to the computational and theoretical aspects of discrete mathematics. Topics include counting and listing, analysis of algorithms, graphs and trees, discrete max-min theory, error correcting codes and designs. *Prerequisites: (may be taken concurrently) ability to program BASIC, ALGOL, or FORTRAN Math. 100A-B or Math. 103A-B.* (F,W,S)

262A-B-C. Topics in Combinatorial Mathematics (3-3-3)

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.* (Not offered in 1980-81.)

267A-B-C. Topics in Mathematical Logic (3-3-3)

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.) (Not offered in 1980-81.)

268. Seminar in Logic (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

269. Seminar in Combinatorics (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

270A-B-C. Numerical Mathematics (4-4-4)

Accuracy of numerical calculations, interpolation; numerical quadrature; continued fractions in numerical analysis, determination of the zeros of a polynomial; elimination methods for linear equations; eigenvalue problem for Hermitian matrices, eigenvalue problem for general matrices; iterative methods of linear equations. *Prerequisites: Math. 2D, 2E, 140A, or advanced calculus and programming experience.* (F,W,S)

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)

277A-B-C. Topics in Numerical Mathematics (3-3-3)

In recent years, topics have included numerical aspects of complex analysis and ordinary and partial differential equations. May be repeated for credit with consent of adviser. *Prerequisite: consent of instructor.* (Not offered in 1980-81.)

278. Seminar in Numerical Mathematics (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

280A-B-C. Probability Theory (3-3-3)

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 (3-3-3)

Testing and estimation, sufficiency, regression analysis, sequential analysis, statistical decision theory, nonparametric inference. *Prerequisites: advanced calculus and consent of instructor.*

282A-B-C. Applied Statistics (4-4-4)

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.) (F,W,S) (Not offered in 1980-81.)

284A-B-C. Applied Probability (4-4-4)

Random variables, random number generation, distribution functions, Markov chains, Poisson processes, Brownian motion, branching and queueing processes, stationary processes, Fourier analysis, and related topics. *Prerequisites: Math. 140C or equivalent.* (Not offered in 1980-81.)

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 data, bioassay, counts, regression and correlation, analysis of variance, survivorship. Some emphasis will be given to computational techniques. *Prerequisite: consent of the instructor.* (This course offered only through School of Medicine.) (W) (Not offered in 1980-81.)

287A-B-C. Topics in Probability and Statistics (3-3-3)

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. *Prerequisite: consent of instructor.* (S) (Not offered in 1980-81.)

288. Seminar in Probability and Statistics (1 to 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

290A-B-C. Topology (3-3-3)

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 3)

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 (3-3-3)

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 3)

Prerequisite: consent of instructor. (S/U grades permitted.)

299. Reading and Research (1 to 9)

Independent study and research for the doctoral dissertation. One to three credits will be given for independent study (reading) and one to nine for research. *Prerequisite: consent of instructor.* (S/U grades permitted.)

Teaching of Mathematics

500. Apprentice Teaching (1 to 3)

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.)

MUIR COLLEGE

OFFICE: Provost, Muir College
2126 Humanities and Social Sciences
Building

Courses

199. Muir Special Project (4-16)

A course of independent work on a research or creative project to satisfy a Muir graduation requirement. (Only Muir students who have had Muir Special Project proposals approved may enroll in this course.) Students wishing to enroll must submit a written request with a description of the project. (Muir students must submit the Muir Special Project 199 form to the major adviser and to the Office of the Provost by the seventh week of the quarter prior to the quarter in which the 199 is to be undertaken. For information on other requirements, consult the provost's office.) *Prerequisites: upper division status, approval by project adviser and by provost.* (Letter grades only.)

The Writing Program

The Muir College Writing Program provides courses by which students may meet the Muir College graduation requirement that they demonstrate an ability to write English according to standards appropriate for all college work.

Through practice in writing narrative, expository and argumentative papers, Muir Writing 10 emphasizes the development of fluency, voice, and confidence, as well as mastery of skills necessary for coherent writing. In the small workshop

Music

classes students get individual help with their writing from tutors. Muir Writing 20 is an advanced college writing course which concentrates on analytical and argumentative writing. Students are expected to be able to express complex ideas clearly, to write at a level of sophistication comparable to that required in other college courses, and in general to demonstrate mastery and control of the language. Sections vary in theme and content, giving students the opportunity of writing in areas that interest them or may be relevant to their major field. (Descriptions of the Muir 20 sections are available each quarter in the Muir Writing Program office during preregistration.) Classes are small, and the dominant modes of instruction are peer critique and individual tutorial.

Upon entry, students are placed in Muir 10 or Muir 20 according to their level of writing skills as determined by scores on the English Composition Test of the CEEB. A freshman who completes Muir 10 will normally take Muir 20 in the sophomore year, but can take it in the freshman year with the instructor's permission. In cases where more than one quarter of practice is needed to prepare a student for Muir 20, an IP grade is given, and the student takes Muir 11.

In keeping with the Muir College philosophy of allowing students choices in fulfilling college requirements, in addition to Muir 10 and 20, the Writing Program provides an alternative way of satisfying the Muir College writing requirement. Those who feel that their writing ability already equals the Muir College graduation requirement will be permitted to demonstrate this ability by examination. The Advanced Writing Examination is given in the third week of each quarter.

Courses

10. College Writing (4)

A workshop course focusing on students' discovery of what they want to say and how they might say it effectively in writing. Students will write both personal and academic essays, developing skills through weekly writing and revision, group critiques, and individual conference.

11. Special Study in Composition (4)

An individualized writing class which includes class discussions and peer critiques but emphasizes tutorials. Students confer individually with instructors on a regular weekly basis to talk out writing plans, go over drafts, and work on specific mechanical problems. This course is designed for students who have taken Muir 10 or its equivalent but need additional writing practice to prepare for Muir 20. Muir 11 does not satisfy the first part of the Muir writing requirement. *Prerequisites:* Muir 10 (Passing grade or IP) or its equivalent and consent of the instructor.

20. Advanced College Writing (4)

A workshop course in skills necessary for advanced college writing: critical thinking, logical organization, intelligent use of sources and effective style. Students will gain experience in

informative, analytical, and argumentative writing by frequent practice, feedback, and revision. *Prerequisite:* satisfaction of Muir 10 or its equivalent.

30. Creative Writing (4)

An elective course in which students can experiment with different modes of creative writing. Weekly presentation and critiques of work in progress. This course does not satisfy the Muir writing requirement. *Prerequisite:* consent of the instructor.

MUSIC

OFFICE: 110 Mandeville Center for the Arts

Professors:

†Robert Erickson, M.A.
Peter Farrell, M.M.
Thomas Nee, M.A.
János Négyesy, Dip. Mus.
Wilbur Ogdon, Ph.D.
‡Pauline Oliveros, B.A.
Bernard Rands, M.M.
Roger Reynolds, M.M. (*Chairman*)
John Silber, Ph.D.
Bertram Turetzky, M.A.

Associate Professor:

Jean Charles Francois, 1^{er} Prix

Assistant Professors:

*Gerald Balzano, Ph.D.
‡Edwin Harkins, Ph.D.
Cecil Lytle, B.A.
Carol Plantamura, M.F.A.

†On leave winter, spring 1981

‡On leave fall 1980

*On leave spring 1981

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.

The Undergraduate Program

The special characteristic of the undergraduate program in music at UC San Diego 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 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 3A-B-C); and those that introduce students to the traditional musical heritage of our culture (Music 6)*. 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 3A-B-C) and Music 22A-B-C (instead of 6) are essential.

Particular major or minor requirements and course prerequisites may be waived by examination for students with sufficient background in music.

*Music 5 and 6 may be offered more than once a year, and may be repeated for credit with consent of instructor.

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 or Music 130 ensemble performance for at least six quarters. (Transfer students will be credited for corresponding activities at other institutions.) Appropriate credit towards graduation will be given for study in any performance course beyond the required six quarters.

Two undergraduate major programs in music are offered at UC San Diego. 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 UC San Diego must devote considerable time to attaining them, either in lower-division courses or in independent study. For that reason, this program is suited for students in Muir, Third, and Warren College whose college requirements permit considerable specialization in the lower division; however, Revelle College students with extensive training in music

prior to entrance at UC San Diego 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 UC San Diego nor extensive, time-consuming training in musicianship skills, it fits the special needs of students in Revelle College, although it is open also to students in Muir College, Third 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 (P) or better.

The Music Major Program

The lower-division requirements for this major are Music 5 (one quarter), Music 2A-B-C, Music 20A-B-C, and Music 22A-B-C. For students in this program Music 5 and 2A may be taken concurrently. To complete the major requirements the following courses are required:

1. Music 101A-B-C.
2. Music 102A-B-C (normally taken in the senior year).
3. Two quarters of Music 133 (normally taken in the winter quarters of the junior and senior years).
4. Music 111 or Music 114.
5. Music 103A-B-C (composition), or Music 105, 106, 107 (music technology and psychoacoustics), or Music 132A-B-C (performance), or three additional courses from the series Music 111-125 (literature).
6. Six quarters of Music 95 or 130.
7. Music 143 every quarter.

Honors

The requirements for a B.A. degree with Honors in Music are the same as for the music major program, but with additional specification that twelve unit credits be taken in courses in advanced performance, specifically in Music 132D-E-F, or in composition, specifically in Music 103D-E-F. 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.

The Music/Humanities Major Program

The lower-division requirements for this major are a total of four courses: Music 4, 5, 6, 7, or Music 4 with any combination of Music 5 or 6 repeated. In addition, twelve upper-division courses are required to satisfy the major requirements, of which six must be music literature courses (Music 111-125); 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 visual arts 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 or 130 is required. Continuous enrollment in Music 143 (department seminar) is also required.

MINOR PROGRAMS

To satisfy the non-contiguous minor requirements for Revelle College or the optional minor requirements for 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, 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. The Department of Music offers many of its courses as elements which it is possible to combine for a minor program. All combinations meeting the above conditions will be considered. However, students should seek advice and obtain approval from their departmental adviser prior to embarking upon a minor program.

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:

- a. Tapes demonstrating their level of vocal/instrumental performance. It is expected that applicants will be acceptably proficient in one area of performance skills.
- b. A repertory list of works performed during the past year and a sample of printed concert programs in which they have participated.
- c. A minimum of two papers illustrating ability in any one of the following: analysis, criticism, aesthetics or music technology.
- d. Where applicable, a minimum of two scores of instrumental works with tapes of these (and also of electronic compositions, if desired).
- e. 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.

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) 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 candidacy until all deficiencies are remedied.** The appropriate departmental adviser or the student's individual adviser must approve student course programs each quarter prior to registration for classes, as well as any significant change in those programs.

MASTER'S DEGREE PROGRAM

The department offers work leading to a Master of Arts in Music with emphasis on composition, performance, or theoretical studies. The degree requires completion of at least thirty-six quarter units of graduate courses (courses numbered

200-299), 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 201A-B**, Projects in New Music Performance for both years of their residence at UC San Diego. 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 are to enroll in **Music 200** and to pass an examination in the modern technology of music by the end of their first quarter at UC San Diego. Students with extensive background in analog/digital studio operation will be assigned to appropriate courses in order to satisfy the Music 200 requirement. In addition, all M.A. students are required to take **Music 210**, Musical Analysis and **Music 218**, Topics in Performance Practices 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 sequence Music 203A-B-C-D and two courses in theoretical or experimental studies. Students emphasizing performance must take the performance sequence 232A-B-C-D and two courses in music literature or performance practices.

Students who wish to emphasize **theoretical studies** in their M.A. programs must first gain proficiency in either composition or performance by satisfactorily (grade of B or better) completing, in their first year, either the composition sequence Music 203A-B-C or the performance sequence Music 232A-B-C; in addition, they must take two courses in theoretical (207's), and one course in experimental studies (206's).

Students who wish to emphasize **technology** should request detailed information from the department chairman.

To supplement their course programs (a full-time graduate student is required to carry nine to 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**. Finally, all graduate students must enroll in the department seminar (Music 143) every quarter.

Typical Programs for the M.A. in Music

FALL	WINTER	SPRING
First Year		
<i>Composition Emphasis</i>		
203A	203B	203C
200		218
201A	201B	
	210	
*Other	*Other	*Other
Second Year		
203D	299	299
206/207	207/206	
201A	201B	
291		
*Other	*Other	*Other
First Year		
<i>Performance Emphasis</i>		
232A	232B	232C
200		218
201A	201B	
	210	
*Other	*Other	*Other
Second Year		
232D	299	299
Lit-Perf	Lit-Perf	
Prac	Prac	
201A	201B	
291		
*Other	*Other	*Other
First Year		
<i>Theoretical Studies Emphasis</i>		
Same as for Composition or Performance Emphasis		
Second Year		
206	299	299
207	207	
201A	201B	
291		
*Other	*Other	*Other

*Other courses and activities will include electives, Music 500, departmental colloquia and concerts.

Master's Thesis

M.A. candidates will present a thesis consisting of two parts:

1. A folio of three research papers — normally to be written in connection with the courses the student will be taking.

2. Under supervision of the student's graduate adviser in Music 299:
 - a. Candidates emphasizing composition will prepare a folio of three chamber compositions together with tape recordings of them.
 - b. Candidates emphasizing performance will present a lecture recital lasting an hour — the program to be approved by the departmental master's degree adviser.
 - c. Candidates emphasizing theoretical studies will write an extended research paper on a topic chosen with their adviser.

The specific nature of Part 2 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, and the topic of the extended research paper for theoretical studies emphasis — 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 of both parts.

DOCTORAL DEGREE PROGRAM

Students of superior musical competence may pursue a program with emphasis in composition or in theoretical/experimental studies leading to the Ph.D. in music, under the general requirements for the Doctor of Philosophy degree as described in the section "Graduate Studies" of this catalog. The specific departmental requirements for the degree are:

1. Successful completion of 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 291 and Music 200 must be taken in the first quarter of the Ph.D. program if proficiency cannot be demonstrated. Music 201A-B must also be taken twice if the student has not participated in UC San Diego's master's degree program.)
2. A minimum of eight doctoral level courses beyond the M.A. which are approved in consultation with the student's committee. Ph.D. students are expected to take two of three 209-level seminars during each of their first two years, and these four courses will be counted towards the required eight.

3. a. One research paper adjudged to be of publishable quality, to be completed prior to qualifying examinations.
- b. For students taking a composition emphasis, an additional folio of not less than three compositions (not previously accepted for an M.A. degree) to be completed prior to qualifying examinations.
4. Demonstration through written and oral examinations of a comprehensive understanding of literature and theory of the field.
5. An acceptable dissertation (theoretical/experimental studies) or a major composition project (composition studies).
6. A final public defense of the dissertation/composition.
7. Six units of credit in Music 500.
8. Music 143 every quarter.

Materials previously submitted for other degrees are not acceptable for submission for the Ph.D. degree.

The required eight 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 eight 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.

Typical Program for the Ph.D. in Music First and Second Years

Same as for M.A. program in Music**

Third and Fourth Years

Eight approved courses and a publishable paper (plus 200, 201A-B twice, and 291 if required).**

Additional courses for breadth.

Six units of Music 500.

Written and oral qualifying examination.

Fifth Year

Dissertation writing.

Dissertation defense.

**cf. above under 1

Courses

Lower Division

2A-B-C. Basic Musicianship (4-4-4)

The development of basic skills necessary to musicians. Perception and notation of pitch relationships, temporal relationships, and musical structures. Extensive drills in sight-singing, rhythmic reading, and dictation. 2A-B-C will satisfy Third College year sequence in fine arts. *Prerequisites: must be taken in sequence; for music majors only or by consent of instructor*

3A-B-C. Musical Literacy (4-4-4)

Primarily a course to develop listening 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. Primarily intended for non-majors. 3A-B-C will satisfy Muir College and Third College year sequence in fine arts.

4. An Introduction to Music/The Elements of 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.

5. The Nature of Music Through Participation (4)

A one-quarter experience designed to discover and expand musical potential. 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 provided instruments.

6. A Critical Approach to Musical Masterworks (4)

The course will consist of lectures and listening sections devoted to a detailed discussion of a small number of recognized masterworks (e.g., Mozart, Beethoven, Berlioz, etc.).

7. Music, Science, and Computers (4)

Impacts of past and present music, science, and technology upon one another, including how mechanical, electrical, and digital technology has affected the materials, uses, and prospects of music. Basic principles and future horizons will be emphasized.

20A-B-C. Music Theory and Practice I (4-4-4)

An integrated and creative approach to the study of materials of music through hearing, writing, analyzing, and performing. Continues ear training. Studies in melodic writing and counterpoint. *Prerequisites: Music 1A and Music 2A-B-C (Students who have taken Music 2C prior to fall 1978 must also take a qualifying examination in order to be admitted to Music 20.) (F,W,S)*

22A-B-C. Laboratory Survey of Music Literature (4-4-4)

Study of music literature for music majors through lectures and laboratory sessions. Occasional readings, papers, and reports (F,W,S)

32. Instrumental/Vocal Instruction (2)

Supervised study of instrument or voice. The final grade is determined according to the student's progress through the course, as judged by the course coordinator. For music majors

95. Ensemble Performance (2)

Participation in music 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. Chamber Music Performance

Section C. Concert Choir

Section D. Symphonic Chorus

Section E. Chamber Orchestra

Section F. Collegium Musicum

Section G. Gospel Choir

Section H. Chamber Opera

Section I. Music Theater

Section J. Jazz Ensemble

Section K. Chamber Singers

Section L. Wind Ensemble

Section M. Madrigal Singers

Section N. Non-Western Music

Upper Division

101A-B-C. Music Theory and Practice II (4-4-4)

A study of the structure of homophonic tonal music. Representative examples of music literature are studied for an understanding of pitch relationships, temporal relationships, form, pattern, etc. Class time is devoted to hearing, singing, analysis and writing. Individual drills in aural comprehension are provided in the Central University Library. *Prerequisites: Music 2A-B-C. (Students who have taken Music 2C prior to fall 1978 must also pass a qualifying examination in order to be admitted to Music 101.)*

102A-B-C. Music Theory and Practice III (4-4-4)

Advanced study of the materials of music. Wagner through Cage. Aural discrimination, analysis, exercises, short compositions. *Prerequisites: Music 20A-B-C; Music 101A-B-C (F,W,S)*

103A-B-C-D-E-F. Seminar in Composition (4-4-4-4-4-4)

Individual projects in composition critically reviewed in seminar with fellow student and faculty composers. *Prerequisites: Music 20A-B-C; Music 103A-B-C for D-E-F, or consent of instructor (F,W,S)*

104. Sound Sources and Receivers (4)

An introduction to the physical properties associated with the production, transmission and reception of sound as musical events. Open to music majors only. *Prerequisite: consent of instructor.*

105. Electronics in Music (4)

Seminars in theoretical and applied research in the generation and processing of electronic sound for composition and performance. *Prerequisites: Music 104 and consent of instructor*

106. 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.*

107. Fundamentals of Computer Music (4)

Techniques of digital sound synthesis and their implications for composition. *Prerequisites: Music 105 and Music 106*

111. World Music (4)

A course of illustrated lectures giving an introduction to and brief summary of selected musics of the world

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. Since the selected literature will vary from year to year, the course can be repeated for elective credit. Music majors are assigned additional projects. *Prerequisites: Music 11A B C or Music 22A B C or consent of instructor. (Not offered in 1980-81)*

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: Music 11A B C or Music 22A B C or consent of instructor. (Not offered in 1980-81)*

Music

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 for credit. *Prerequisites:* Music 11A-B-C or Music 22A-B-C or consent of instructor. (Not offered in 1980-81.)

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:* Music 11A-B-C or Music 22A-B-C or consent of instructor. (Not offered in 1980-81.)

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:* Music 11A-B-C or Music 22A-B-C or consent of instructor.

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:* Music 11A-B-C or Music 22A-B-C or consent of instructor. (Not offered in 1980-81.)

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:* Music 11A-B-C or Music 22A-B-C or consent of instructor.

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 11A-B-C or Music 22A-B-C or consent of instructor. (Not offered in 1980-81.)

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. The course can be repeated for elective credit. Music majors are assigned additional projects. *Prerequisites:* Music 11A-B-C or Music 22A-B-C or consent of instructor. (Not offered in 1980-81.)

125A-B-C. Black Music in America (4-4-4)

A sequence of three courses entailing a topical study of the music produced by Black Americans. In each section of this course sequence, particular attention will be placed on the political, social and economic developments in America as they affect and are affected by, the evolution of Black music.

128. Principles and Practice of Conducting (4)

The theory and practice of conducting as related to the study of instrumental and choral literature. *Prerequisite:* consent of instructor.

130A-B-C. Seminar in Chamber Music Performance (2-2-2)

Performance of representative instrumental and vocal chamber music literature. *Prerequisite:* consent of instructor through audition. (FWS)

132A-B-C-D-E-F. Pro-Seminar in Music Performance (4-4-4-4-4)

Individual or master class instruction in advanced instrumental/vocal performance. May be repeated for credit. *Prerequisite:* consent of instructor through audition. Preference given to music majors.

133. Projects in New Music Performance (2)

Performance of new music of the twentieth century. Normally offered winter quarter only. *Prerequisite:* consent of instructor through audition.

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.

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 coursework. *Prerequisites:* consent of instructor and departmental approval.

Graduate

200. Music Technology (2)

A first course in the uses of electronic technology. Operation of UC San Diego analog electronic studios. Sound generation and manipulation. Microphones. Stereo recording technique. Dubbing, mixing, filtering, and splicing. Basic digital sound generating. Practical and creative uses of electronic technology.

201A-B. Projects in New Music Performance (1-1)

Performance of new music of the twentieth century. All graduate music students must enroll in fall and winter quarters.

202. Live Electronic Performance (3)

Problems and projects in the specialized use of electronics in performance. *Prerequisites:* Music 200 and consent of instructor. (Not offered in 1980-81.)

203A-B-C-D. Advanced Projects in Composition (3-3-3-3)

Meetings and laboratory sessions devoted to the study of composition.

205. Advanced Use of Electronics in Music (3)

Seminars in advanced theoretical and applied research in the generation and processing of electronic sound for composition and performance. *Prerequisites:* Music 200 and consent of instructor.

206. Experimental Studies Seminar (3)

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 (3)

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 (3)

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 (3)

The analysis of complex music. The course will assume that the student has a background in traditional musical 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.

212. Seminar in Vocal and Choral Literature (3)

A critical and historical study of selected works and repertory.

213. Opera Studies (3)

A detailed analytical study of selected operas in production in San Diego, Los Angeles, or San Francisco. *Prerequisite:* consent of instructor. (Not offered in 1980-81.)

214. Seminar in Twentieth-Century Music (3)

Detailed study of selected literature through the study of scores and writings, supplemented when possible by performance participation.

215. Seminar in Bach and Related Studies (3)

A study of content and structure in selected compositions of J. S. Bach. *Prerequisite:* consent of instructor. (Not offered in 1980-81.)

216. Seminar Studies in Late Medieval and Early Renaissance Music (3)

Problems of style and performance in selected music of the thirteenth, fourteenth, and fifteenth centuries. (Not offered in 1980-81.)

217. Seminar Studies in Late Renaissance and Early Baroque Music (3)

The study of early music as it has to do with theoretical systems, critical analyses, music and documentary source materials.

218. Contemporary Performance Practices

Selected aspects of performance practice of the twentieth century will be studied: realization of graphic scores, extended techniques, performance of post-Webern music, etc.

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 1980-81.)

224. Seminar Studies in Chamber Literature (3)

A critical and historical study of selected works and repertory.

228. Conducting (3)

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. *Prerequisite:* consent of instructor.

230. Advanced Seminar in Performance of Music for Small Ensemble (3)

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.

232A-B-C-D. Pro-Seminar in Music Performance (3-3-3-3)

Individual or master class instruction in advanced instrumental/vocal performance. *Prerequisite:* consent of instructor through audition.

236. Chamber Orchestra (3)

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 1980-81.)

237. Opera Studio (3)

Study and performance of scenes from standard, classic operas, experimental music theatre and chamber operas. *Prerequisite:* consent of instructor through audition. (Not offered in 1980-81.)

291. Problems and Methods of Music Research and Performance (3)

The course will give practical experience in historical research including use of important source materials, evaluation of editions and examination of performance practice problems.

296. Directed Research (1-3)

Individual research. (S/U grades permitted.) May be repeated for credit.

298. Special Studies (1)

Concentrated inquiry into various problems, e.g. problems in string notation for composers; problems in sight singing; problems in analysis. *Prerequisite:* consent of instructor.

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. (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.

NATURAL SCIENCES

OFFICE: Provost, Revelle College

This section applies only to continuing and/or returning students. There are now more options available for Revelle students to meet their natural science requirement. In addition to the courses listed below, **Chemistry 6A-B-C** can also be taken in lieu of **Natural Science 2D-F**. Also, **Physics 3A-B-C-D** is still available for honor students. A revision of natural science course offerings has resulted in the following renumbering of all natural science courses:

Chemistry, Old Courses:

Natural Science 1A-B
Natural Science 2D-F
Natural Science 2DL-FL

To be replaced by:

New Courses:

Chemistry 5A-B
Chemistry 7A-B
Chemistry 8AL-BL

Physics, Old Courses:

Natural Science 1D-E
Natural Science 1DL-EL*
Natural Science 2A-B-C†
Natural Science 2CL†

To be replaced by:

New Courses:

Physics 1A-B-C
Physics 1BL-CL**
Physics 2A-B-C-D
Physics 2CL-DL

Biology: Old Courses:

Natural Science 1C
Natural Science 2E

To be replaced by:

New Courses:

Biology 1
Biology 1

†Natural Science 2C-CL

will be offered fall, 1980 so that students may complete the sequence

*Included lecture combined with lab

**Now separates lab and lecture

Detailed descriptions of these courses and their prerequisites can be found under "Courses, Curricula, and Programs of Instruction: Chemistry, Physics, and Biology." The Revelle College general-education requirements remain unchanged as "five courses in the physical

and biological sciences to include four quarters of physics and chemistry, and one quarter of biology."

Students are advised to check carefully preparation for the major and to read the descriptions and prerequisites of these new courses. Continuing students who have questions concerning programs in which to continue should see a college academic adviser.

NEUROSCIENCES

OFFICE: 3034 Basic Science Building,
School of Medicine

Professors:

Samuel H. Barondes, M.D. (*Psychiatry*)
Reginald G. Bickford, M.D.
Floyd E. Bloom, Ph.D. (*Behavioral Neurobiology*)
Theodore H. Bullock, Ph.D.
J. Anthony Deutsch, D. Phil. (*Psychology*)
John W. Evans, M.D., Ph.D. (*Mathematics*)
Edmund J. Fantino, Ph.D. (*Psychology*)
Earl R. Feringa, M.D. (*Adjunct, Neurology*)
Robert Galambos, M.D., Ph.D. (*Director of Graduate Studies*)
David S. Janowsky, M.D. (*Psychiatry*)
Robert B. Livingston, M.D.
Arnold J. Mandell, M.D. (*Psychiatry*)
John S. O'Brien, M.D.
George S. Reynolds, Ph.D. (*Psychology*)
David S. Segal, Ph.D.
Charles E. Spooner, Ph.D.
Robert Tschirgi, M.D., Ph.D.
Silvio Varon, M.D. (*Biology*)
Wigbert C. Wiederholt, M.D. (*Chairman of the Group*)
Samuel S. C. Yen, M.D. (*Reproductive Medicine*)

Associate Professors:

Walter F. Heiligenberg, Ph.D. (*Behavioral Physiology, SIO*)
Steven A. Hillyard, Ph.D.
G. David Lange, Ph.D.
Maurice S. Montal, M.D., Ph.D. (*Biology & Physics*)
Morton P. Printz, Ph.D. (*Medicine*)
Allen I. Selverston, Ph.D. (*Biology*)
Marjorie Seybold, M.D.
Palmer W. Taylor, Ph.D. (*Medicine*)
Juan Yguerabide, Ph.D. (*Biology*)

Assistant Professors:

Jack A. Alhadeff, Ph.D.
Darwin K. Berg, Ph.D. (*Biology*)
Eric Courchesne, Ph.D.
Ian Creese, Ph.D.
Vincent E. Dionne, Ph.D. (*Medicine*)

Mark Ellisman, Ph.D.
Charles K. Jablecki, M.D.
William B. Kristan Jr., Ph.D. (*Biology*)
E. Roger Marchand, Ph.D. (*Adjunct*)
Arnold L. Miller, Ph.D.
Robert R. Myers, Ph.D. (*Anesthesiology*)
Frank R. Sharp, Ph.D.
Nicholas Spitzer, Ph.D. (*Biology*)
Larry Squire, Ph.D. (*Psychology*)
Paula A. Tallal, Ph.D. (*Psychiatry*)
Doris A. Trauner, M.D. (*Pediatrics*)

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 a faculty committee, selects courses relevant to his or her interests and goals which also provide a solid grounding in the several disciplines of pre-clinical 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.

Dissertation

During the second year students are expected to propose and initiate work on a thesis problem under the guidance of a faculty preceptor. The neurosciences group at UC San Diego presently conducts animal research and clinical studies in the fields of neuroanatomy, neurochemistry, neuropharmacology,

Natural Sciences

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.

Examinations

Written examinations on the material covered in formal courses are required. Frequent oral and written exercises and defense of propositions in laboratory and seminar settings can be expected; the aim is to sharpen student skills in the presentation of scientific material. An oral examination to qualify for candidacy for the Ph.D. degree is ordinarily taken at the end of the second year. An oral defense of the thesis is the final examination requirement.

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.

Courses

Undergraduate

198. Directed Group Study (2-4)

Directed group studies in areas not presently offered by the department (P/NP grades only.) *Prerequisite:* permission of department (F,W,S)

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

223. Quantitative Theories of Nervous-System Function (3)

Lectures on linear and non-linear interactive models and linear and non-linear system identification techniques as applied to neurophysiology. *Prerequisite:* consent of instructor. (S/U grades only.) (S)

227. Neurosciences Concepts (1)

Analytical, critical, and creative discussions of neurosciences phenomena and concepts. Entire quarter is devoted to one problem area, e.g. brain mechanisms involved in perception, memory, visceral regulation, development, etc., with attempt to establish improved theoretical and experimental approaches. (S/U grades only.) (W)

228. Physiological Basis of Audition (2)

Based on examinations of the recent literature, lectures and student reports will cover the physiological correlates of pitch, loudness, localization, and other aspects of hearing. *Prerequisite:* consent of instructor. (S/U grades only.) (S)

230. Neurosciences Graduate Seminar (1)

Weekly seminars by students of the neurosciences graduate group on topics of recent advances in the neurosciences. *Prerequisite:* student status in the neurosciences graduate group. (S/U grades only.) (F,W,S)

233. Comparative Neurology (4)

Survey of structure and function of nervous systems of invertebrates and vertebrates. Two hours' lectures, three hours' laboratory, and two hours' discussion. *Prerequisite:* neurobiology or basic neurology, physiological psychology, or other introduction to the nervous system. (S/U grades only.) (F)

234. Neurochemistry (4)

A survey of the chemistry, metabolism, and pharmacology of the nervous system. *Prerequisite:* undergraduate biochemistry. (S/U grades permitted.) (S)

238. Systems Neurophysiology and Functional Neuroanatomy (3-12)

Advanced study of the structure and function of nervous systems especially of mammals and other vertebrates: four hours of lectures, four hours of special presentations by faculty of the Neurosciences Group, four, four-hour laboratories and six hours of individually-directed library research work per week. *Prerequisite:* graduate standing in the neurosciences doctoral program or consent of instructor, enrollment limited. (S/U grades only.) (F)

242A. Mathematics in Biology (3)

Matrices and the eigenvalue problem as applied to theoretical ecology. Phase plane techniques in the study of nonlinear differential equations of the Lotka Volterra type. *Prerequisite:* calculus. (F)

242B. Mathematics in Biology (3)

Multivariate analysis. Multivariate hypothesis test and the theory and use of principle components, fact and canonical correlation analyses. *Prerequisites:* calculus and equivalent of elementary statistics and 242A. (W)

242C. Mathematics in Biology (3)

Fourier and Laplace transforms. *Prerequisites:* calculus and equivalent of 242A. (S)

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)

244. EEG Clinical Seminars (1)

Presentation of interesting case histories of EEG patients and EEG's recorded in the previous week. Study of movies of seizure patients, integration of EEG findings with behavior. Review of research projects in clinical neurology, depth recording, computer techniques in automation of EEG. (S/U grades only.) (F)

245. EEG Research Seminars (1)

Presentation of research topics by students and staff. Research projects are discussed in the phase of design and after completion. In addition to research, students are assigned topics for essays and discussion. Emphasis will be on EEG analysis and computer techniques. (S/U grades only.) (F)

247. Fundamentals of Neuro-Ophthalmology (1)

Anatomy and physiology of the visual and ocular motility systems will be examined. Disorders of these systems will be discussed with emphasis on localizing abnormally by understanding normal function. *Prerequisite:* medical graduates; neurosciences graduate students, or consent of instructor. (S/U grades only.) (W)

249. History of Medicine (1)

The course examines the causes of conceptual progress and advances in medicine as well as the historical relations between medicine and society. (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 current research into human information processing with emphasis on electrophysiological changes during attention to, and perception and comprehension of visual, auditory and somatic stimuli. *Prerequisite:* consent of instructor. (S/U grades only.) (F,W,S)

253. Clinical Neuroanatomy (1)

Review of neuroanatomy with emphasis on clinical correlations. Pertinent physiological, chemical and clinical information will be included, and functional organization will be stressed. It is essential that students be familiar with neuroanatomical nomenclature. *Prerequisite:* medical student, graduate student, intern, resident or consent of instructor. (S/U grades permitted.) (F)

254. Glycoproteins (2)

This course will consider the biosynthesis, structure and possible functions of glycoproteins with particular emphasis on brain specific glycoproteins. The course will proceed by critical reading and discussion of the current literature by class participants. *Prerequisite:* general biochemistry or equivalent or consent of instructor. (S/U grades permitted.) (F)

255. Neurochemistry Seminar (1)

Course will entail student presentations, discussion, and critical evaluation of current research papers in the various disciplines of neurochemistry. (S/U grades only.) (F,W,S)

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 permitted.) (W)

258. Fundamentals of Cerebral Circulation Metabolism (1)

Structure/function of the cerebral circulation will be presented with emphasis placed on the microcirculatory basis of clinical phenomena. Normal and pathophysiologic perturbations in the couple between metabolism and blood flow will be explored. Specialized research techniques will be demonstrated. *Prerequisite:* Basic Neurology, Neuro. 238 or consent of instructor. (S/U grades only.) (W)

259. Workshop in Electron Microscopy (4)

This course is to introduce graduate students in the neurosciences to research methods used in electron microscopy (EM) through one hour of formal lecture, one hour of seminar, three hours of demonstration, and three hours of supervised laboratory work per week. Students will become familiar with thin sectioning EM, scanning EM and freeze-fracture EM. *Prerequisite:* graduate student standing in neurosciences doctoral program and consent of instructor. Enrollment limited to six students. (S/U grades permitted.) (S)

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.) (S)

261. Electric Fields in the Brain and EEG (3)

Designed to provide neuroscience and medical students with a basic understanding of electric field transmission through living tissue and to show the applicability of these ideas to practical problems in EEG. *Prerequisite:* consent of instructor. (S/U grades only.) (S)

262. Neurophysiology (5)

One quarter core course especially for graduate students in neuroscience. Lectures and readings in texts and journals, on membrane, cellular and systems physiology of invertebrates and vertebrates, central and peripheral nervous systems. Discussions and demonstrations. *Prerequisite:* medical class or neurosciences or physiology-pharmacology or biology. (S/U grades only.) (W)

263. Advanced Cellular Neurobiology (3)

Cellular and developmental aspects of the nervous system. Methods of investigation and culture approaches. Basic neuroembryology and selected examples of regional developments. Neuroglial cells and neuron-glia interactions. Ex-

intrinsic 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)

265. 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)

266. Aggression: Neurobiology and Behavior (1)

This seminar will survey the literature on aggressive behavior in man and animals. Behavioral and neurobiological perspectives will be emphasized. *Prerequisite: graduate and medical students. Undergraduates with instructor's permission.* (S/U grades only.)

267. Recent Advances in CNS Neurotransmitter & Drug Receptors (2)

Course will review recent advances in CNS neurotransmitter and drug receptors as studied by radioligand binding techniques. Basic principles and techniques and their limitations will be initially emphasized. Receptors to be discussed in detail will include opiate/endorphin, GABA, benzodiazepine, serotonin, dopamine, adrenergic, histamine, cholinergic, CNS-active peptides, glycine and glutamate. The role of receptor disturbances in the etiology of CNS diseases such as schizophrenia and depression will be discussed. *Prerequisite: graduate status or consent of instructor.* (S/U grades only.)

268. Molecular and Cellular Neuroanatomy (3)

An examination of nervous systems, emphasizing dynamic properties of cells. The dynamic aspects of cell systems and organelles responsible for cell form, cellular movements, functional membrane asymmetry, protein synthesis, packaging of materials for export, neuroplasmic transport, ionic equilibria and energy metabolism as well as membrane molecular organization of interactions at cellular junctions will be considered. *Prerequisites: neurochemistry, neuroanatomy, biochemistry* (S/U grades only.)

296. Neurosciences Independent Research (1-12)

Independent study. (S/U grades only.) (F,W,S)

299. Neurosciences Thesis 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*

402. Clinical Neurology Clerkship-Advanced (7 or 14)

This is a continuation of Neurosciences 401 for students interested in a more advanced clinical neurology experience. It is a full-time inpatient and out-patient experience. This a four-week course offered continuously throughout the year. *Prerequisites: Neurosci. 401 and consent of instructor.* (S/U grades only.)

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 anytime during their subsequent years of training. The amount of teaching required is equivalent to the duties expected of a 50 percent teaching assistant for one quarter. *Prerequisite: neurosciences graduate students* (S/U grades only.) (F,W,S)

PHILOSOPHY

OFFICE: 3112 Humanities Library Building, Revelle College

Professors:

Henry E. Allison, Ph.D. (*Chairman*)
Sige-Yuki Kuroda, Ph.D. (*Adjunct Professor*)

Edward N. Lee, Ph.D.

Stanley W. Moore, Ph.D. (*Professor Emeritus*)

Frederick A. Olafson, Ph.D.

Avrum Stroll, Ph.D.

Zeno Vendler, Ph.D.

Associate Professors:

Georgios H. Anagnostopoulos, Ph.D. (*Graduate Adviser*)

Gerald D. Doppelt, Ph.D.

Assistant Professors:

Richard J. Arneson, Ph.D.

S. Nicholas Jolley, Ph.D.

(*Undergraduate Adviser*)

Robert B. Pippin, Ph.D.

Mark L. Wilson, Ph.D.

Barbara A. Winters, Ph.D.

Acting Assistant Professor:

Paolo M. Dau, M.A.

The Undergraduate Program

Students who wish to major in philosophy are advised to undertake introductory work in philosophy before attempting to satisfy the requirements given below. The introductory sequences Philosophy 13, 14 and 15, and Philosophy 23, 24 and 25 are especially useful.

The following courses are required of philosophy majors:

1. Philosophy 31, 32, 33 (History of Philosophy).
2. Twelve upper-division courses in philosophy. These will include Philosophy 110 (Symbolic Logic I) and at least three additional courses in the History of Philosophy to be selected from the series Philosophy 101-107. With the approval of the undergraduate adviser, up to two upper-division courses from outside the Department of Philosophy but in fields of study that are closely related to the student's philosophical interests may be used to count toward satisfaction of this requirement.

Special and independent studies courses (including courses numbered 199) may not be used to satisfy major requirements, nor may Philosophy 180 be used to satisfy major requirements.

Courses taken at another institution may be used in satisfaction of major requirements, with the approval of the department. Major requirements may be met by examination. It is required that a passing grade and an overall average of 2.0 must be obtained in courses taken at UC San Diego fulfilling the major requirements before certification of completion will be granted. Major requirements are not fulfilled by courses in which a grade of D is obtained.

Undergraduate courses offered by the Department of Philosophy enable students to satisfy the humanities requirement of Third College's general education requirement under Program B.

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

An M.A. is offered under the Preliminary Examination Plan. Under this plan, credit must be obtained for thirty-six quarter units; at least fourteen units must be from graduate courses in philosophy; no more than nine units may be from upper-division courses. In addition, a written examination must be passed prior to the conclusion of the seventh quarter in residence. This examination is identical to the written examination required of Ph.D. candidates.

Candidates for an M.A. degree must demonstrate reading proficiency in one foreign language (Classical Greek, Latin, French, or German).

DOCTORAL DEGREE PROGRAM

During the first two years of residence the student will be expected to take in each year at least twelve units in graduate philosophy courses (specifically, those numbered 201-295). The balance

Philosophy

of the student's course work, which will normally total thirty-six units per year, may be made up from upper-division courses in philosophy, upper-division and graduate courses in other departments and, if the student is a teaching assistant, Philosophy 500.

By their seventh quarter of residence, all students must pass a preliminary examination consisting of the following three parts:

- a. metaphysics
- b. epistemology
- c. ethics

The exam in all of its parts has a strongly historical character. Questions will be based on a departmental reading list and on pertinent graduate courses offered in the previous year. All three parts must be attempted before the fourth quarter of residence and passed by the seventh. Any students who fail all three parts must retake and pass some one part before the end of their sixth quarter. Any other failed parts must be retaken and passed before the seventh quarter. Accordingly, the examinations are regularly offered at the beginning of each academic year and a make-up, if needed, in the spring quarter.

All students must demonstrate reading proficiency in two of the following languages: German, French, Latin, Classical Greek. The department's formal logic requirement may be satisfied by (a) passing with grade B or better the final examination in Philosophy 110; and (b) passing with grade B or better Philosophy 210 (or another course specifically approved by the department for this purpose). Both logic and language requirements must be satisfied before the student can be advanced to candidacy for the Ph.D.

Students in their third year of residence must take at least one graduate course with regular grades in each quarter until the end of that year or their admittance to candidacy, whichever occurs first.

After passing the written preliminary examination, the student must submit a prospectus of the dissertation to his or her doctoral committee. This committee will then orally examine the student on the intended subject of research. This examination will seek to establish that the thesis proposed is a satisfactory subject of research and that the student has the preparation and abilities necessary to complete the research. This oral qualifying examination must be passed before the beginning of the tenth quarter in

residence. Students who are passed will be advanced to candidacy for the Ph.D.

Under the supervision of the 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.")

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 for the course in which he or she is assisting.

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 examination of the nature of argument, inference, and proof, and their role in philosophical, scientific, and ordinary discourse. (May be used in fulfilling the Warren College formal skills requirement.)

11. Logic and Scientific Reasoning (4)

Application of formal methods to problems in inductive logic, scientific theory confirmation and formalization. (May be used in fulfilling 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.)

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.)

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.)

23-24-25. Man 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 in fulfilling the Revelle College humanities requirement.)

30A-B-C. Judaic Studies (4-4-4)

A three-quarter sequence involving the study of the deep and surface structures of the life styles of one specific culture. The approach from several disciplines addresses itself to analysis of the social, political and economic institutions, the aesthetic structuring through formal artistic expression, and the cultural forms of everyday living.

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.

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.

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.

40A. The Nature of Scientific Theories (4)

This is a course designed to introduce students to some logical and epistemological issues raised by science, including the nature of laws and their role in explanation, the distinction between observational and theoretical terms, the truth of scientific theories.

40B. The Nature of Scientific Theories (4)

Topics in the development and justification of scientific theories, including the nature of discovery, probability theory, and the problem of induction and the nature of scientific change.

Upper Division

101. Plato (4)

A study of some of the major dialogues of Plato. *Prerequisite: department stamp required.*

102. Aristotle (4)

A study of some of the major works of Aristotle. *Prerequisite: department stamp required.*

103. Medieval Philosophy (4)

An examination of the major trends of medieval philosophy through the study of selected texts by such authors as St. Augustine, Aquinas, Scotus, and Ockham. *Prerequisite: department stamp required.*

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.*

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.*

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.*

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 study of logic, using mathematical techniques. The completeness and consistency of the propositional calculus (which embodies the logical behavior of "and", "or", and "not") and the first order predicate calculus (the logic of "all" and "some").

111. Symbolic Logic II (4)

Further development of the predicate calculus and the logic of identity. First-order theories. Löwenheim-Skolem theorem, etc. *Prerequisite: Phil 110 or consent of instructor.*

112. Advanced Logic (4)

An examination of topics in modal or other nonstandard logics, incompleteness results, systems of set theory. Topics will vary from year to year. *Prerequisite: Phil 111 or consent of instructor.*

115. Philosophy of Mathematics and Logic (4)

Key problems in the philosophy of mathematics and logic. The relationship of mathematics to logic, intuitionism, mathematical realism, implication of incompleteness results, etc. *Prerequisite: Phil 10.*

116. The Structure of Science (4)

A study of key questions in the philosophy of science, such as "what constitutes a genuine scientific explanation?", "How is a theory confirmed by evidence?", and so forth.

117. Problems in Scientific Methodology (4)

An examination of philosophical difficulties encountered in the process of scientific research, e.g., problems of space and time, relationships between biological or psychological explanation and those of physics. Topics covered may vary from year to year.

118. Philosophy of Medicine (4)

This course identifies and explores certain aspects of contemporary empirical medicine. Topics include the definition of disease, logical features of diagnosis, medical explanation, the status of medicine as a science, and relations between biology and medicine.

119. Philosophy of Biology (4)

An examination of basic conceptual and logical issues in biology. Topics include: Reductionism, the status of biology as a science, teleological explanation, the logical character of evolutionary theory, sociobiology and ethics.

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.

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.

125. Technology and Human Values (4)

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, education, and on warfare.

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.

150. Aesthetics (4)

An examination of major concepts and issues in aesthetics, such as truth, expression and imagination, the nature of the aesthetic attitude and of critical evaluation.

152. Philosophy and Literature (4)

A study of philosophical themes as presented in selected fiction, drama, or poetry, as well as an inquiry into philosophical puzzles that arise in the appreciation and criticism of literature.

153. Film Aesthetics (4)

A consideration of some special problems in aesthetics relevant to film as an art form. Topics may include: the problem of a film's authorship; whether there are unique assumptions in film criticism and the relation between those assumptions and others relevant to literature, drama, and visual art; unity, theme, narration, and structure in film; "high art" — "low art" distinctions; films as representational.

160. Philosophy of Religion (4)

This course provides a general introduction to the philosophy of religion through the study of classical and contemporary texts. Among the issues to be discussed are the existence and nature of God, the problem of evil, the existence of miracles, the relation between reason and revelation, and the nature of religious language.

161. Religious Existentialism (4)

This course will deal with the existential approach to the religious life and with conceptions such as faith, freedom, and guilt. Authors studied in a particular term may vary and will include Pascal, Kierkegaard, Dostoevski, Buber, and Tillich.

162. Philosophy of Law (4)

An introduction to selected topics and problems such as the nature of law and legal systems, the relationship of law to morality, theories of punishment and legal responsibility, issues of civil disobedience, privacy, paternalism, and affirmative action.

164. Philosophy of History (4)

A study of classical and contemporary conceptions of history and historical knowledge.

166. Philosophy of Social Science (4)

An examination of problems arising out of the concepts, methods and goals characteristic of the social sciences, incorporating current materials from these disciplines, problems such as causal vs. rational explanation, the individual vs. the social whole as unit of study, the meaning and possibility of objectivity, freedom or determinism as a presupposition or consequence of theory, the role of values, etc.

168. Philosophy of Psychology (4)

Philosophical problems in the foundations of psychological theorizing and the modeling of mind. Topics may include the status of psychological mechanisms, the unconscious, mental states and processes, problems in psychological explanation.

170. Metaphysics (4)

The content of this course will vary from year to year, but in each case it will center around fundamental problems in metaphysics, such as the mind-body problem, problem of universals or the other minds problem. The discussion of these issues may be either historical or analytic or both, depending upon the interests of the instructor.

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. Senior Colloquium (4)

A seminar dealing with the examination of specific philosophical problems and topics, designed for seniors of high standing who major in philosophy. *Prerequisites: senior status and consent of department.* May be repeated for credit.

185. Special Topics (4)

A course devoted to a specific philosophical problem.

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

200. Proseminar in the History of Philosophy (4)

A course of studies designed to prepare students for advanced work in seminars.

201. Greek Philosophy (4)

A study of selected authors and texts from the history of ancient Greek philosophy.

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.

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*.

206. Nineteenth-Century Philosophy (4)

A selective study of major philosophical texts of the period with emphasis on such figures as Hegel, Marx, Nietzsche, Mill, and others.

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.

210. Philosophy of Logic (4)

A study of major topics in logical theory, together with a close examination of contributions by different philosophical schools to the analysis of central issues in philosophy of logic. *Prerequisite: Phil 110 or equivalent.*

211. Advanced Symbolic Logic (4)

An intensive examination of propositional and quantificational logic as a basis for further deductive development. *Prerequisite: Phil 110 or equivalent.*

Physical Education

212. Philosophy of Science (4)

An examination of such problems as concept formation, the explanation of law, the role of logic and mathematics in the sciences.

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.

235. Philosophy of Language (4)

Examination of some current philosophical and scientific views on the nature, use, and acquisition of natural languages.

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 presuppositions of historical experience in the context of 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.

280. Department of Philosophy Colloquium (4)

Special topics submitted by visiting philosophers for critical appraisal by staff and students. (S/U grades permitted.)

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 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

Supervisors:

Howard F. Hunt, Ph.D. (*Chairman*)

John H. Douglass, Ph.D.

Theodore W. Forbes, Ed.D.

Frank N. Vitale, M.A.

Bert N. Kobayashi, Ph.D.

James R. White, Ph.D.

Associate Supervisors:

John W. Cates, M.A.

J. Barry Cunningham, Ed.D.

J. Charles Millenbah, M.A.

Robert C. Moss, M.S.

Andrew Skief, Jr., M.S.

Judith M. Sweet, M.S.

Assistant Supervisors:

Sharon H. Carelas

Diana E. Dann, M.S.

Margaret C. Marshall, M.F.A.

Walter W. Muryasz, B.A.

Alice E. Rincon, M.F.A.

Patricia A. Rincon, M.F.A.

Carolyn T. Ryback, M.A.

Joyce Schumaker, M.F.A.

Benso Tsuji

Steve E. Ubl

Tad Yamaguchi, A.A.

* * *

"Activity" and "participation" describe the many programs of the Department of Physical Education. Modern facilities provide an activity center for class sections in a wide variety of coeducational lifetime activities, casual recreation ("doing your own thing"), and organized competition for the novice or expert through intramural or intercollegiate competition. Gymnasiums, natatorium, tennis courts, and playing fields are a hub of campus life for all students who want to learn a new sport, perfect a skill, join fellow students in an activity club, or compete against fellow students or those from neighboring colleges. All students are entitled to locker and towel issue and can use all facilities which also include sailing on Mission Bay.

Learning to Be Active and Fit

Courses listed below offer a wide variety of choices in aquatics, lifetime sports, fitness for living, combatives, and officiating. Most classes meet twice weekly for one-hour sessions with sections offered according to skill levels. Enrollment is voluntary and students are encouraged to sign up for one or more courses of their choice.

PARTICIPATING IN ACTIVITIES

Intramural Sports

Intramural sports provide a diversity of sports in which all students may participate each quarter. Intramurals are the most popular activity on campus and are perhaps the best method for meeting new friends. Leagues are arranged by the competitive desires of the participants and thus range from the highly skilled to those merely out for exercise and fun with little or no regard for winning. The emphasis is toward coed sports (men and women on the same team) as the department believes the social and physical aspects are equally important. Activities include men's and coed competition in flag football, innertube water-polo, floor hockey, volleyball, basketball, soccer, softball, and tennis. Come and join the fun.

Recreational Clubs

The recreational clubs play a varied and active role in the students' life on campus. At present there are thirty-four clubs open for participation. These include: aikido, archery, ballroom dance, belly dance, conditioning, frisbee, gymnastics, handball/raquetball, disco, Israeli dance, jazz dance, judo, karate, outing, SCUBA, snow skiing, table tennis, tennis, and yoga (hatha).

Special Events

The campus special events program provides a quarterly schedule of major and recreation-oriented special events that are designed to attract students from all segments of the campus. Events are selected, approved, and evaluated by a student committee under the direct supervision of a recreation supervisor. Major campus-wide activities include dances, carnivals, festivals, casino nights, etc., while recreation-oriented events include bike races, cross-country runs, over-the-line tournaments, superstars all-sports competition, etc.

Outdoor Recreation

Special events are scheduled off campus including backpacking, cross-country skiing, rock climbing, kayaking, mountaineering. Workshops, seminars, and discussions on wilderness cookery, first aid, and orienteering are given. These are unique experiences in non-competitive activities for students.

An equipment rental program is available to students for short term use.

Aquatic Sports

The Mission Bay Aquatic Center on Santa Clara Point, Mission Bay, is only seven miles from campus. Classes are offered in waterskiing, sweep rowing, surfing, SCUBA diving, and sailing (Hobie cats, sloops, and cat rigged). Recreational sailing, waterskiing, and rowing are also available.

Casual Recreation

Many hours are available to use gymnasium and pool facilities. Noontime and evening volleyball, badminton, or basketball games are popular, and the sauna is open from 8 a.m. to 10 p.m. daily. The sailing facility on Mission Bay at Santa Clara Point is also popular.

Intercollegiate Athletics

Students possessing a high degree of proficiency and interest in sport skills may compete against other Southern California colleges and universities in regularly scheduled men's and women's, and coed athletic events. Presently thirty-one UC San Diego teams represent the campus. Participation is entirely voluntary; students are encouraged to compete for the pleasure of participation. For further information, contact the intercollegiate office.

Courses

Registration for physical education classes takes place along with regular academic enrollment, except intercollegiate teams, for which students must check with the intercollegiate office. Consult the *Schedule of Classes* issued by the Office of the Registrar for specific course offerings. Not all courses are offered each quarter. Several levels of skill proficiency follow:

- A. Introductory level (intended for those who have never participated 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-C-D. Swimming (0)

Designed to permit students to gain or improve swimming strokes, techniques, and aquatic skills on an individual basis.

2. Synchronized Swimming (0)

Designed for advanced swimmers. Fundamentals in individual and group water ballet. Opportunity for public presentations.

3. Lifesaving (0)

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 (0)

Standard American Red Cross course to train authorized water-safety instructors 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.*

7A-D. Skin-Diving (0)

Techniques of skin-diving and practical experience. Introductory course will include lectures on equipment, environment, and principles of skin-diving with pool training. Advanced course will emphasize practical experience in ocean dives. *Prerequisite: consent of instructor.*

9C. Intermediate SCUBA Diving (0)

Course is designed to propel the beginning/newly certified, inexperienced SCUBA diver safely through the awkward first ten dives in the ocean environment. It will introduce the diver to many aspects of SCUBA so as to inspire self-confidence and to enhance enjoyment. *Prerequisite: current certification as SCUBA diver under one of the following: NAUI, YMCA, NASDS, SIO/UC, SCIP, LA County, or consent of instructor. Students must furnish all basic gear.*

9E. Advanced SCUBA Diving (0)

A course designed to orient the intermediate SCUBA diver to the La Jolla oceanic environment at depth of forty- to one-hundred feet — submarine canyon diving and boat diving in the La Jolla/Del Mar/Solana Beach/Point Loma waters. *Prerequisite: successful completion of the UC San Diego Intermediate SCUBA course, or equivalent. Students must furnish all gear.*

9F. Master Scuba (0)

This course provides the advanced SCUBA diver with the methods of beachmastering/divemastering/boatmastering, techniques of deep diving, detailed knowledge of pertinent SCUBA topics, and insight into auxiliary activities associated with SCUBA. *Prerequisite: successful completion of the UC San Diego advanced SCUBA diver course. Student must furnish all gear.*

10A-B. Surfing (0)

Surfing techniques taught in pool including mounting, sitting, paddling, and turning surfboard, safety techniques. Only after mastery of pool techniques will student be allowed to surf in ocean. *Prerequisites: ability to swim 400 yards, basic lifesaving skills, and UC San Diego beginning swimmer's certificate.*

10C. Surfing, Intermediate (0)

A continuation of PE 10A-B, for the more advanced student. Section 10C includes instruction in more advanced techniques and skills. *Prerequisites: same as 10A-B, plus performance at advanced level or satisfactory completion of 10A or 10B.*

11A-B-C-D. Sailing (0)

Course is designed to make sailing an easily understood sport and provide students an opportunity for a lifetime of stimulating and relaxing activity. Special emphasis is placed on nautical terms, water and safety rules, demonstrations, and practical exercises in rigging and boat handling. (Offered at Mission Bay Aquatic Center.)

14A-B-C-D-E. Tennis (0)

Instruction in the fundamentals of the serve, strokes, volley, rules, scoring, tactics, and court strategy.

15A-C-E. Badminton (0)

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-D-E. Volleyball (0)

An emphasis on fundamental skills in serving, spiking, blocking, and teamwork techniques. Opportunity for team competition.

17A-C. Golf (0)

Instruction and practice in the fundamentals of golf. Emphasis is placed upon golf swing and techniques of using all clubs under varying conditions.

19. Squash (0)

Introduction to the sport, including instruction in fundamental skills and techniques, individual and group practice, and opportunities for competition.

20. Handball (0)

Instruction in fundamentals of the serve, rally, and court strategy. Opportunity for singles and doubles competition.

21A-B. Modern Dance (0)

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.

21C. Intermediate Modern Dance (0)

The content of the intermediate modern class is based on the language of body movement. All types of movement are explored and reexplored, developing mind and body coordination and kinetic resources. Various techniques are taught in the styles of Jose Limon, Merce Cunningham, Martha Graham, Doris Humphrey, Eugene Loring, and Margaret Marshall (instructor). *Prerequisites: Beginning Modern Dance and or consent of instructor.*

22A-B. Jazz Dance (0)

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.

22C. Jazz Dance Intermediate (0)

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, and publicly performing the final dance at the end of the quarter. Students learn techniques and body control, advancing toward performance. *Prerequisites: Beginning Jazz Dance and or consent of instructor.*

23A-B-C. Ballet (0)

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.

25A-B-C. Tap Dance (0)

Emphasis on rhythm, coordination, timing, and style. 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 will include more complicated steps and rhythms.

26A-B-C. Ballroom Dance (0)

Course will include four to six basic variations of foxtrot, tango, waltz, samba, rhumba, and swing. Includes discussions and instruction by students and current trends in social dance, e.g. hustle, bus stop.

28. Elements of Mind/Body Movement (0)

Designed to acquaint students with mechanical and mental relationships needed to produce coordinated movement. Includes mechanics of body coordination, mind dynamics, and training.

29. Soccer (0)

Instruction in fundamentals. Skills, game strategy, and team play are included.

30. Softball Skills and Strategies (0)

Course instruction will include demonstrations, handout materials, films, drills, strategy lectures, and supervised play. Special emphasis will be placed on cultivating visualization, a process for facilitating major skill improvement in a short period of time.

Physics

31A-B-C. Psychology of Officiating I, II, and III (0)

Emphasis on proper use of officiating mechanics and effective interpreting of basketball and baseball rules. Provides students with positive mental attitude through exposure to dynamics of self-motivation.

32. CPR (0)

Basic life support — emergency first aid procedures in respiratory and cardiac arrest and proper applications of cardiopulmonary resuscitation.

33A-C. Conditioning — Coed (0)

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 cardio-vascular efficiency, weight training, isometrics, circuit training, cross-country runs, etc.

34. Weight Training (0)

Participation in individual exercise routines, running, weight, and strength exercises to increase general fitness, endurance, and muscular efficiency.

35. Exercise, Nutrition, and Weight Control (0)

Theory and practice of regular exercise and nutritional needs for development, maintenance, and continuation of good health.

38A-B-C-D-E. Basketball (0)

Instruction in fundamentals is combined with opportunities for team play. Some previous knowledge of the game is desirable since emphasis will be on vigorous completion.

40A-B-C-D. Gymnastics (0)

Fundamentals of gymnastics, including instruction on the use of apparatus and tumbling routines.

47A-C-D. Fencing, Foil (0)

Classical French style protocol, on guard, advance and retreat, attacks (simple and compound), parries (simple and compound), strategy, and basic rules.

49. Fencing, Theatrical (0)

Fencing techniques useful to students involved in performing arts. Emphasis will be upon choreography and dramatic presentation.

50A-B-C-D. Karate (0)

Instruction and training in the fundamentals of Sho-to-kan karate, emphasizing: basic stances and techniques, "kata," ancient stylized sequences of defensive and counteroffensive movements, sparring, a graded progression from strictly controlled defense and counter-attack situations to free sparring for competition.

52A-C. Judo (0)

Includes origin and development of judo, nature and basic rules of judo contests, basic techniques and terminology. Intermediate and advanced judo emphasizes improvement of skills and intraclass competition.

53A-C. Aikido (0)

Instruction and training in fundamentals of aikido. Provides a nonaggressive, noncompetitive art of self-defense for men and women through development of individual sense of balance, timing, and mental attitude.

54A-D. First Aid (0)

Standard and advanced course. Upon successful completion of the course, the student is awarded a Red Cross certificate. Prepares the student to render effective first aid in treatment of wounds, burns, fractures, dislocations, artificial resuscitation, and other emergency conditions. Laboratory practice on splints and bandaging.

57A-B-C. Self Defense I, II, III (0)

Designed to familiarize students, women particularly, with methods of self-defense. Mainly directed toward students not involved in martial arts. Deals with psychology of self-defense situation. Students may enter at any level.

59A. Applied Rehabilitation for Post Muscle and Joint Trauma (0)

The course is to provide injured students (students with muscle and joint trauma) with specific information and instruction concerning the nature of tissue injury, the rehabilitative process, and preventive measures useful in avoiding or reducing further injury. *Prerequisite: referral from attending physician.*

59G. Physical Activity for the Disabled Student (0)

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 to develop greater self-confidence.

Intercollegiate Athletics (0)

A wide variety of intercollegiate sports activities is offered to all undergraduate students. The program is designed for those who possess a high degree of proficiency in sport skills. Competition with other colleges and universities is scheduled.

Not all teams listed below have formed. Additional information is available in the intercollegiate office.

61. Baseball

62. Basketball

63. Crew

64. Cross-Country

65. Fencing

66. Golf

68. Karate

69. Rugby

70. Sailing

71. Snow Skiing

72. Soccer

73. Surfing

74. Swimming

75. Tennis

76. Track and Field

77. Volleyball

78. Water Polo

80. Badminton

83. Cycling

84. Softball, Women's

85. Racquetball

Bernd T. Matthias, Ph.D.

Carl E. McIlwain, Ph.D.

S. Maurice Montal, M.D., Ph.D.

Thomas M. O'Neil, Ph.D.

Laurence E. Peterson, Ph.D.

Oreste Piccioni, Ph.D.

Sheldon Schultz, Ph.D.

Lu Jeu Sham, Ph.D.

Harry Suhl, Ph.D.

Robert A. Swanson, Ph.D.

William B. Thompson, Ph.D.

John C. Wheatley, Ph.D.

David Y. Wong, Ph.D. (*Chairman*)

Chia-Wei Woo, Ph.D.

Nguyen-Huu Xuong, Ph.D.

Herbert F. York, Ph.D.

Associate Professors:

Donald R. Fredkin, Ph.D.

Wayne Vernon, Ph.D.

M. Brian Maple, Ph.D.

Assistant Professors:

Oscar Lumpkin, Ph.D.

H. Eugene Smith, Ph.D.

* *

The Undergraduate Program

THE MAJOR PROGRAM

The upper-division program 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 course 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 with the modern view of atomic and some aspects of sub-atomic 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.

PHYSICS

OFFICE: 3430 Mayer Hall, Revelle College

Professors:

Keith A. Brueckner, Ph.D.

E. Margaret Burbidge, Ph.D.
(*Astronomy*)

Geoffrey R. Burbidge, Ph.D.
(*Astrophysics*)

Joseph C. Y. Chen, Ph.D.

George Feher, Ph.D.

William R. Frazer, Ph.D.

John M. Goodkind, Ph.D.

Robert J. Gould, Ph.D.

Francis R. Halpern, Ph.D.

Walter Kohn, Ph.D.

Norman M. Kroll, Ph.D.

Leonard N. Liebermann, Ph.D.

Ralph H. Lovberg, Ph.D.

Shang-Keng Ma, Ph.D.

John H. Malmberg, Ph.D.

George E. Masek, Ph.D.

A grade-point average of 2.0 or higher in the upper-division major program is required for graduation.

The following courses are required for the physics major:

- a. Lower division:
 (1) Physics 2A-B-C-D and 2CL-DL; or Physics 3A-B-C-D, or 3CL or 2CL, and 2DL.
 (2) Chemistry 6A-B, or 7A-B and Chemistry 8AL.
 (3) Mathematics 2D-E-F or 2DA*-EA*-F.

*Strongly recommended.

- b. Upper division:
 (1) Physics 100A-B-C, 110A-B, 120A-B, 130A-B, 140A-B, and two additional laboratory courses from the following group: 121, 131, 132, 170, or 199 with departmental approval.
 (2) Mathematics 110.
 (3) Restricted Electives: Three upper-division or graduate courses in natural sciences or mathematics, subject to departmental approval; one elective must be in mathematics (Math 120A recommended).

c. Suggested Schedule:

FALL	WINTER	SPRING
Junior Year		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Physics 110B	Physics 120A
Restricted Elective	Math 110	Restricted Elective
Senior Year		
Physics 120B	Physics 121	Physics 132 or 170
Physics 130A	or 131	Restricted Elective
Physics 140A	Physics 130B	
	Physics 140B	

Physics Major with Specialization in Biophysics

The upper-division program 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 departmental adviser for biophysics.

The following courses are required for the physics major with specialization in biophysics.

- a. Lower division:
 (1) Physics 2A-B-C-D and 2CL-DL, or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.

- (2) Chemistry 6A-B-C, or 7A-B and Chemistry 8AL-BL.
 (3) Biology 1.
 (4) Mathematics 2D-E-F or 2DA-EA-F.

- b. Upper division:
 (1) Physics 100A-B-C, 110A, 120A-B, 130A-B, 153.
 (2) Chemistry 131, 140A-B, 143A.
 (3) Biology 101, 103, 106, 111, 131.
 (4) Mathematics 110.
 (5) Restricted Elective: Mathematics 120A or Frontiers of Science 128.

c. Suggested Schedule:

FALL	WINTER	SPRING
Junior Year		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Math 110	Restricted Elective
Chemistry 140A	Chemistry 140B	Physics 120A
Chemistry 143A	Biology 131	
Senior Year		
Physics 130A	Physics 130B	Biology 103
Physics 120B	Biology 106	Biology 111
Biology 101	Chemistry 131	Physics 153

Physics Major with Specialization in Biophysics-Premedical

The upper-division program 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.

The following courses are required for the physics major with specialization in biophysics-premedical:

- a. Lower division:
 (1) Physics 2A-B-C-D and 2CL-DL, or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.
 (2) Chemistry 6A-B-C, or 7A-B, and Chemistry 8AL-BL.
 (3) Biology 1.
 (4) Mathematics 2D-E-F or 2DA-EA-F.
- b. Upper division:
 (1) Physics 100A-B-C, 110A, 120A-B, 130A, 153.
 (2) Chemistry 126 or 131, 140A-B, 143A.
 (3) Biology 101, 106, 111, 131.
 (4) Restricted Electives: one Biology course (Biology 121, 122, or 125), and an upper-division or graduate course in natural sciences or mathematics.

c. Suggested Schedule:

FALL	WINTER	SPRING
Junior Year		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Biology 131	Physics 120A
Chemistry 140A	Chemistry 140B	Chemistry 143A
		Biology 101
Senior Year		
Physics 120B	Chemistry 126	Physics 153
	or 131	
Physics 130A	Biology 111	Restricted Elective
Biology 106	Restricted Elective	

Physics Major with Specialization in Earth Sciences

The upper-division program is essentially the same as the standard physics major augmented by courses in earth sciences.

The following courses are required for the physics major with specialization in earth sciences:

- a. Lower division:
 (1) Physics 2A-B-C-D and 2CL-DL, or Physics 3A-B-C-D, 3CL or 2CL, and 2DL.
 (2) Chemistry 6A-B, or 7A-B, and Chemistry 8AL.
 (3) Mathematics 2D-E-F or 2DA-EA-F.
- b. Upper division:
 (1) Physics 100A-B-C, 110A-B, 120A-B, 130A, 140A-B.
 (2) Earth Science 101, 102, 103, 120.
 (3) Mathematics 110.
 (4) Restricted Electives: Two upper division or graduate courses to be chosen with the approval of the earth science adviser.

c. Suggested Schedule:

FALL	WINTER	SPRING
Junior Year		
Physics 100A	Physics 100B	Physics 100C
Physics 110A	Physics 110B	Physics 120A
Earth Science 101	Math 110	Earth Science 102
	Earth Science 103	
Senior Year		
Physics 120B	Physics 140B	Restricted Elective
Physics 130A	Restricted Elective	Earth Science 120
Physics 140A		

Engineering Physics Program

The engineering physics program is offered jointly by the Departments of Physics, AMES, and EECS, and is administered by the Department of EECS. See "EECS, Engineering Physics Program."

MINOR IN PHYSICS

Students may arrange minor programs or programs of concentration in physics by consulting with the Department of Physics.

The Graduate Program

The Department of Physics offers curricula leading to the Master of Science and Doctor of Philosophy degrees in physics. For students specializing in the area of biophysics, the degree Ph.D. in physics (biophysics) is offered.

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 office. There is no foreign language requirement.

DOCTORAL DEGREE PROGRAM

The Ph.D. program consists of three components: graduate courses, apprenticeship in research, and thesis research. In addition, opportunities for teaching are provided. The department has developed a flexible program which provides a broad, advanced education in physics while at the same time giving students opportunity for emphasizing their special interests.

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. After two years of graduate study, or earlier, they 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. Typically, thesis work takes two or three years. 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.

First-Year Written Examination

Students are required to take a written examination after completing one year of graduate work at UC San Diego. Biophysics students take this examination after completing two years of graduate work. The examination is on the level of material usually covered in undergraduate courses and the first-year graduate physics courses listed below. It 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.

First-Year Graduate Courses

Fall:

Physics 200A (Theoretical Mechanics)
Physics 203A (Adv. Classical Electrodynamics)
Mathematics 210A (Mathematical Methods)

Winter:

Physics 200B (Theoretical Mechanics)
Physics 212A (Quantum Mechanics)
Mathematics 210B (Mathematical Methods)

Spring:

Physics 203B (Adv. Classical Electrodynamics)
Physics 212B (Quantum Mechanics)
Mathematics 210C (Mathematical Methods)

Second-Year Oral Examinations

Students are required to take two oral examinations after completing two years of graduate work or earlier. Biophysics students take these examinations no later than the spring of their third year of graduate work.

(1) General

The general oral examination, administered by a faculty committee, tests general mastery of advanced physics. Students are asked to indicate areas in which they have special competence and are questioned more intensively in these areas. The examination is offered twice a year, at the beginning of the fall and spring quarters, and lasts approximately one hour.

This examination will be waived for students who obtain credit (C or better) in six advanced courses selected from the second-year physics graduate courses listed below, provided that they obtain at least a 3.0 average in five out of the six. The selection must include all of Group I. Biophysics students select eighteen units of courses from two of the five categories under courses related to life sciences listed below. A list of acceptable courses within these categories is available in the department office.

Second-Year Physics Graduate Courses

Group I: (3)

Physics 212C (Quantum Mechanics) fall
Physics 210A (Statistical Mechanics) fall
Physics 210B (Statistical Mechanics) winter

Group II: (3)

Physics 206 (Biophysics) winter
Physics 211 (Solid State Physics) spring
Physics 213 (Theoretical Nuclear Physics) winter
Physics 215 (High Energy Nuclear Physics) spring
Physics 216 (Atomic and Molecular Theory) fall
Physics 218A (Plasma Physics) winter
Physics 219 (Astrophysics) fall
Physics 225A (General Relativity) winter

Courses Related to Life Sciences

Category 1 Biochemistry
Category 2 Molecular Biology
Category 3 Genetics
Category 4 Physiology
Category 5 Cell Biology

(2) Oral Presentation of A Topic

This examination is held two weeks following the general oral examination and lasts approximately one and one-half hours. Three topics of current interest in physics or biophysics, together with relevant references, are made available to students who present to a faculty committee a one-half hour talk on one of the topics, followed by approximately one hour of questioning related to the topic. The oral examinations may be repeated once the next time they are offered.

Qualifying Examination

After students have passed the departmental examinations, they should obtain a faculty research supervisor. When they are ready to demonstrate their ability to engage in thesis research, they may take the qualifying examination.

Thesis Defense

When students have completed their theses, they are asked to present and defend them before their doctoral committees.

Advanced Courses and Seminars

In addition to the above-listed basic courses, the department offers a weekly general departmental colloquium, advanced courses for students doing specialized research, and seminars in the main departmental areas of interest. Students are strongly urged to enroll for credit in appropriate advanced courses and seminars.

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 science curriculum has been revised effective fall, 1980-81. Old course sequences which started in 1979-80 will be completed during 1980-81. The following courses will be offered in 1980-81:

FALL	WINTER	SPRING
NS 2C*	Phys 1A	Phys 1B
NS 2CS*	Phys 1B	Phys 1BL
NS 2CL*	Phys 1BL	Phys 1C
Phys 1A	Phys 2A	Phys 1CL
Phys 2A*	Phys 2AS	Phys 2B
Phys 2AS	Phys 2AL	Phys 2BL
Phys 2AL	Phys 2B	Phys 2C
Phys 3A	Phys 2BL	Phys 2CL
Phys 3C*	Phys 3B	Phys 3C
Phys 3CL*	Phys 3D*	Phys 3CL
	Phys 3DL*	Phys 5
		Phys 11
		S/T 10C

The following courses will be offered in 1981-82:

FALL	WINTER	SPRING
Phys 1A	Phys 1A	Phys 1B
Phys 1C	Phys 1B	Phys 1BL
Phys 1CL	Phys 1BL	Phys 1C
Phys 2A	Phys 2A	Phys 1CL
Phys 2AS	Phys 2AS	Phys 2B
Phys 2AL	Phys 2AL	Phys 2BL
Phys 2C	Phys 2B	Phys 2C
Phys 2CL	Phys 2BL	Phys 2CL
Phys 2D	Phys 2D	Phys 3C
Phys 2DL	Phys 2DL	Phys 3CL
Phys 3A	Phys 3B	Phys 5
Phys 3D		Phys 11
		S/T 10C

The new Physics 1 sequence (which replaces the old Natural Science 1D-E and Science and Technology 15A-B-C sequences) is acceptable for biology and chemistry majors and will satisfy the Revelle general-education physics requirement (see major departmental and college requirements).

The new Physics 2 sequence (which replaces the old Science 4A-B-C, Natural Science 2A-B-C, and Physics 2A-B-C sequences) is intended for physical science and engineering majors and those biological science majors with strong mathematical aptitude.

The new Physics 3 sequence (which starts in the fall rather than the winter) is an honors sequence for students with a strong high school physics and calculus background and who are capable of carrying a heavy workload.

*See 1979-80 General Catalog for course description.

1A. Physics (4)

A calculus-based introductory physics course covering vectors, equilibrium of a particle, moment of a force, rectilinear motion, Newton's second law, motion in a plane, work and energy, impulse and momentum, rotation, harmonic motion and hydrostatics. *Prerequisites: Phys. 1A, concurrent enrollment in Math. 1C or Math. 2B.* (F,W)

1B. Physics (4)

Continuation of Physics 1A covering Coulomb's law, Gauss' 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, concurrent enrollment in Math. 1C or Math. 2B.* (W,S)

1BL. Physics Laboratory (1)

Five three-hour laboratories covering statistical analysis of experimental data, viscosity and rotational motion, the cathode ray oscilloscope and wave generator, the RC circuit and the feedback amplifier. *Prerequisite: concurrent enrollment in Phys. 1B.* (W,S)

1C. Physics (4)

Continuation of Physics 1B covering traveling waves, electromagnetic waves, the nature and propagation of light, reflection and refraction, images formed by reflection and refraction, lenses and optical instruments, interference and diffraction, polarization, photons, electrons and atoms, molecules and solids, nuclear physics. *Prerequisite: Phys. 1B.* (F,S)

1CL. Physics Laboratory (1)

Five three-hour laboratories covering mechanical equivalent of heat, Young's interference experiment, lenses and the human eye, the photoelectric effect and optical spectra. *Prerequisite: concurrent enrollment in Phys. 1C.* (F,S)

2A. Physics (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, conservation of linear momentum, collisions, rotational kinematics, rotational dynamics, fluid mechanics. *Prerequisites: Math. 2A, concurrent enrollment in Math. 2B.* (F,W)

2AS. Physics (4)

Same as Physics 2A except that it is offered as a self-paced (Keller plan) course. *Prerequisites: Math. 2A, concurrent enrollment in Math. 2B.* (F,W)

2AL. Physics Laboratory (2)

One hour lecture and three hours laboratory covering introduction to data reduction and error analysis, linear and rotational forces, conservation of energy and momentum, angular momentum and moment of inertia, and fluid flow in tubes.

Prerequisite: concurrent enrollment in Phys. 2A, 2AS, or 3A. (F,W) EECS staff

2B. Physics (4)

Continuation of Physics 2A covering gravitation, charge and matter, the electric field, Gauss' law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuit, the magnetic field, Ampere's law, Faraday's law, inductance and magnetic properties of matter. *Prerequisites: Phys. 2A and concurrent enrollment in Math. 2C.* (W,S)

2BL. Physics Laboratory (2)

One hour lecture and three hours laboratory covering measurement of temperature, operation of cathode ray oscilloscope, electrical resistance, inductance, the LR circuit and transformers, RC and RLC circuits. *Prerequisite: concurrent enrollment in Phys. 2B or 3B.* (W,S) EECS staff

2C. Physics (4)

Continuation of Physics 2B covering temperature, heat and first law of thermodynamics, oscillations, waves in elastic media, sound waves, electromagnetic oscillations, electromagnetic waves, geometric optics, interference, diffraction and spectra. *Prerequisites: Phys. 2B, Math. 2C, concurrent enrollment in Math. 2D or 2DA.* (F,S)

2CL. Physics Laboratory (1)

Five three-hour experiments to be chosen from basic circuits and error analysis, LRC circuits, measurement of magnetic fields, refraction, interference and diffraction of microwaves, geometric optics, acoustic resonance and mechanical waves. *Prerequisite: concurrent enrollment in Phys. 2C or 3C.* (F,S)

2D. 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, atomic view of solids, natural radioactivity. *Prerequisite: Phys. 2B.* (F,W)

2DL. Physics Laboratory (1)

Five three-hour experiments to be chosen from laser diffraction and multipliers, interferometer, e/m ratio of particles, photoelectric effect, atomic spectra, radioactive decays, Hall effect. *Prerequisite: concurrent enrollment in Phys. 2D or 3D.* (F,W)

3A. Physics (4)

An honors course for students with serious interest in physics and strong high school physics and calculus background. The topics covered are in close parallel to those in the Physics 2 sequence, but the students are expected to carry significantly heavier workload in Physics 3. Fluid mechanics, heat and temperature are omitted in this sequence, but Maxwell's theory of electricity and magnetism will be covered in depth. The topics covered in Physics 3A are vectors, motion in one and two dimensions, particle dynamics, work and energy, conservation of energy, conservation of linear momentum, collisions, rotational kinematics, rotational dynamics gravitation. *Prerequisites: Math. 2A and concurrent enrollment in Math. 2B.* (F)

3B. Physics (4)

Continuation of Physics 3A covering charge and matter, electric field, Gauss' law, electric potential, capacitors and dielectrics, current and resistance, electromotive force and circuits, magnetic field, Ampere's law, Faraday's law, inductance, electromagnetic oscillations, alternating current, Maxwell's equations. *Prerequisites: Phys. 3A, concurrent enrollment in Math. 2C.* (W)

3C. Physics (4)

Continuation of Physics 3B covering oscillations, waves in elastic media, sound waves, Maxwell's equations, electromagnetic waves, the nature and propagation of light, reflection and refraction, geometric optics, interference, diffraction, polarization. *Prerequisites: Phys. 3B, concurrent enrollment in Math. 2D or 2DA.* (S)

3CL. Physics Laboratory (2)

An honors laboratory involving statistical analysis, electric fields, LRC circuits and magnetic fields. One hour lecture and three hours laboratory per week. *Prerequisite: concurrent enrollment in Phys. 3C.* (S)

3D. Physics (4)

A modern physics course covering relativistic kinematics, relativistic dynamics, particle aspects of electromagnetic radiation, wave aspects of material particles, the structure of the hydrogen atom, many electron atoms, nuclear structure, molecular and solid state physics. *Prerequisites: Phys. 3C, Math. 2D or 2DA.* (F)

Physics

5. The Skies (4)

Introductory descriptive (non-mathematical) account of modern astronomy, with emphasis on what is observed and on the development of ideas. The earth's place in the universe, the sun, the birth, life and death of stars, galaxies and cosmology. This course, Earth Sciences 1 (The Oceans), and Earth Sciences 4 (The Nature of the Earth) form a three-course sequence for general interest in science. (S)

Science and Technology 10C. Physics

See course listings: "Science and Technology"

11. Introductory 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)

31A. The Perspective of Physics (4)

A qualitative introduction to the basic ideas of macroscopic physics: mechanics, conservation laws, basic laws of thermodynamics, fields, gravitation and planetary motion, electricity and magnetism, electromagnetic waves. Introduction to relativity. *Prerequisite: Math. 4C or equivalent.* (Not offered in 1980-81.) (F)

31B. The Perspective of Physics (4)

A qualitative introduction to the basic ideas of microphysics. The perfect gas — ideas of kinetic theory, physics of atomic systems, electrons and their properties — origins of quantum mechanics, basics of quantum mechanics, atomic structure — origins of chemical behavior — nuclei and elementary particles. *Prerequisite: Phys. 31A.* (Not offered in 1980-81.) (W)

31C. The Perspective of Physics (4)

A qualitative introduction to the frontier problems in biophysics and the current approaches to their solution. Emphasis on the fundamental physical principles which govern complex living processes from the molecular and cellular phenomena to the animal and human systems. *Prerequisite: Phys. 31B.* (Not offered in 1980-81.) (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. *Prerequisite: Math. 2D-E-F, co-registration in Math. 2F permitted.* (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, Math. 2F.* (W)

100C. Electromagnetism (4)

Electromagnetic waves, radiation theory; application to optics, motion of charged particles in electromagnetic fields, relation of electromagnetism to relativistic concepts. Four hours' lecture. *Prerequisite: Phys. 100B.* (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. *Prerequisite: Math. 2D-E, co-registration Math. 2F.* (F)

110B. Mechanics (4)

Special relativity; Lagrange's and Hamilton's equations; small oscillations of coupled systems; non-inertial frames; general motion of rigid bodies. Four hours' lecture. *Prerequisites: Phys. 110A, Math. 2F.* (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. 100A, 100B, and a lower division physics laboratory sequence.* (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. Electrical and Magnetic Materials (4)

Dielectrics (including ferroelectrics), conductors, semiconductors, liquid crystals, superconductivity, magnetism. Applications of materials in modern technology. *Prerequisite: AMES 11.* (Not offered in 1980-81.) (F)

130A. Quantum Physics (4)

Atomic physics in the nineteenth century; radioactivity, Rutherford experiments; Bohr model, optical spectra, X-ray spectra, electron spin, vector model. Four hours' lecture. *Prerequisites: Math. 110 or equivalent, Phys. 100A-B-C or equivalent, Phys. 110A or other upper-division physical science course.* (F)

130B. Quantum Physics (4)

Atomic structure according to wave mechanics; Schrödinger equation for hydrogen-like atoms; Pauli principle, Heisenberg principle, particle in a periodic potential. Four hours' lecture. *Prerequisite: Phys. 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. One hour lecture, four hours' laboratory. *Prerequisite: Phys. 130A.* (W)

132. Modern Physics Laboratory (2)

Experiments in atomic physics, optics, physical electronics, fluid dynamics, surface physics, etc. One hour lecture, four hours' laboratory. *Prerequisites: Phys. 130A-B.* (S)

140A-B. Thermal Physics (4)

Thermodynamics, including the first, second and third laws; thermodynamic potentials; phase transitions; applications to low-temperature physics, radiation and chemical reactions. Elementary statistical mechanics, probabilistic interpretation of entropy, fluctuation phenomena, transport phenomena. Four hours' lecture. *Prerequisite: Phys. 110A.* (F,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. *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, electronic transport phenomena. Four hours' lecture. *Prerequisites: Phys. 130B, 140B.* (S)

153. Topics in Biophysics (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. *Prerequisite: upper-division standing in biology, chemistry, or physics, or consent of instructor.* (S)

154. Physics of the Utilization of Solar Energy (4)

Systematics of solar radiation; collectors; heat engines, heat pumps, refrigeration, thermodynamics; machines/systems using low-grade heat; classical heat transfer; thermal superconductors; energy storage; photovoltaic effect; miscellaneous topics and applications. *Prerequisites: Phys. 140A-B or equivalent, elementary quantum physics.* (Not offered in 1980-81.) (S)

160. Survey of Astronomy and Astrophysics (4)

Introduction to modern astronomy and astrophysics. Three hours' lecture. *Prerequisite: Phys. 110A.* (F)

161. Astrophysics (4)

The physics of stars, interstellar matter, and stellar systems. Three hours' lecture. *Prerequisites: Phys. 130A, 160.* (W)

162. Astrophysics (4)

Continuation of Physics 161. Three hours' lecture. *Prerequisites: Phys. 130B, 140B, 161.* (S)

170. Advanced Laboratory (2)

Experimental study of a special problem in optics, cryogenics, resonance physics, nuclear physics, etc., using existing apparatus or developing new apparatus, or both. Hours by arrangement. *Prerequisite: Phys. 131 or 132.* (Not offered in 1980-81.) (S)

171. Advanced Electronic Laboratory (4)

Electrical networks, vacuum tube and solid-state electronics, analysis and design, and components. Power supplies. Amplifiers, noise and feedback, oscillators, digital and logic circuits, microwaves and special topics. Emphasis on applications to physical research. Six hours. *Prerequisite: consent of instructor.* (Not offered in 1980-81.) (F)

180. The Physics of Music (4)

Acoustics, mechanical production of sound (musical instruments, auditorium design); high-fidelity reproduction (linear transducers and amplifiers, recording and playback devices); electronic production of sound (non-linear amplifiers, sound synthesizers). Three hours' lecture. *Prerequisites: freshman calculus, mechanics, electricity and magnetism.* (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.* (Not offered in 1980-81.) (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 (4)

Lagrangian mechanics with application to linear and non-linear motion in inertial and non-inertial frames. (F)

200B. Theoretical Mechanics (3)

Variational principles, Hamilton's equations and Hamilton-Jacobi theory, Special relativity, Rigid body and continuum mechanics. *Prerequisite: Phys. 200A.* (W)

203A. Advanced Classical Electrodynamics (3)

The boundary value problems of electrostatics and the electrostatics of macroscopic media, magnetostatics and the properties of magnetic materials, currents in extended media, macroscopic properties of superconductors, electromagnetic induction and quasi-static phenomena. Maxwell theory and wave propagation. *Prerequisite: Phys. 100C or equivalent.* (F)

203B. Advanced Classical Electrodynamics (4)

Application of Maxwell's equations to radiating systems and boundary value problems, such as wave guides and diffraction phenomena; relativistic electrodynamics, radiation by moving charges; classical electron theory, non-linear phenomena. *Prerequisites: Phys. 100C or equivalent, Phys. 203A.* (S)

206. Topics in Biophysics and Physical Biochemistry (3)

Application of physical methods to biochemistry, e.g., X-ray diffraction, optical rotary dispersion and circular dichroism, magnetic resonance. (Same as Chemistry 206.) *Prerequisite: consent of instructor.* (S/U grades permitted.) (W)

210A-B. Statistical Mechanics (3-3)

Systems of weakly interacting elements, ensemble theory, applications to gases, plasmas, and liquids; elements of theory of phase transitions, fluctuations and non-equilibrium processes. *Prerequisites: Phys. 140A-B, 152 or equivalent, Phys. 212B.* (F,W)

211. Solid-State Physics (4)

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.* (S)

212A-B. Quantum Mechanics (4-4)

Physical basis of quantum mechanics, the Schrödinger equation and the quantum mechanics of one-particle system, matrices and the transformation theory of quantum mechanics, approximation methods for discrete stationary states, translational and rotational invariance, angular momentum and spin, theory of scattering, approximation methods in the continuum and for time-dependent problems and the quantum theory of atomic structure. *Prerequisite: Phys. 130B or equivalent.* (W,S)

212C. Quantum Mechanics (4)

Many-particle systems, second quantization and application to nonrelative many-body problems, relativistic quantum theory. *Prerequisite: Phys. 212B.* (F)

213. Theoretical Nuclear Physics (3)

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)

215. Elementary Particle Physics (3)

An introduction to the elementary particles with particular emphasis on the invariance principles by which they are classified. *Prerequisite: Phys. 212C.* (S)

216. Atomic and Molecular Physics (3)

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)

218A. Plasma Physics (3)

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. (W)

218B. Plasma Physics (3)

This course deals with the magnetized plasma. Topics include: Appleton-Hartree theory of waves in cold plasma, waves in warm plasma (Bernstein waves, cyclotron damping), MHD equations, MHD waves and shocks, MHD theory of equilibrium and stability (interchange instability), adiabatic invariants and drift model of interchange instability, drift waves. *Prerequisite: Phys. 218A.* (S)

219. Introductory Astrophysics (3)

Fundamentals of radiative transfer, theory of gray and non-gray stellar atmospheres; Eddington's approximation, principles of invariance. Formation of absorption lines, curve of growth, resonance radiation. Convection theory. Stellar structure: polytropes, nuclear reactions, stellar models. Stellar evolution. *Prerequisites: Phys. 130C and 140B, or equivalent.* (W)

220. Group Theoretical Methods in Physics (3)

Study of the representations and applications of groups to problems in physics, with particular emphasis on the permutation of unitary groups. *Prerequisite: Phys. 212C.* (S/U grades permitted.) (Not offered in 1980-81.) (F)

221. Advanced Mechanics (3)

Advanced topics such as general relativity, hydrodynamics and shock waves, elasticity. *Prerequisite: Phys. 200B.* (S/U grades permitted.) (Not offered in 1980-81.) (S)

222. Advanced Nuclear Physics (3)

Topics of current interest. Examples: 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.) (Not offered in 1980-81.) (S)

223A. Advanced Astrophysics (3)

Theory and observation of white dwarfs, degenerate matter, interstellar matter, theory and observation of emission lines and continua, thermal energy balance. The Crab Nebula, synchrotron radiations, Fermi acceleration, X-ray, optical and radio flux spectra. Other topics of current interest. *Prerequisite: Phys. 219.* (S/U grades permitted.) (W)

223B. Advanced Astrophysics (3)

Kinematical and dynamical properties of the galaxy; spiral structure; stellar dynamics; masses and rotation of galaxies; theory and observation of galactic nuclei, radiogalaxies; evolution of the universe; observational cosmology, cosmic blackbody radiation; other topics of current interest. *Prerequisite: Phys. 223A.* (S/U grades permitted.) (S)

224. Advanced Quantum Mechanics (3)

Covariant perturbation theory, mass and charge renormalization of quantum electrodynamics, radiative-corrections to scattering and atomic energy levels, introduction to dispersion theory. *Prerequisite: Phys. 212C.* (S/U grades permitted.) (Not offered in 1980-81.) (F)

225A-B. General Relativity and Cosmology (3-2)

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.) (Not offered in 1980-81.) (W,S)

230A. Advanced Solid-State Physics (3)

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.) (F)

230B. Advanced Solid-State Physics (3)

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.) (W)

231. Collision Theory (3)

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)

232. Advanced Plasma Physics (3)

An advanced course treating topics of current research interest, such as: weak turbulence theory, fusion, diagnostic techniques, etc. *Prerequisites: Phys. 218A-B.* (S/U grades permitted.) (F)

233. Elementary Particle Theory (4)

Current problems in elementary particle theory, especially the theory of strong interactions. *Prerequisite: Phys. 215.* (S/U grades permitted.) (F)

234. High-Energy Experimental Physics (4)

Current elementary particles research. Techniques used in experiments with high-energy accelerators. *Prerequisite: Phys. 215.* (S/U grades permitted.) (Not offered in 1980-81.) (S)

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 (1-2)

From time to time, it will be possible to give a self-contained short course on an advanced topic in special areas of research. (S/U grades permitted.)

250. Solid-State and Cryogenics Physics Seminar (0-1)

Discussions of current research in solid-state physics. (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.) (F,W,S)

255. Theoretical Solid-State Seminar (0-1)

Discussions of current research in theoretical solid-state physics. (S/U grades only.) (F,W,S)

256. Experimental Solid-State Physics Seminar (0)

Discussions of current research in experimental solid-state physics and biophysics. (F,W,S)

257. High-Energy Physics Special Topics Seminar (0)

Discussions of current research in high-energy physics. (F,W,S)

258. Astrophysics and Space Physics Special Topics Seminar (0)

Discussions of current research in astrophysics and space physics. (F,W,S)

259. Biophysics Seminar (0)

Discussions of current research in biophysics. (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)

285. Seminar in National Security for Science Students (3)

The course will consist of two parts: first, a presentation of what our national security policy is, and second, a discussion of how various current science and technology programs and policies relate to it. (S/U grades permitted.) (W)

298. Independent Study (1-4)

Prerequisites: consent of instructor and departmental chairman. (S/U grades permitted.) (F,W,S)

299. Research in Physics (1-12)

(S/U grades permitted.) (F,W,S)

PHYSIOLOGY AND PHARMACOLOGY

OFFICE: 1046 Basic Science Building,
School of Medicine

Professors:

Samuel H. Barondes, M.D. (*Psychiatry*)

Kurt Benirschke, M.D. (*Pathology and Reproductive Medicine*)

Eugene F. Bernstein, M.D., Ph.D. (*Surgery*)

Colin M. Bloor, M.D. (*Pathology*)

Theodore H. Bullock, Ph.D. (*Neurosciences*)

James W. Covell, M.D. (*Medicine and Bioengineering, Chairman, Group in Physiology and Pharmacology, 1978-80*)

John W. Evans, M.D., Ph.D. (*Mathematics*)

Darrell D. Fanestil, M.D. (*Medicine*)

Physiology and Pharmacology

- Morris E. Friedkin, Ph.D. (*Biology*)
Arnost Fronek, M.D., Ph.D.
(*Bioengineering*)
Gordon N. Gill, M.D. (*Medicine*)
Mehran Goulian, M.D. (*Medicine*)
Harold T. Hammel, Ph.D. (*Physiology*)
A. F. Hoffman, M.D. (*Medicine*)
Nathan O. Kaplan, Ph.D. (*Chemistry*)
Allen Lein, Ph.D. (*Reproductive
Medicine*)
Arnold J. Mandell, M.D. (*Psychiatry*)
Steven E. Mayer, Ph.D. (*Medicine,
Chairman, Group in Physiology and
Pharmacology, 1976-77*)
John Ross, Jr., M.D. (*Medicine*)
Gordon H. Sato, M.E. (*Biology*)
Stewart Sell, M. D. (*Pathology*)
S. Jonathan Singer, Ph.D. (*Biology*)
Daniel Steinberg, M.D., Ph.D.
(*Medicine*)
Palmer W. Taylor, Ph.D. (*Medicine*)
John B. West, M.D., Ph.D. (*Medicine*)
Henry O. Wheeler, M.D. (*Medicine*)
Fred N. White, Ph.D. (*Medicine*)
Samuel S. C. Yen, M.D. (*Reproductive
Medicine*)
Benjamin W. Zweifach, Ph.D.
(*Bioengineering*)

Associate Professors:

- D. John Faulkner, Ph.D. (*Marine
Chemistry*)
Stanley A. Mendoza, M.D. (*Pediatrics*)
Morton P. Printz, Ph.D. (*Medicine*)
Michael Rosenfeld, M.D. (*Medicine*)
j peter D. Wagner, M.D. (*Medicine*)

Assistant Professors:

- Jack A. Alhadef, Ph.D.
(*Neurosciences*)
I. N. Creese, M.D. (*Neurosciences*)
Guy P. Curtis, M.D., Ph.D. (*Medicine*)
Vincent E. Dionne, Ph.D. (*Medicine*)
G. F. Erickson, M.D. (*Reproductive
Medicine*)
A. J. Hsueh, M.D. (*Reproductive
Medicine*) (*Adjunct*)
Paul A. Insel, M.D. (*Medicine*)

The Graduate Program

The graduate program leads to the Ph.D. degree by study of aspects of the function and metabolism of cells, organs, and organ systems, and also the fundamental mechanisms of action of hormones, neurotransmitters, and drugs, their physiological effects, and their use in better understanding of normal and pathological processes. Students are encouraged to design and execute investigations in a self-critical and indepen-

dent manner and to develop proficiency as teachers. Entrance requirements are flexible. Undergraduate preparation should include courses in calculus, organic chemistry, physical chemistry, and biochemistry, and participation in undergraduate research.

DOCTORAL DEGREE PROGRAM

During the first two years, the student will take basic courses in biochemistry, physiology, endocrinology, the neurosciences, and pharmacology. In a required laboratory rotation program, students develop laboratory skills, the abilities to formulate scientific hypotheses, and become familiar with the research activities of the faculty. Additional course work will depend upon the student's interests and the direction of the thesis project to be selected by the end of the second year of graduate studies.

The graduate program is interdepartmental and interdisciplinary; it involves faculty of the Departments of Biology, Chemistry, Medicine, Neurosciences, Psychiatry, the Bioengineering Group, and Scripps Institution of Oceanography. Research fields that are especially strong are pulmonary, comparative and chemoreceptor physiology, adaptation of temperature and metabolic controls to polar climates, lipid metabolism, and cardiovascular physiology and pharmacology (including the application of bioengineering approaches). Pharmacologic studies of drug action at the molecular and biochemical levels include investigations of the release, fundamental mode of action and inactivation of neurotransmitters, drugs and genetic tools to analyze drug-receptor interaction, and the hormonal control of specialized cells such as adipose and contractile tissues, and tumor cells.

The graduate program in physiology and pharmacology is designed also to educate physician-scientists. The flexibility of this program and that of the School of Medicine permits students admitted to both degree programs to obtain an M.D. and a Ph.D. in about six 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 prop-

osition examination, tests student 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.

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

First-year graduate students take fall-quarter courses in cell biology and biochemistry through the Departments of Biology and Chemistry. Students register for Basic or Advanced Biochemistry (Chemistry 211 or 218) and Human Biochemistry, Chemistry 217. Biology courses in this sequence are Genetics or Advanced Genetics (Biology 254 or 275); Molecular Biology or its advanced component (Biology 253 or 276); Membrane Biology, Biology 274; and Immunology, Biology 255.

See listings under Departments of Biology and Chemistry.

205. Basic Neurology (9)

Interdisciplinary survey of structure, function, chemistry, and pharmacology of normal human nervous system, emphasizing neurological mechanisms underlying development, sensory, and motor capabilities and higher nervous processes. *Prerequisites:* Phys./Pharm. 206 or equivalent, and consent of instructor. (S)

205L. Basic Neurology Laboratory (2)

Interdisciplinary survey of structure, function, chemistry, and pharmacology of the normal human nervous system, emphasizing neurological mechanisms underlying development, sensory, and motor capabilities and higher nervous processes. *Prerequisites:* Phys./Pharm. 206 or equivalent, and consent of instructor. (S)

206. Organ Physiology and Pharmacology (12)

Building on the student's basic knowledge of cellular biology and biochemistry, this course develops fundamental concepts of organ function and relates them to clinical problems. Integrating physiology, pharmacology, and elements of histology, the course examines major organ systems and their interactions in humans. Emphasis is placed on general principles of drug action, fluid balance, and electrolyte metabolism, blood, heart and circulation, respiration, renal function and gastrointestinal function. The mechanism of action of drugs is discussed in the context of each target organ system and in special sections devoted to general pharmacology. Clinical correlation sessions are used to relate physiological and pharmacological principles to clinical situations. The course represents the major time commitment for graduate students in the winter quarter. *Prerequisites:* cell biology and biochemistry or equivalent background in biology and biochemistry. For students not in 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)

209. Endocrinology, Reproduction, and Metabolism (5)

An integrated introduction to the physiology and pharmacology of the endocrine and reproductive systems in humans, followed by a review of metabolic regulations and nutrition. An overview of the endocrine system is presented. Regulation of hormone secretion, mechanisms of hormonal action, and clinical implications are discussed. The basic aspects of the biology of reproduction are covered in detail, including discussion of human embryology, endocrine control, the reproductive cycle, and facets of population dynamics. Finally, metabolic regulation is reviewed, with emphasis on endocrine influences; related nutritional problems are discussed (energy balance, temperature regulation, obesity, diabetes, mellitus, hypercholesterolemia). Pharmacologic agents influencing the endocrine and reproductive systems are reviewed, including the use of hormones as drugs. *Prerequisites: Phys./Pharm. 206 or equivalent, and consent of instructor.* (S)

210. Medical Therapeutics — Pathophysiology (2)

An introduction to the basic mechanisms and therapeutic principles of drug action. The course considers the remaining aspects of therapeutics not considered in OPP.

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 procedures, to system analysis and outline computational methods. *Prerequisites: Phys./Pharm. 206 and 206L and consent of instructor.* (S)

222. Introduction to the Cardiovascular Sciences (1)

An introduction to the basic and clinical sciences pertinent to cardiology. The seminar group will use "heart failure" as a central theme from which to explore biochemistry, physiology, pharmacology, and histology as they relate to the diagnosis and treatment of cardiovascular disease. Open to six to twenty students. *Prerequisites: Phys./Pharm. 206 and the consent of instructor.* (S)

223. Metabolic Basis of Inherited Disease (2)

A brief introductory review of patterns of inheritance and cytogenetics followed by detailed consideration of the biochemical abnormalities and their phenotypic expression as disease. Discussion of biochemical methods for localizing enzyme defects and biological and physiological characterization of disordered metabolism. *Prerequisites: cell biology and biochemistry or consent of instructor.* (S)

224. Advanced Medical Pharmacology and Therapeutics (3)

Three hours of lecture weekly on topics not adequately covered 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, cardiovascular drugs, anesthetics. *Prerequisites: School of Medicine 206 or Phys./Pharm. 206, and consent of instructor.*

226. Respiration Physiology (3)

This course is devoted to aspects of respiratory physiology that are not covered in physiology/pharmacology courses 206 and 206L. These include atmospheric pollutants, comparative physiology of gas exchange, and environmental physiology of respiration, including diving physiology and liquid breathing. *Prerequisite: Phys./Pharm. 206 or School Medicine 206 Medicine 206 or consent of instructor.* (S)

228. Advanced Cardiovascular Physiology (1)

This course 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, in even numbered years.)

229. Molecular and Biochemical Pharmacology (2)

An examination of the molecular and biochemical bases of drug action. The course in the spring quarter is directed towards drug action in relation to intermediary metabolism, mediators of smooth muscle responses, drug metabolism, chemical carcinogenesis, principles of chemotherapy, and selective toxicity. *Prerequisite: course in biochemistry.*

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.*

240. Advanced Physiology (3)

Course will cover aspects of advanced cardiovascular, respiratory, renal and comparative physiology. *Prerequisites: Phys./Pharm. 206 and 206L or School of Medicine 206 and 206L.*

244. Development of Ideas in Physiology and Pharmacology (2)

Course will cover aspects of the development of ideas in physiology and pharmacology.

248. Introduction to Drug Action and Pharmacology (3)

An introductory study of the actions of drugs and chemicals on animals (including humans) in modifying the physiological responses of tissues in isolation and *in situ*. This course is particularly appropriate for students electing a health science or human biology major and as an introductory course for graduate students. *Prerequisite: consent of instructor.* (F)

253. Advanced Renal Physiology and Pharmacology (2)

The course will review renal physiology and pharmacology with an emphasis on mechanism and will examine intensively selected aspects of the subject. The format will be a lecture followed by a seminar. *Prerequisites: School of Medicine 206 and consent of instructor.*

271. Introduction to Cardiovascular Physiology (3)

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. *Prerequisite: consent of instructor.*

272. Introduction to Respiratory Physiology (3)

Broad course in the principles of respiratory physiology including structure-function relationships of the lung, ventilation, diffusion, pulmonary blood flow, pulmonary gas exchange, blood-gas transport, mechanics of breathing, control of respiration, unusual environments, pulmonary function tests. *Prerequisite: consent of instructor.*

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.*

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: Building 412, Warren Campus

Professors:

Wayne A. Cornelius, Ph.D.
Henry W. Ehrmann, Ph.D. (*Visiting*)
*Clifford Grobstein, Ph.D.
‡Sanford A. Lakoff, Ph.D.
Arend Lijphart, Ph.D.
*Roger R. Revelle, Ph.D.
Martin Shapiro, Ph.D.
*Herbert F. York, Ph.D.

Associate Professors:

Peter A. Gourevitch, Ph.D.
Gary C. Jacobson, Ph.D.
Samuel H. Kernell, Ph.D.
David D. Laitin, Ph.D.
Samuel L. Popkin, Ph.D.

Assistant Professors:

Nathaniel L. Beck, Ph.D.
‡Ellen T. Comisso, Ph.D.
Peter F. Cowhey, Ph.D.
Ann L. Craig, Ph.D.
**Robert Meadow, Ph.D. (*Acting Assistant Professor*)
John M. Mendeloff, Ph.D.
Susan L. Shirk, Ph.D.

‡On leave 1980-81

*Affiliated from Program on Science, Technology and Public Affairs

**Affiliated from Communications Program

* * *

The Major Program

The undergraduate major in political science aims to provide both a broad introduction to the discipline and an opportunity for students to pursue topics and areas of study in which they develop a particular interest. The major is especially appropriate undergraduate preparation for subsequent careers in law, government, and public service. Each student enrolled in the program is required to take Political Science 10, 11, and 12, and any twelve upper-division courses approved by a departmental faculty adviser. *Courses taken elsewhere cannot be credited toward the major requirement unless approved by the department on the basis of individual petition.* Candidates for departmental honors are required to take Political Science 191A and B, which may be counted toward the upper-division requirement. **Since the department is in the process of adding faculty and enlarging the list of course offerings, students are strongly advised to consult the department for the latest listing of courses before preregistration.**

Political Science

NOTE: Any of these courses may be used to satisfy the social science component of the Third College general-education requirement under Program B.

Program In United States-Mexican Studies

OFFICE: 402 Warren Campus

Wayne A. Cornelius, Ph.D., Director

This program serves as a national and international center for research, training, and public service activities concerning relations between Mexico and the United States. It deals with the full range of problems and issues affecting these relations (including immigration, trade, energy, foreign investment, technology transfer, environmental and cultural concerns, and public health problems). The program conducts original research, offers research and training fellowships for visiting scholars from Mexico and other U.S. institutions, maintains a research library, sponsors public conferences and other public education activities, and publishes reports on current research bearing on U.S.-Mexican relations. The program also offers an annual seminar on U.S.-Mexican relations (Political Science 189), and provides research assistantships and small research grants to graduate students and advanced undergraduates wishing to conduct independent research in this field.

While based administratively in the Department of Political Science, the program is interdisciplinary in its concerns and approach, and invites the participation of scholars from all disciplines as well as nonacademic specialists from the public and private sectors in the U.S. and Mexico. The program aims to serve as an integrating mechanism and informational clearinghouse for research undertaken at many different sites and as a vehicle for bringing scholars, citizens, and public officials together to examine the salient issues in U.S.-Mexican relations.

The Ph.D. Program

(Administrative Approval Pending). The doctoral program will offer instruction in the four main fields of the discipline: American politics, comparative politics, international relations, and political theory. In addition, the department will offer special programs in Latin America (with emphasis on Mexico), political economy (including public choice theory), science and public policy, and quantitative analysis. Students are expected to

complete two years of study in residence before passing qualifying examinations and advancing to candidacy, then proceed to dissertation writing, which will not normally require more than two additional years.

Courses

Lower Division

10. Introduction to Political Science: American Politics (4)

This course surveys the processes and institutions of American politics. Among the topics discussed are individual political attitudes and values, political participation, voting, parties, interest groups, Congress, presidency, Supreme Court, the federal bureaucracy and domestic and foreign policy-making. Kernell, Jacobson

11. Introduction to Political Science: Comparative Politics (4)

Issues of legitimacy, equality, authority and policy-making will be explored in the context of politics and government in a number of different countries. Cowhey

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.

12. Introduction to Political Science: International Relations (4)

The issues of war/peace, nationalism/internationalism, and economic growth/conservation will be examined in both historical and theoretical perspectives. Laitin

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.

Upper Division

100A-B-C. Systems of Political Thought (4-4-4)

This course treats the development of western political thought from the time of Plato and Aristotle to the modern era. Selected texts will be examined closely, including Plato's *Republic*, Machiavelli's *Prince* and *Discourses*, Hobbes' *Leviathan*, Locke's *Second Treatise on Government* and the writings of Marx and Mill in order to inquire into such topics as the meaning of justice and nature of systematic thinking about politics. Lakoff

101. Comparative Politics (4)

A focus on the problems of stability and democracy in various political systems, on the politics, economics, and ideologies of Western Europe and Communist systems. Comparisons will be drawn between one-party, multi-party, and dictatorial regimes. *Prerequisite: Pol. Sci. 11*

103. China in World Politics (4)

This course will examine many of the major issues in the international relations of Pacific-Asia and in Sino-American relations since the end of World War II. Within the context of such issues the course will analyze Chinese leaders' changing perceptions of the international political system and the way in which they formulate and attempt to carry out their foreign-policy goals. *Prerequisites: junior or senior standing and one course in political science or consent of instructor* (Not offered in 1980-81)

104. British Government and Politics (4)

Examines the nature of parliamentary government in Britain, historical and contemporary perspective. Special attention will be paid to cabinet government, differences between the major parties and trends in social and economic policy. Some attention will also be given to local politics

105A-B. Technology and Society (4-4)

In the first quarter, the focus is on the making of U.S. science policy and the role of scientists in politics. In the second quarter, the theory of post industrial society is examined, along with various policy issues, including the limits to growth controversy and energy policy. Lakoff

105C. Technology and society (4)

This course concentrates on the policy issues raised by biomedical scientific advance. The topical content varies from year to year but includes such areas as fertility control, fertilization *in vitro*, recombinant DNA, life support systems and genetic engineering. Emphasis is placed on necessary mechanisms for interaction of scientific expertise and other perspectives in policy-making. Grobstein

106. Politics in France (4)

This course is an attempt to explain how France has become an increasingly bi-polarized political system. Emphasis will be placed on (1) French "conservative" and "radical" ideologies; (2) French political parties; (3) the institutions of the Fifth Republic with and without deGaulle; (4) French local politics; (5) France in a crisis situation; (6) prospects for the future.

107A-B. Voting, Campaigning and Elections (4-4)

This course will consider the nature of public opinion and voting in American government. Studies of voting behavior will be examined from the viewpoints of both citizens and candidates and an effort will be made to develop models of their electoral behavior. Attention will also be devoted to recent efforts to develop rational choice theories of electoral behavior and to critiques of elections as democratic institutions. The role of the mass media and money also will be examined. *Prerequisite: 107A for 107B*. Popkin (107B not offered in 1980-81.)

108A-B. Politics of Education (4-4)

This course examines a series of controversies over the direction and control of education. American materials, including experience with desegregation and community control, will be stressed, but attention will also be paid to controversies arising in other systems, including modern China, Malaysia, and Nigeria. The second quarter of this course stresses field research. Students will be asked to select a particular problem in connection with schooling and investigate the problem directly, with the supervision of the instructor. *Prerequisite: 108A for 108B*. Shirk (108B not offered in 1980-81.)

109. The Presidency (4)

The role of the presidency in American politics. Topics will include nomination and election politics, relations with congress, party leadership, presidential control of the bureaucracy, international political role and presidential psychology. Kernell

112A-B. Law and Politics — The Supreme Court (4-4)

A two-quarter sequence examining the political role of the Supreme Court and the evolution of constitutional doctrines. (Only the first quarter to be offered this year.) Shapiro

112C. Law and Politics — 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. Ehrmann

112D. Law and Politics — The Urban Courts (4)

An examination of the relation of trial courts to the urban political system; judicial recruitment, the relation of trial courts to appellate courts, police, prosecutors, and defense attorneys, and the panel system. *Prerequisite: lower-division political science or consent of instructor.*

112E. Undergraduate Seminar in Law and Politics (4)

An undergraduate seminar designed to allow students who have already had lecture courses in law and politics to pursue some aspect of those courses in greater depth and in a small group setting. *Prerequisites: Pol. Sci. 112A-B-C-D and consent of instructor.*

112F. Special Topics in Law and Politics (4)

An undergraduate seminar designed to allow students who have already had lecture courses in law and politics to pursue some aspect of those courses in greater depth and in a small group setting. This course is open to students who have had 112E. *Prerequisites: Pol. Sci. 112A-B-C-D-E and consent of instructor.*

112G. Civil Liberties Law (4)

This course examines the conflicts over the interpretation of the Bill of Rights. Supreme court cases will be the main materials examined, but other materials will also be considered, including the work of leading analysts

112H. The Courts and Public Policy (4)

This course will examine the ways public policy is affected by the judicial process, the impact of court-made policy, and the role of the judiciary from a systems theoretical point of view

112J. Topics in Constitutional Law (4)

This course will examine the constitutional policy developments related to the equal protection clause of the fourteenth amendment. The Bakke Case and the Supreme Court Justices' use of the nature of equality in American society will receive extensive analysis.

114A-B. People and Politics (4-4)

This course is about how people learn about politics and why they participate in politics. Among the topics to be treated will be how children learn about politics, why some people participate in politics and some don't, what kinds of personalities are to be found among political leaders and followers, and why people have the political attitudes they do. *Prerequisite: 114A for 114B* Jacobson

115A-B. American Political Parties (4-4)

Examines the development of two major parties as well as third party movements. Considers the nature of party affiliation, the role of leaders, activists, and organizers, and the relation of parties to government and special interest groups. *Prerequisite: 115A for 115B* Jacobson

120. Urban Politics (4)

This course will focus on structures and processes of urban politics, as well as on contemporary issues of urban public policy. Topics to be considered include the nature and development of the metropolitan community, urban politics and decision-making, and policy issues such as criminal justice, civil rights, and planning. (Not offered in 1980-81.)

121. The U.S. Congress (4)

This course will examine the nomination and election of congressmen, constituent relationships, the development of the institution, formal and informal structures, leadership, comparisons of House with Senate, lobbying, and relationship with the executive branch. *Prerequisite: Pol. Sci. 10* Jacobson

122. American Political Development (4)

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. *Prerequisite: Pol. Sci. 10 and 11* Kernell

123. Quantitative Methods for Public Policy (4)

This course deals with several quantitative techniques that are used in actual policy research, including optimization, computer simulation and mathematical modelling. Students will undertake various exercises. There is no mathematical prerequisite for the course. Beck

124A. 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 analysts and policymakers often use. Mendeloff

124B-C. Research in Policy Analysis (4-4)

124B will emphasize the political and organizational problems of designing and implementing public policies. Students will carry out several analyses of policies. 124C will provide opportunities for students to work on internships. Students will be graded separately for each quarter. *Prerequisites: 124A for 124B, 124B for 124C* Beck/Mendeloff

127. Applied Statistics for Public Policy and Political Science (4)

Applications of statistical methodology including survey research and experimental design to some common political problems. Some attention will be given to political uses of forecasting. Each student will undertake some applied project. *Prerequisite: one course in statistics* Beck

131. Selected Topics in Latin American Politics (4)

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.

132. Politics in the People's Republic of China (4)

This course will study post-1949 China as a country which has experimented broadly with economic, social, and political problems confronted in their attempt to build a modernized society based on revolutionary ideals. Shirk

133A. Vietnam: The Politics of the Village (4)

This first unit of a two-quarter sequence will discuss the nature of Vietnamese society, especially its village structure, but also its religious, ethnic and class divisions. Popkin

133B. Vietnam: The Politics of Intervention (4)

The second unit of the sequence will examine the intervention of foreign powers in Vietnam (including France, the United States, China, and the Soviet Union) and the effects of intervention. *Prerequisites: 133A and consent of instructor* (Not offered in 1980-81.) Popkin

133C. Vietnam: Special Topics in the Study of Revolution (4)

An intensive examination of selected theoretical issues in the study of the political economy of revolution and counter-revolution. *Prerequisite: consent of instructor*. Popkin

134. Seminar — Chinese Politics (4)

This course will examine selected topics concerning major problems of political institutions, political participation, and social change in post-revolutionary China. These topics will be related to a general examination of Maoism and to general scholarly critiques of post-revolutionary political development. *Prerequisite: Pol. Sci. 132 or equivalent*. Shirk

136. Political Development of Europe (4)

The origins of the modern state examined through case study of the major conflicts shaping the European systems (the commercialization of agriculture, the church, the army and state bureaucracy, and industrialization); consideration of alternative paradigms and theorists, especially Marx, Weber and Tocqueville. (Not offered in 1980-81) Gourevitch

139. Political Modernization Theory (4)

A survey of approaches to the study of modernization. Processes of the development of capitalism, industrialization and urbanization will be examined. The way in which these processes affect mobilization, incorporation, assimilation, legitimacy and the institutionalization of political regimes will be studied. Laitin

141A-B. Soviet Politics (4-4)

This course will examine the goals of socialist society and various strategies proposed to achieve them in the context of the Soviet Union. Thus, we will examine Soviet development and politics as a product of the choices Soviet leaders have made, examining why those choices were made and with what results. The particular aspects of Soviet politics which will be emphasized are economic and social policy, human rights, nationality relations, and foreign policy. *Prerequisite: Pol. Sci. 141A for 141B* Comisso

142A-B. Comparative Communism (4-4)

This course will examine the theory and practice of Marxist-Leninist movements outside of the Soviet Union. After a brief analysis of some of the major socialist theorists, several communist parties and socialist systems will be examined in terms of their empirical practice. Differences in the role of government, the nature of the party, the impact of the Soviet experience, the importance of national traditions, the structure of the economy and the organization of producer groups will be explored. The first quarter will concentrate on Marxist-Leninist movements and regimes in advanced industrial countries, the second quarter will focus on communism in the Third World. *Prerequisite: Pol. Sci. 141A-B, 142A for 142B* Comisso

144. African Politics (4)

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. (Not offered in 1980-81.)

151. Topics in American International Relations (4)

This course will examine post-World War II American international relations in selected geographical and issue areas. The approach will include analysis and evaluation of specific American policies toward the selected areas and analysis of the internal process of foreign policy decision-making.

152. American Foreign Policy (4)

American foreign policy as directed to our allies, our adversaries and to neutrals, and concerning energy and ecology as well as more traditional issues — will be critically analyzed. Analysis will center on questions of purposes, interests, and political responsibility. General theories of American foreign policy, both conventional and radical, will also be discussed.

153. International Organization (4)

Three independent themes will be explored: (1) the prospects for, and an evaluation of, world government, (2) the purposes of international organizations of more limited scope than world

government, and the implications of these organizations for future world reorganization based on current social, economic, ecological and political trends. (Not offered in 1980-81.)

154. Comparative Politics and Political Culture (4)

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: consent of instructor* Laitin

155A-B. Politics and the Economic Order (4-4)

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 nation-state and its implications for economic arrangements. 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. *Prerequisites: 115A-Pol. Sci. 12 and one quarter of economics; 155B-Pol. Sci. 155A* Cowhey

156. The Policy Making Process (4)

This course will describe the policy-making processes employed by American national government. Attention will be focused on the law-making process and on decision making within the executive branch. (Not offered in 1980-81.)

158. Social Welfare Policies in Industrialized Countries (4)

What explains the differences in income assistance, health care and other types of social welfare policies among Western Countries? Do some types of welfare programs work better than others? Can the U.S. learn important lessons from other countries' experiences with social welfare policies? These questions will serve as organizing themes for this course. (Not offered in 1980-81.)

159. Energy Policy and Politics (4)

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. Cowhey

161. Marine Policy (4)

This course aims to provide a theoretical and factual framework for the study of marine policy and to examine four or five 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. Revelle

162. Bureaucracy, Modernization and Development (4)

This course examines the role of public administrative bureaucracy in the developing nations from two perspectives: first, the assumption that a formal, modern bureaucracy is the example par excellence of rational organization and that the presence of such an organization is evidence of modernization, and second, the role of bureaucracy as an instrument of development.

163. Seminar — Special Topics in American Politics (4)

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: Pol. Sci. 10 and two upper division classes in American politics* (Not offered in 1980-81.) Kernell

164. Political Consequences of Electoral Systems (4)

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. Lipphart

165. Seminar: Advanced Topics in Comparative Politics (4)

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. (Not offered in 1980-81.) Lijphart

166. Policies for Saving Lives (4)

The course will review the causes of mortality and morbidity in the U.S. and examine how government resources are deployed against them. On what basis should resources in this area be allocated? What are the political prospects for improvements? Mendeloff.

167A-B. Democracy in Plural Societies (4-4)

This course examines the problem of creating and maintaining stable democratic regimes in societies divided by major cleavages such as those of religion, ethnicity, and language. The theoretical model of "consociational democracy" will be explained and applied to explain experience in a variety of national settings, including Holland, Belgium, Switzerland, Canada and Lebanon, as well as Third World cases. *Prerequisite: Pol. Sci. 167A for 167B or consent of instructor.* Lijphart.

168. Political Forms in the Twentieth Century: Fascism and Constitutional Democracy (4)

An exploration of the origins and character of Fascism and Constitutional Democracy in the Twentieth Century. Stress on the impact of policy quarrels over economic and military crises upon political struggles concerning the distribution of power and political freedoms. Gourevitch

169. Comparative Responses to International Economic Crises (4)

What political factors shape the choice among alternative policies for coping with such economic problems as inflation, unemployment, balance of payments deficits, industrial and agricultural modernization and foreign competition in the period after World War II? What consequences does the choice of policy instrument have for the political system, liberty, prosperity, international peace and other values? Stress on the industrialized countries of Western Europe, North America and Japan. *Prerequisites: Pol. Sci. 168 or consent of instructor.* Gourevitch

170. American National Security Policy (4)

A course about U.S. national security objectives and the means for achieving them. Special emphasis will be placed on current U.S. military posture and arms-control policies, and the rationales behind them. Topics will include the strategic balance, the NATO/Warsaw Pact confrontations, the Middle East, SALT, and other arms control forums.

171. Seminar: American National Security Policy (4)

Seminar in selected national security topics. Special emphasis will be placed on current U.S. military posture and arms control policies, and the rationales behind them. Other topics will include the strategic balance, the NATO/Warsaw Pact confrontations, the Middle East, SALT, and other arms control forums. *Prerequisite: Pol. Sci. STPA 170.*

172. Economic Theories of Political Behavior (4)

An introduction to theories of political behavior developed with the assumptions and methods of economics. General emphasis will be upon theories linking individual behavior to institutional patterns. Specific topics to be covered will include collective action, leadership, voting and bargaining. Popkin

173. Positive Political Theory (4)

The course is intended to acquaint undergraduates with a wide variety of mathematical models used in political science. The approach will be non-technical. The goal of the course is to give the student an understanding of the utility of such models for the study of political phenomena. Beck

174A-B. Statistical Methods/Data Analysis (4)

This course will offer a general introduction to statistical methods and data analysis for students interested in political science, public policy, and communications research. Although calculus is not required, it is strongly recommended. The course will include a basic introduction to the 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 such as SPSS and each student will do a large scale analysis project during the second half of the course. (Not offered in 1980-81.) Beck

175A. Fundamentals of Political Economy (4)

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. Comisso

175B. Issues in Political Economy (4)

The second half of this two-quarter course will be a seminar, dealing in depth with one or a number of specific issues touched on in the first half of the course (175A) and dealt with in 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: Pol. Sci. 175A.* Comisso

176. Politics of American Economic Policy (4)

This course examines the impact of politics on American postwar economic policy-making. The course will examine both political institutions that affect economic policy and specific cases of politico-economic decision-making. A paper examining one topic in detail is required. *Prerequisite: Econ. 1B or equivalent.* Beck

177. The Politics and Economics of Regulatory Reform (4)

This course will examine both social regulations (e.g. environmental protection) and industry regulation (e.g. the airlines and trucking). For the former, the focus will be on feasible steps to introduce more market-like incentives. For the latter, the focus will be on attempts to buy off potential losers (and thus opponents) to better policies. *Prerequisite: Econ. 1C.* Mendeloff.

178. Comparative Systems of Propaganda (4)

This course will examine the creation and dissemination of propaganda across a variety of social and political systems. Differences in system building or maintaining communication processes between variant ideologies or cultures such as East and West, socialist and capitalist, and industrialized and non-industrialized nations will be considered. Selected propaganda campaigns will be examined in detail. *Prerequisite: consent of instructor.* Meadow.

179. Mass Media and Politics (4)

This course will explore both the role played by mass media in political institutions, processes and behaviors, and reciprocally, the roles played by political systems in guiding communication processes and technologies. Four major topics will be considered: 1. Mass media and political socialization. 2. News gathering and dissemination. 3. Mass media in electoral politics. 4. Communication as a political issue. Meadow.

182. Content Analysis (4)

This is a methods course designed as an introduction to content analysis; the scientific, systematic and objective employed in verbal and non-verbal message analysis. Although content analysis is used throughout the social sciences and humanities, examples will be drawn primarily from political speeches, documents and news media. Students will engage in original content analysis research projects during the quarter. Meadow.

183. Mexico: The Politics of Development and Underdevelopment (4)

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 poor, students and intellectuals, etc.). Central organizing questions are: 1. To what extent is the Mexican political system responsible for the developmental pattern of Mexico since 1940 (rapid economic growth, highly uneven distribution of the benefits of economic development)? 2. Why has the Mexican regime remained relatively stable, despite occasional conflicts with private-sector elites and widespread poverty, underemployment, and social inequality generated by the regime's preferred development strategy? Cornelius

184. Seminar: The Political Economy of International Labor Migration (4)

A comparative survey of worker migration from Third World countries to industrialized or 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, char-

acteristics 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.* Cornelius.

185. The U.S. and Latin America: Political and Economic Relations (4)

Two central issues in U.S. relations with Latin America will be explored: 1. U.S. policies toward revolutionary and authoritarian regimes in the region. 2. Changes in Latin American economic dependence on official aid and private investments from the U.S. These issues will be studied in historical perspective, looking toward policy issues for the 1980s and also at current problems in U.S. relations with two or three selected Latin American countries. Craig

186. Peasant Movements and Agrarian Problems in Latin America (4)

This course examines the political and economic problems confronting peasants in Latin America: when, 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 responses to the capitalization of agriculture in two or three countries. Craig

187A-B. Comparative Politics of Latin America (4-4)

Comparative analysis of contemporary political systems and developmental profiles of selected Latin American countries, with special reference to the ways in which revolutionary and counter-revolutionary movements have affected the political, economic, and social structures observable in these countries today. Analyzes the performance of "revolutionary" governments in dealing with problems of domestic political management, reducing external economic dependency, redistributing wealth, creating employment, and extending social services. Intensive study of Mexico, Peru, Chile, Cuba, and Nicaragua, particularly in second quarter; introduction to general theoretical works on Latin American politics and development. *Prerequisite: 187A for 187B.* Craig

188. The Political Economy of Urbanization (4)

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 rechanneling 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: consent of instructor.* (Not offered in 1980-81.) Cornelius

189. Seminar on United States-Mexican Relations (4)

Explores the fundamental sources of conflict and convergence between Mexico and the United States, as well as current policy issues affecting bilateral relations (undocumented migration to the U.S., trade protectionism, U.S. access to Mexican energy supplies, "border management" problems). Determinants and consequences of U.S. and Mexican government policies toward each other; long-term changes in the economies, societies, and political systems of Mexico and the U.S. which affect bilateral relations. *Prerequisite: consent of instructor.* Cornelius

190. Politics of Rural Inequality (4)

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. Craig

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, G.P.A. of 3.5 in political science or consent of the department Faculty.

197. Field Study in Political Science (4)

Field work in the local area in some aspect 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. (F.W.S)

198. Directed Group Study (2 or 4)

Directed group study in an area not presently covered by the departmental curriculum (P/NP grades only.) (F.W.S)

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. (F.W.S)

298. Directed Reading (1-12)

Guided and supervised reading in the literature of the several fields of political science. *Prerequisite:* graduate standing (F.W.S)

PSYCHOLOGY

OFFICE: 5217 Psychology-Linguistics Building, Muir College

Professors:

Norman H. Anderson, Ph.D.
Robert M. Boynton, Ph.D.
Michael Cole, Ph.D.
J. Anthony Deutsch, D. Phil.
Edmund J. Fantino, Ph.D.
George Mandler, Ph.D.
Jean M. Mandler, Ph.D.
Donald A. Norman, Ph.D.
George S. Reynolds, Ph.D. (*Chairman*)
David E. Rumelhart, Ph.D.

Associate Professors:

Ebbe N. Ebbesen, Ph.D.
Vladimir J. Konečni, Ph.D.
Donald I. A. MacLeod, Ph.D.
Harry L. Munsinger, Ph.D.
Ben A. Williams, Ph.D.

Assistant Professors:

Carol M. Cicerone, Ph.D.
James A. Kulik, Ph.D.
James L. McClelland, Ph.D.
Jeffrey O. Miller, Ph.D.

* * *

Ursula Bellugi, Ed.D., (*Adjunct Professor of Psychology*)

Robert Galambos, Ph.D., M.D., (*Professor of Neurosciences*)

Steven A. Hillyard, Ph.D., (*Associate Professor of Neurosciences*)

Larry R. Squire, Ph.D. (*Associate Professor of Psychiatry*)

* * *

The Undergraduate Program**The Major Program**

The department offers courses in all major areas of experimental psychology, with emphasis in the areas of human information processing, sensation and perception, learning and motivation, physiological psychology, developmental psychology, and social psychology. The department emphasizes modern 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.

The department offers a flexible program of study towards the B.A. degree. Several different options are available to the student, from a general curriculum which allows for diversity of studies to a specialized curriculum which allows the student to explore a limited number of topic areas in great depth. An honors program — requiring laboratory courses and a year-long individual research project — is also available to students. The honors program is specifically designed for students interested in preparing for graduate or professional school. The more general curricula are available to students who do not plan to continue studies beyond the B.A. degree.

Prerequisites for Psychology Majors

Experimental psychology uses the tools and knowledge of science: calculus, probability theory, computer science, chemistry, biology, 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. The student has completed the prerequisites for the psychology major, which are (a) three quarters of science other than psychology; (b) three quarters of university-level mathematics; (c) introductory psychology (Psychology 1 at UC San Diego, or equivalent); and (d) introduction to computer

programming (EECS 61 or AMES 10 at UC San Diego, or equivalent). The student is encouraged to complete these requirements by the end of the sophomore year if possible. All of these courses except Psychology 1 may be taken Pass/No Pass.

2. The student has completed one quarter of statistics (Psychology 60 or Mathematics 80A, or equivalent).
3. The student has completed any twelve upper-division courses in psychology. Advanced statistics (Psychology III or an equivalent from another department) may be included in the twelve courses.

Psychology 199 cannot 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 UC San Diego.

A major consideration in deciding the specific program one will pursue are the prerequisites of the various upper-division psychology classes taught by the department. The student should note the prerequisites for *all* of the classes he or she might be interested in taking. It is important to take those classes which are prerequisites for many others early in one's program. For example, students are well advised to take Introduction to Statistics (60) in their sophomore year, or sooner, as it is a prerequisite for many other psychology classes. Similarly, many of the classes which serve as introductions to the various areas of psychology (e.g., Introduction to Sensation and Perception, and Introduction to Social Psychology) are prerequisites for more advanced courses in those areas. Therefore, these classes should also be taken early in one's college career.

Advising

All students majoring in psychology are assigned a faculty member as a permanent advisor. Such assignment occurs at the main department office (P&L 5217) 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 to insure that ample time is available to satisfy the necessary prerequisites for the courses taught in the department.

Alternative Programs of Study

Students may wish to obtain a general overview of experimental psychology, or they might wish to have more intensive exposure to one or more areas of specialization within experimental psychology. To aid the student's selection, the courses falling within particular areas of specialization are listed below. Note that students wishing to specialize in an area need not take all of the courses listed under that area. Groupings of courses are presented only to show which courses are most pertinent to each specialty area.

Students interested in a general background in experimental psychology should consider the following courses:

- Introduction to Statistics (60)
- Introduction to Developmental Psychology (101)
- Introduction to Sensation and Perception (102)
- Introduction to the Principles of Behavior (103)
- Introduction to Social Psychology (104)
- Introduction to Cognitive Psychology (105)
- Introduction to Physiological Psychology (106)
- Viewpoints in Experimental Psychology (108)
- Explanation and Knowledge (165)
- History of Psychology (166)

in addition to other upper-division psychology electives which might be of particular interest to the student.

A student interested in specializing in human development should consider the following courses:

- Introduction to Statistics (60)
- Introduction to Developmental Psychology (101)
- Cognitive Development: Piaget (136)
- Psycholinguistics (145)
- Abnormal Psychology (163)

as well as other electives of interest.

Since development occurs in all sub-areas, students interested in development would do well to take as many of the following as possible:

- Introduction to Sensation and Perception (102)
- Introduction to the Principles of Behavior (103)
- Introduction to Social Psychology (104)
- Introduction to Cognitive Psychology (105)

Introduction to Physiological Psychology (106)

A student interested in specializing in social psychology should consider the following courses:

- Introduction to Statistics (60)
- Introduction to Social Psychology (104)
- Advanced Statistics (111)
- Experimental Methods in Social Psychology (126)
- Methods in Applied Social Psychology (127)
- Emotion (143)
- Culture and Thought (146)
- Social Perception and Cognition (147)
- The Psychology of Judgment (148)
- Human Aggressive Behavior (161)

as well as other electives of interest.

A student interested in specializing in cognitive psychology should consider the following courses:

- Introduction to Statistics (60)
- Introduction to Sensation and Perception (102)
- Introduction to Cognitive Psychology (105)
- Advanced Statistics (111)
- Laboratory in Cognitive Psychology (115)
- Psychology and Artificial Intelligence (133)
- Psychology of Thinking (134)
- Cognitive Development: Piaget (136)
- Cognition and the Brain (137)
- Psycholinguistics (145)
- Culture and Thought (146)
- Social Perception and Cognition (147)
- The Psychology of Judgment (148)

as well as other electives of interest.

A student interested in specializing in sensation and perception should consider the following courses:

- Introduction to Statistics (60)
- Introduction to Sensation and Perception (102)
- Introduction to Cognitive Psychology (105)
- Laboratory in Sensory Psychology (116)
- Physiological Basis of Perception (159)

as well as other electives of interest.

A student interested in specializing in learning and motivation should consider the following courses:

- Introduction to Statistics (60)
- Introduction to the Principles of Behavior (103)
- Learning and Motivation (120)

Laboratory in Learning and Motivation (121)

Comparative Psychology (150)
Control of Human Behavior (151)

as well as other electives of interest.

A student interested in specializing in physiological psychology should consider the following courses:

- Introduction to Statistics (60)
- Introduction to Sensation and Perception (102)
- Introduction to Physiological Psychology (106)
- Laboratory in Sensory Psychology (116)
- Cognition and the Brain (137)
- Comparative Psychology (150)
- Physiological Basis of Perception (159)

in addition to other electives of interest.

Honors Program

Students are encouraged to participate in the departmental honors program. The major feature of the program is a year-long independent research project (194) done in the student's senior year which results in an honors thesis. The honors project normally will be under the supervision of a faculty member in the Department of Psychology. In preparation for such a project the honors candidate must take:

- Introduction to Statistics (60)
- Advanced Statistics (111)
- Any Methods or Laboratory Course (115, 116, 121, 126, 127).

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.

Undergraduate Program in Cognitive Science

Starting in the 1980-81 academic year there will be a major program in cognitive science. Students interested should consult the department.

Going to Graduate School?

A major factor in selection of applicants to graduate school is research experience. This is true for all fields of psychology, from experimental to clinical. Students who think they might wish to pursue graduate training should consider their courses in this light. Most relevant are the laboratory courses, the courses in statistics, and the independent research courses (194A-B-C, 199).

The College Science and Mathematics Requirements

Each college imposes its own science and mathematics requirement upon its students. A student who wishes to major in psychology must also fulfill the special prerequisites listed above. These science and mathematics prerequisites are automatically met by the Revelle College requirements. Muir College and Third College students will have to take one year of mathematics, as well as the required number of science courses from the ones offered to them. Warren College students will also have to take one year of mathematics as well as the required number of science courses.

THE MINOR PROGRAMS

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. One of the lower-division courses must be Psychology 1. 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 for 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. The first course of the minor sequence must be Psychology 1. 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 conforming to the following rules: (a) the first course must be Psychology 1; (b) at least three of the six courses must be upper-division; (c) upper-division courses may be selected from any of those listed in section on alternative programs of study.

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 exceptions may be made for applicants with good backgrounds in such fields as biology and mathematics.

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 UC San Diego. 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.

First-Year Requirements

In the first year of study, each student must fulfill the following 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 at least eight courses from the list prepared by the graduate affairs committee. At least five of these must be basic courses from at least four different areas. During the year of study, the student is required to complete five of these courses, four of which must be basic seminars. By the end of the second year the student must have completed at least five basic seminars in four different areas. The graduate committee will provide a list of acceptable courses and a list of the areas.
3. All first-year graduate students are required to submit a research paper on the project completed as a part of their 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 format of the paper should be in the style of a journal article acceptable to any of the major journals in the student's area (the publication manual of the American Psychological Association, second edition, 1974, should be followed.)
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 affairs committee. The paper will be graded on a three point scale: +, 0, and -. Additional readers may be required when there are conflicting evaluations.

The research paper is presented orally also at a research meeting held at the end of the spring quarter. Attendance at this meeting is required of the entire 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. Students are evaluated by the entire faculty by a meeting at the end of the academic year. At the department evaluation, 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 the courses which fulfill the area requirements.

Qualifying Examination for the Ph.D. Degree

The qualifying examination has two parts. In one part, the student is examined on topics related to the thesis proposal. In the other, the student is examined on a broader range of topics. This broader range of topics is determined jointly by the student and the qualifying committee. Prior to the examination, the student submits to the committee a written list of the four areas in the department in which the student is qualified and a list of topics in those areas on which the student wishes to be examined. The student and the committee work together to reach a mutually satisfactory document that lists the topics to be covered. Then, at the time of the examination, a definite period of time is set aside for questions on these topics.

These regulations took effect on the first day of classes in the 1975-76 academic year (September 19, 1975). All students are required to follow the new program, except that those students who have already passed the written qualifying examination are allowed to follow the old requirement (the qualifying examination will consist only of questions on the area of thesis proposal itself).

Teaching

All students are required to participate in the teaching activities of the department for one quarter of half-time teaching every year for four years.

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

From the first year of graduate study all students are enrolled in a research practicum (Psychology 296). Students are assigned to current research projects in the department, and receive the personal supervision of a member of the staff.

Courses

Lower Division

Experimental Requirements

Psychology at UC San Diego 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 (with the exception of Psychology 60) 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 with alternate service assignments which are designed to serve similar educational goals.

1. Psychology (4)

An introduction to basic concepts in psychology. (F.W.S)

10. Developmental Psychology (4)

An introduction to the psychological development of the human organism with special reference to cognitive development in the child.

11. Perception and Information Processing (4)

An introduction to basic principles of perception, learning, and information processing.

14. Social Psychology Applied to Human Problems (4)

An introduction to concepts and methods in social psychology.

19. Introduction to Personality (4)

An introductory course in personality designed for students with a minimal background in psychology. The course topics of general interest in personality theory and research.

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.*

88. Learning Skills (4)

An experimental seminar on the development of skills for learning. We will talk about how to analyze learning strategies, how to remember, how to plan, and how to analyze a task. We will cover analysis of "bugs" in a solution and the development of appropriate "debugging" strategies. (Not offered in 1980-81.)

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 the 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.

108. Introduction to Experimental Psychology (4)

Various members of the psychology faculty will discuss their current research with special emphasis upon methodological problems. (Not offered in 1980-81.)

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 Math. 80A.*

115. Laboratory in Cognitive Psychology (4)

Lecture and laboratory work in human information processing. *Prerequisites: Psych. 105 and 111 and 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: Co-registration with Psych. 121.*

121. Laboratory in Operant Psychology (4)

Lecture and laboratory in operant psychology. *Prerequisite: must be taken with Psych. 120.*

126. Experimental Methods in Social Psychology (4)

Lecture and laboratory work in social psychology. *Prerequisites: Psych. 104 and 111, or equivalent.*

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.*

130. Developmental Psychology and Education (4)

An introduction to cognitive development with emphasis on its relation to education. *Prerequisites: enrollment in Teacher Education Program or consent of instructor.*

133. Psychology and Artificial Intelligence (4)

A survey of current developments in artificial intelligence as it pertains to psychology. Special attention will be given to work in automatic speech understanding, natural language processing, belief systems, problem solving and game playing. *Prerequisites: Psych. 105 and EECS61.*

134. Psychology of Thinking (4)

An introduction to contemporary models of cognition and the process of thinking. *Prerequisite: Psych. 105.* (Not offered in 1980-81.)

136. Cognitive Development: Piaget (4)

Intensive examination of Jean Piaget's theories of cognitive growth from birth to adolescence. Topics: development of imagery and mental representation, thought and language, concepts of space, causality and number, logical thinking. *Prerequisite: Psych. 101 or 105.*

137. Cognition and the Brain (4)

An examination of the relationship between higher mental function and neurology in a developmental/adaptive framework. This will include the classical literature on neurological disorders in adults and children. Theories and mechanisms will be discussed in an attempt to elucidate structural and functional relations between cognitive processes and the brain. *Prerequisites: two of the following: Psych. 101, 105, 106 or graduate standing.*

138. Alcohol and Its Problems (4)

The following areas will be studied: psychopharmacology, neuropharmacology and biochemical pharmacology of alcohol; fetal alcohol syndrome; alcohol addiction and animal models; social psychology of alcohol; problems of controls of alcoholism; and interactions with alcoholics.

143. Emotion (4)

Introduction to current theories and research on emotion, with special reference to theories of anxiety. *Prerequisite: Psych. 105 or 104.*

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. *Prerequisites: Psych. 105 or Ling. 1 and 2.*

146. Culture and Thought (4)

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 upon 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. *Prerequisites: Communications 100B or consent of instructor.*

147. Social Perception and Cognition (4)

How we perceive and judge other persons and ourselves. Focus on experimental analysis of cognitive processes. *Prerequisites: Psych. 104 and 105.*

148. The Psychology of Judgment (4)

General theory of judgment based on cognitive algebra. Applications across many areas of psychology, including psychophysics, decision making, cognitive and social psychology. *Prerequisite: senior honors standing; for students planning on graduate study.* (Not offered in 1980-81.)

150. Comparative Psychology (4)

Principal emphasis will be on the comparative psychology of learning and ethology. Selected topics such as critical periods and animal communication will be covered. *Prerequisite: Psych. 103 or 106* (Not offered in 1980-81.)

151. Control and Analysis of Human Behavior (4)

Extensions of learning principles to human behavior. Topics include methods of self-control, applications to clinical disorders, and the design of cultures. *Prerequisite: Psych. 120.*

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.*

161. Human Aggressive Behavior (4)

Influential theories of human aggression will be reviewed in detail. Classical and recent studies in the area will be examined, with an emphasis on methodological and definitional issues. An integrated cognitive-emotional model of interpersonal aggression will be developed. *Prerequisite: Psych. 104 or consent of instructor.*

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, socio-cultural 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.*

170. Critical Issues in Psychology (4)

Discussion of selected controversial issues (e.g., nature of intelligence, nature of motivation) from alternative theoretical perspectives. *Prerequisites: restricted to senior psychology majors with consent of instructor.* (Not offered in 1980-81.)

171. Disorders of Communications (4)

This course is an introductory survey of miscommunication, both verbal and nonverbal. It focuses on, although is not restricted to, forms of miscommunication that are labeled pathological, e.g., schizophrenia, aphasia, and childhood autism. Investigation of these problems takes several perspectives. Pathological forms of communication are discussed in communications theory, cognitive and behavioral science terms. Both the situational nature of communication disorders and their development within a given individual are discussed. In addition, a socio-historical perspective is taken on the development of prevailing concepts concerning pathological forms of communication (a micro/macro communications course.) *Prerequisites: Communications 100A-B-C or consent of instructor.*

173. Literacy, Social Organization, and the Individual (4)

This course will examine the historical growth of literacy from its earliest precursors in the Near East. The interrelation between literate technology and social organization and the impact of literacy on the individual will be twin foci of the course. Arriving at the modern era, the course will examine such questions as the impediments to teaching, reading, and writing skills to all normal children in technological societies and the relation between literacy and national development in the Third World. *Prerequisites: Communications 100C or consent of instructor.*

179. Drugs, Addiction, and Mental Disorder (4)

The course concerns the effects of drug and abnormal chemical states on mental functioning and behavior. Lectures will be concerned with the neuronal basis of drug effects, human drug abuse and its causes, animal models and biochemical bases of human neurosis and psychosis.

194A-B-C. Honors Thesis (4-4-4)

Research seminars and research, under the direction of a member of the staff. *Prerequisites: one laboratory course in psychology (Psych. 115 through 127), 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.) *Prerequisites: major in psychology and consent of instructor at least one quarter before start of course. Only counts once towards minor or major.*

199. Independent Study (2-4)

Independent study or research under direction of a member of the staff. Not counted for credit towards the major. *Prerequisite: special permission of department.* (P NP grades only.)

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.*

201C. 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. (S U grades permitted.)

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. Seminar.

204. Social Psychology (3)

The behavior of man as a function of social variables. Seminar.

205. Human-Information Processing (3)

An intensive introduction to the study of the human as an information-processing system. Covers topics in perception, memory, cognition, and artificial intelligence. (Not offered in 1980-81.)

206. Conditioning and Learning (3)

Classical and operant conditioning in lower animals. Seminar. (Not offered in 1980-81.)

209A. Judgment and Decision Making (3)

General theory of judgment and decision. Psychophysical judgment, social judgment, decision making, and rudiments of measurement theory. Primary emphasis on experimental applications. *Prerequisite: open to undergraduates with consent of instructor.* (Not offered in 1980-81.)

209B. Judgment and Decision Making (3)

General theory of judgment and decision. Primary emphasis on mathematical and statistical analysis of algebraic models both for controlled experiments and for observational field data. *Prerequisite: Psych. 209A.* (Not offered in 1980-81.)

210. Motivation and Learning (3)

Basic seminar on principles of human and animal motivation and learning. (Not offered in 1980-81.)

211. Piagetian Theory (3)

Selected topics in Piaget's theory of cognitive development. Seminar.

212A-B. Introduction to Visual Science I & II (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.* (212A not offered in 1980-81.)

213. Systematic Issues in Psychology (4)

Selected historical and current topics will be discussed from competing theoretical perspectives.

214. Alcohol and Its Problems (4)

The physiological actions of alcohol on the body; medical implications. Animal research on alcoholism. The relative importance of the environmental and genetic factors in alcoholism. Behavioral change due to alcohol intake. Alcohol consumption and interaction in small groups and society at large. *Prerequisite: undergraduates with consent of instructor.* (Not offered in 1980-81.)

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. Principles of Behavior (3)

Basic seminar on behavior theory with emphasis on principles of conditioning as the foundation of a general model of behavior. (Not offered in 1980-81.)

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.*

221. Judgmental Processes (2)

The psychology of judgments and information integration. Advanced seminar. (Not offered in 1980-81.)

222. Brain Functions (2)

Selected topics. Advanced seminar. (Not offered in 1980-81.)

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 UC San Diego. *Prerequisite: Psych. 212A or special consent of instructor.*

225. Experimental Analysis of Behavior (2)

Advanced seminar in modern techniques and findings, with special emphasis on operant conditioning and lower animals. Advanced seminar. (Not offered in 1980-81.)

226. Contemporary Problems in Vision (2)

Survey seminar on recent work in physiological optics, vision research and the visual process. (Not offered in 1980-81.)

227. Cognitive Development (2)

Selected topics with emphasis on current experimental work. Advanced seminar. *Prerequisite: consent of the instructor.* (Not offered in 1980-81.)

228. Advanced Topics in Mathematical Psychology (4)

Advanced seminar on mathematical models in learning, memory, perception, sensory processes. *Prerequisite: Psych. 201C.* (S/U grades permitted.) (Not offered in 1980-81.)

229. Selected Topics in Social Psychology (2)

Advanced seminar on theoretical issues in attitudes and social perception with special attention to current research. (Not offered in 1980-81.)

231. Advanced Topics in Human Information Processing (2)

Selected discussions of advanced topics. Advanced seminar. *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. Advanced seminar. *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. Advanced seminar. *Prerequisite: Psych. 210.*

234. Cognitive Development (2)

Nature and function of perception and judgment from a developmental point of view. Advanced seminar. (Not offered in 1980-81.)

235. Models in Sensory Psychology (3)

Models of information processing in sensory systems will be discussed. Physiological evidence and mathematical formalization will frequently be used. (Not offered in 1980-81.)

236. Animal Discrimination Learning (3)

Intensive examination of problems in the study of discrimination learning. (Not offered in 1980-81.)

237. Methods and Topics in Experimental Social Psychology (3)

An advanced seminar dealing with the laboratory and field methods of experimental social psychology and topics such as aggression, altruistic behavior, conformity, and bystander intervention. Students will be encouraged to engage in field experimentation. (Not offered in 1980-81.)

238. Psychological Theories of Pattern Recognition (3)

Examination of current theoretical and experimental approaches to problems of visual pattern recognition and object identification. (Not offered in 1980-81.)

239. The Development and Modification of Sensory Systems (3)

The course will emphasize experimental evidence and working models relating to the development of the sensory systems, especially vision and audition. The processing of complex stimuli and the underlying physiological mechanisms will be studied.

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.)

243. 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.*

244A-B. Psycholinguistics (4-4)

Discussion of human language abilities and consideration of a variety of psychological, biological, and linguistic models to account for them. (Not offered in 1980-81.)

245. Advanced Topics in Psycholinguistics (3)

Research and discussion on selected topics in psycholinguistics. *Prerequisite: consent of instructor.* (Not offered in 1980-81.)

246. Exploration in Cognition (3)

Research seminar in advanced topics in the study of cognition. *Prerequisites: restricted to students in the LNR research group; others should request consent of the instructor; advanced knowledge of modern concepts of human information processing.*

248. Semantic Theory (4)

An introduction to the fields of semantics and pragmatics. Material from linguistics, philosophy, and artificial intelligence will be related to current developments in psychology and psycholinguistics. *Prerequisite: consent of instructor.* (S/U grades permitted.) (Not offered in 1980-81.)

249. Reading (4)

Application of an information processing approach to reading, drawing on research findings in visual information processing, psycholinguistics, and artificial intelligence. Advanced seminar. (Not offered in 1980-81.)

251. Advanced Topics in Learning and Motivation (3)

Weekly meetings for graduate students actively engaged in research on conditioning. *Prerequisite: consent of instructor.*

253. Advanced Topics in Social Perception and Cognition

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. *Prerequisite: consent of instructor.*

256. Advanced Topics in Genetics and Field Development (3)

Research and discussion on selected topics in developmental psychology. *Prerequisite: consent of instructor.* (Not offered in 1980-81.)

257. Advanced Topics on the Analysis of Behavior (3)

Research and discussion on selected topics in the analysis of behavior. *Prerequisite: consent of instructor.* (Not offered in 1980-81.)

258A-B-C. Advanced Topics in Cognitive Science (3-3-3)

Designed for advanced graduate students and postdoctoral fellows in the Cognitive Science Program of the Center for Human Information Processing. In-depth discussions of current topics in the field of cognitive science, with emphasis on the study of human memory and language. *Prerequisites: advanced graduate standing in psychology, linguistics, computer science, or other related disciplines and consent of instructor.* (Not offered in 1980-81.)

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.* (Not offered in 1980-81.)

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.*

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 Research (1)

(S/U grades only.)

281A-B-C. Topics in Human Information Processing (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.* (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.)

SCIENCE AND TECHNOLOGY

OFFICE: 106 Chemistry
Research Building, Third College

Professors:

William F. Frazer, Ph.D. (*Physics*)
Donald R. Helinski, Ph.D. (*Biology*)
John Helton, Ph.D. (*Mathematics*)
Te Chiang Hy, Ph.D. (*EECS*)
Trevor C. McMorris, Ph.D. (*Chemistry*)
Sheldon Schultz, Ph.D. (*Physics*)
Melvin I. Simon, Ph.D. (*Biology*)
Herbert Stern, Ph.D. (*Biology*)
Daniel E. Wulbert, Ph.D. (*Mathematics*)

Associate Professors:

Willie C. Brown, Ph.D. (*Biology*,
*Chairman, Science and Technology
Program*)
Thomas J. Enright, Ph.D. (*Mathematics*)
P. A. George Fortes, Ph.D. (*Biology*)
Leonard Haff, Ph.D. (*Mathematics*)
Elvin Harper, Ph.D. (*Chemistry*)
William B. Kristan, Jr., Ph.D. (*Biology*)
Katja Lindenberg, Ph.D. (*Chemistry*)
Juan E. Luco, Ph.D. (*AMES*)
Ramon Pinon, Jr., Ph.D. (*Biology*)
Joseph W. Watson, Ph.D. (*Chemistry*,
Provost of Third College)
Juan Yguerabide, Ph.D. (*Biology*)

Assistant Professors:

Ronald J. Evans, Ph.D. (*Mathematics*)
Michael E. Garst, Ph.D. (*Chemistry*)
David Gough, Ph.D. (*AMES*)
John Leong, Ph.D. (*Chemistry*)
Oscar J. Lumpkin, Ph.D. (*Physics*)
Anthony Sebald, Ph.D. (*AMES*)
Richard L. Sites, Ph.D. (*EECS*)

Lecturers:

Edward E. Coughran, (*Director,
Computer Center*)
Dean S. Ezell, Ph.D. (*Biology*)
Meredith G. Somero, Ph.D. (*Biology*)
Frank B. Thiess, Ph.D. (*Mathematics*)

Science and Technology Program

The Science and Technology Program has two principal functions. First, it provides the Third College faculty in the sciences, mathematics, and engineering fields with an organizational structure in which to work collectively on behalf of the academic interests of the college and its students. Secondly, the program offers courses specifically designed to satisfy the general-education requirements for three quarters of science: biology, chemistry, and physics for the nonscience majors. Science and engineering majors are

required to satisfy the general-education requirements in science by taking the appropriate biology, chemistry, and physics courses designed for science majors. In general, the following guide should apply:

Nonscience Majors

The Science and Technology 10A-B-C sequence is designed specifically for nonscience majors with little or no prior exposure to the sciences.

Science Majors

It is intended that all science majors, and nonscience majors with good prior preparation in the sciences, satisfy the college general-education requirements in biology, chemistry, and physics by taking the appropriate courses designed for their particular major discipline.

The science departments, in conjunction with the colleges and the Committee on Educational Policy, completed a major reorganization of the lower-division basic science sequences during the 1979-80 academic year. The purpose of this reorganization was to simplify and facilitate the process by which undergraduates select the appropriate lower-division science courses based on prior preparation for their particular chosen major discipline as well as the general education requirements of their college.

The new course equivalent of the previous Science and Technology program courses are as follows:

Biology, Old Courses:

Sci./Tech. 10A. (Intro. to Modern Biol.) (F)
Sci./Tech. 11A (Vertebrate Zool. I) (F)
To be replaced by:

New Courses:

Sci./Tech. 10A, crosslisted with Biol. 11 (F)
Sci./Tech. 11A has no direct equivalent, but is now distributed in the course content of Biology 1 and 2.

Chemistry, Old Courses:

Sci./Tech. 10B (Chem.) (W)
Sci./Tech. 11B (Intro. Chem.) (S)
Sci./Tech. 12A-B-C (Chem.) (F)
Sci./Tech. 12AL-BL (Quant. Anal.) (F,W)
To be replaced by:

New Courses:

Sci./Tech. 10B (Chem.) (W)
Chemistry 5A (Intro. Chem.) (F,W)
Chemistry 6A-B-C (Gen. Chem.) (F,W,S/W,S,F)

Science and Technology

Chemistry 8AL/BL (Quant. Anal.) (W,S,S,F)

Physics, Old Courses:

Sci./Tech. 10C (Physics) (S)
Sci./Tech. 11C (Physics) (S)
Sci./Tech. 15A-B-C (Physics) (F,W,S)
Sci./Tech. 16BL-CL (Physics Lab.) (W,S)
To be replaced by:

New Courses:

Sci./Tech. 10C (Physics) (S)
Physics 11 (S)
Physics 1A-B-C (F,W,S/W,S,F)
Physics 1BL-CL (W,S,S,F)

Courses

Lower Division

10A. Introduction to Modern Biology (4)

This course introduces the fundamental concepts of cell and organismic diversity using microbiological approach. Major topics covered include cell structure and function, cell and organismic diversity, and interactions among biological systems. This course assumes no previous exposure to biology and is intended for students who do not plan to major in the sciences or engineering areas. Three hours of lecture and two hours of discussion/recitation. (Cross-listed with Biol. 11) (F)

10B. Chemistry (4)

This course covers the fundamental concepts and theories of chemistry, including atomic and molecular structure, the nature of chemical reactions, acids and bases, and an introduction to organic chemistry. The course assumes no prior exposure to chemistry and is intended for students who do not plan to major in science or engineering. Three hours of lecture, two hours of discussion/recitation. (W)

10C. Physics (4)

Selected basic phenomena encountered in the natural sciences. Typical topics include the range of length, time, and mass dimensions encountered in physical phenomena, energy and other selected topics as related to current problems in science and society. One-hour lecture and up to six hours tutorial. *Prerequisites:* Math. 4B or equivalent and Sci. Tech. 10B, or consent of instructor. (S)

16. Introduction to Engineering Mechanics (4)

Statics of particles and rigid bodies, forces in beams, cable structures, submerged structures, and machine elements. Analysis of elastic truss structures in two and three dimensions. Friction. Applications to engineering problems. *Prerequisites:* Physics 2A or 3A or equivalent Math. 2EA or Math. 2E (concurrent registration permitted) (S)

20. Problem Solving & Basic Programming (2)

This course is an introduction to BASIC mini-computer programming and applications. The following are typical of the topics covered: interactive techniques, simulation methods, subroutines, matrix manipulations, computer aided instructions, graphics, and statistics calculations. The class will meet for three weeks, for hands-on instruction on the two Third College computers. This will be followed by an individual project in the student's area of interest. A student with credit for EECS 61 will not be eligible for credit in this course. Students wishing to pursue further instruction in programming of computer science are advised to follow Science and Technology 20 with EECS 61. *Prerequisite:* this course will not require an extensive mathematics background. A solid high school background or some college mathematics will suffice. A student with credit for EECS 10 or EECS 13 will not be eligible for credit in this course. (F,W,S)

Upper Division

195. Undergraduate Teaching

Course is designed to provide undergraduate students with teaching experience in science laboratory courses. The students will assist in the preparation and running of laboratory sections (P/NP grades only). *Prerequisites:* accomplishment of above-average grade in course in question and consent of instructor. (F,W,S)

SCIENCE, TECHNOLOGY AND PUBLIC AFFAIRS

OFFICE: Room 7, Building 412, Warren College

Professors:

Herbert F. York, Ph.D. (*Physics*)
(*Program Director*)

Hannes Alfvén, Ph.D. (*APIS*)

James R. Arnold, Ph.D. (*Chemistry*)

James N. Brune, Ph.D. (*Geological Research Division, SIO*)

Clifford Grobstein, Ph.D. (*Biological Science and Public Policy*)

Sanford A. Lakoff, Ph.D. (*Political Science*)

Stanford S. Penner, Ph.D. (*AMES*)

Roger R. Revelle, Ph.D. (*Science and Public Policy*)

Associate Professor:

Georgios H. Anagnostopoulos, Ph.D.
(*Philosophy*)

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 technological and scientific development as well as the impact of science and 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 environmental problems.

The Minor Program for Warren College

The Science, Technology and Public Affairs (STPA) minor consists of six courses chosen from the following lists. Of these six, at least four must be from the list of STPA courses and not more than two of those four should be given by the same instructor. Two of the six courses may be chosen from the list of related courses in other departments and programs. Students' specific plans for completing the minor should be approved by the program office no later than early in the junior year.

Courses

Lower Division

35. Society and The Sea (4)

(Same as AMES 35.) Selected topics including living and nonliving resources, seaports and sea travel, the frail sea, the wild sea, military oceanology, legal, economic and social aspects, coastal zone management, scientific research, The sea and weather. C. Gibson.

69. Computers and Society (4)

(Same as EECS 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, it is based on the hypothesis that the computer affects all of us and is important for everyone to understand. R. Sites.

Upper-Division Core Courses

100A. Origins and Results of the World's Space Programs (4)

(Same as Contemporary Issues 100.) A course designed to explore and analyze the origins and results of a particular modern technology, using the world's space programs as an example. The political, technological, and strategic origins of the U.S., Soviet, and other space programs from the earliest times will be presented, with special emphasis on the period since World War II. Results to be discussed will include science and monitoring arms-control agreements. (Not offered in 1980-81.)

100B. Seminar on the Results and Value of the Space Programs (4)

A continuation, in seminar form, of STPA 100A for those who want to go more deeply into the matter. Each student will be required to present a paper for discussion by the others. Limited to twenty. *Prerequisite:* STPA 100A or consent of instructor. (Not offered in 1980-81.)

101A. Arms and Arms Control (4)

(Same as Frontiers of Science 104.) A course designed to explore and analyze a particular current issue in technology policy and how society goes about coping with it. The technological, political, and strategic ideas that underlie both the nuclear-arms race and attempts to control it will be discussed in a historical perspective. (Not offered in 1980-81 but covered in part in STPA Pol. Sci. 170.) H. York.

105A-B. Technology and Society (4-4)

(Same as Political Science 105A-B.) In the first quarter, the focus is on the making of U.S. science policy and the role of scientists in politics. In the second quarter, the theory of postindustrial society is examined, along with various policy issues, including the limits to growth controversy and energy policy. S. Lakoff.

105C. Technology and Society (4)

(Same as Political Science 105C.) This course concentrates on the policy issues raised by biomedical-scientific advances. The topical content varies from year to year but includes such areas as fertility control, fertilization *in vitro*, recombinant DNA, life support systems, and genetic engineering. Emphasis is placed on necessary mechanisms for interaction of scientific expertise and other perspectives in policy making. *Prerequisite:* STPA Pol. Sci. 105A or consent of instructor. C. Grobstein. R. Revelle.

107. Technology and Human Values (4)

(Same as Philosophy 125.) 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 warfare. G. Anagnostopoulos.

119A. Energy: Demands, Resources, Impact, Technology and Policy (4)

(Same as Frontiers of Science 119A.) Past and estimated future energy demands. Renewable and nonrenewable energy resources. Economic impact of energy use. Environmental impact of energy use. Energy conservation in manufacturing, transportation, home use. Energy policy. AMES and physics faculty.

119B. Energy: Nonnuclear Energy Technologies (4)

(Same as Frontiers of Science 119B.) Oil recovery from tar sands and oil shale. Coal production, gasification, liquefaction. The hydrogen economy. Energy-storage systems. Techniques for direct energy conversion. Solar energy utilization. Energy from windmills. Tidal and wave energy utilization. Hydroelectric power generation. Hydrothermal power production, transmission and distribution. *Prerequisites:* lower-division science and mathematics sequence in Revelle or equivalent and STPA 119A. AMES and physics faculty.

119C. Energy: Nuclear Energy Technologies (4)

(Same as Frontiers of Science 119C.) 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. *Prerequisites:* lower-division science and mathematics sequence in Revelle or equivalent and STPA 119B.

127. Understanding Earthquake Hazard (4)

(Same as Frontiers of Science 127.) This course will deal with elementary physical concepts necessary for understanding earthquake hazard. Topics will include earthquake causes, mechanism, probability, prediction, and ways of reducing earthquake hazard. The course will include discussions of public policy concerning building design, siting of nuclear reactors, and other critical structures. J. Brune.

132. Foods and Nutrition (4)

(Same as Frontiers of Science 132.) This course will be concerned with a broad look at the history of foods, their preservation, and distribution. The understanding of food is but a precursor to understanding the fundamental biological basis of nutrition, which will include a study of the digestive and assimilative aspects of human metabolism, as well as the necessary nutrients demanded by a human organism for proper growth and development. Both excesses and deficiencies of the various substances will be studied. A careful look at food fetishes, fads, and fancies will be examined. Public policy decisions with respect to insuring proper nutrition for this nation, and global strategies for essential nutrition for world populations will also be discussed. *Prerequisites:* lower-division science and mathematics sequence in Revelle or equivalent. P. Saltman.

134. Conservation — The Preservation of Endangered Species (4)

(Same as Frontiers of Science 134.) The preservation of endangered species will be considered from perspectives of ecology, population genetics, and public policy. M. Soule.

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 161.) This course aims to provide a theoretical and factual framework for the study of marine policy and to examine four or five 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. J. Sorensen.

170. American National Security Policy (4)

(Same as Political Science 170.) A course about U.S. national security objectives and the means for achieving them. Special emphasis will be placed on current U.S. military posture and arms control policies, and the rationales behind them. Topics will include the strategic balance, the NATO/Warsaw Pact confrontations, the Middle East, SALT, and other arms control forums. H. York and political science faculty.

171. Seminar in American National Security Policy (4)

(Same as Political Science 171.) Seminar in selected national security topics. Special emphasis will be placed on current U.S. military posture and arms control policies, and the rationales behind them. Other topics will include the strategic balance, the NATO/Warsaw Pact confrontations, the Middle East, SALT, and other arms control forums. *Prerequisites:* STPA Pol. Sci. 170. H. York.

180. Senior Seminar in Biomedical Science and Public Policy Analysis (4)

Readings and discussion of requirements for effective utilization of biomedical science in public policy analysis with examples drawn from biostandardization (radiation, carcinogenicity, toxicity), bioethics (life support, human experimentation), biological engineering, research policy, etc. *Prerequisite:* senior or graduate standing. Grobstein and others

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. H. York, C. Grobstein, R. Revelle

Related Courses

Courses in other departments and programs (change somewhat from year to year).

AMES 33, 34

Biology 5

Chemistry 149A

Communications 100A-B-C, 159

Economics 116, 130, 161

EECS 35

Frontiers of Science 120

History 190A-B-C

Philosophy 40A-B

Sociology 157

SCRIPPS INSTITUTION OF OCEANOGRAPHY

OFFICE: 1156 Ritter Hall

Professors:

Gustaf Arrhenius, Ph.D.
(*Oceanography*)

George E. Backus, Ph.D. (*Geophysics*)

Andrew A. Benson, Ph.D. (*Biology*)

James N. Brune, Ph.D. (*Geophysics*)

Charles S. Cox, Ph.D. (*Oceanography*)

Harmon Craig, Ph.D. (*Geochemistry and Oceanography*)

Joseph R. Curray, Ph.D. (*Marine Geology*)

Russ E. Davis, Ph.D. (*Oceanography*)

Albert E. J. Engel, Ph.D. (*Geology*)

James T. Enright, Ph.D. (*Behavioral Physiology*)

J. Freeman Gilbert, Ph.D. (*Geophysics*)

Edward D. Goldberg, Ph.D. (*Chemistry*)

Harold T. Hammel, Ph.D. (*Physiology*)

Richard A. Haubrich, Ph.D.
(*Geophysics*)

James W. Hawkins, Ph.D. (*Geology*)

Francis T. Haxo, Ph.D. (*Biology*)

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*)

Charles D. Keeling, Ph.D.
(*Oceanography*)

Devendra Lal, Ph.D. (*Nuclear Geophysics*)

Ralph A. Lewin, Ph.D., Sc.D. (*Biology*)

John A. McGowan, Ph.D.
(*Oceanography*)

Henry W. Menard, Ph.D. (*Geology*)

Michael M. Mullin, Ph.D.
(*Oceanography and Chairman of the Department*)

Walter H. Munk, Ph.D. (*Oceanography*)

William A. Newman, Ph.D.
(*Oceanography*)

William A. Nierenberg, Ph.D.
(*Geophysics, Vice Chancellor of Marine Sciences and Director of Scripps Institution of Oceanography*)

Robert L. Parker, Ph.D. (*Geophysics*)

Joseph L. Reid, M.S. (*Oceanography*)

Richard H. Rosenblatt, Ph.D. (*Marine Biology*)

George G. Shor, Jr., Ph.D. (*Marine Geophysics*)

Richard C. J. Somerville, Ph.D.
(*Meteorology*)

Fred N. Spiess, Ph.D. (*Oceanography*)

Charles W. Van Atta, Ph.D. (*Engineering Physics and Oceanography*)

Benjamin E. Volcani, Ph.D.
(*Microbiology*)

Edward L. Winterer, Ph.D. (*Geology*)

Robert S. Arthur, Ph.D. (*Oceanography, Emeritus*)

Seibert Q. Duntley, Sc.D. (*Physics, Emeritus*)

Denis L. Fox, Ph.D. (*Marine Biochemistry, Emeritus*)

Martin W. Johnson, Ph.D. (*Marine Biology, Emeritus*)

Fred B. Phleger, Ph.D. (*Oceanography, Emeritus*)

Russell W. Raitt, Ph.D. (*Geophysics, Emeritus*)

Norris W. Rakestraw, Ph.D. (*Chemistry, Emeritus*)

Roger R. Revelle, Ph.D.
(*Oceanography, Emeritus*)

Per F. Scholander, M.D., Ph.D.
(*Physiology, Emeritus*)

Francis P. Shepard, Ph.D. (*Submarine Geology, Emeritus*)

Victor Vacquier, M.A. (*Geophysics, Emeritus*)

Claude E. ZoBell, Ph.D. (*Marine Microbiology, Emeritus*)

Associate Professors:

Jeffrey L. Bada, Ph.D. (*Marine Chemistry*)

Scripps Institution of Oceanography

Wolfgang H. Berger, Ph.D.
(*Oceanography*)

Paul K. Dayton, Ph.D. (*Oceanography*)

LeRoy M. Dorman, Ph.D. (*Geophysics*)

D. John Faulkner, Ph.D. (*Marine Chemistry*)

Carl H. Gibson, Ph.D. (*Engineering Physics and Oceanography*)

Joris M.T.M. Gieskes, Ph.D.
(*Oceanography and Vice Chairman of the Department*)

Thomas H. Jordan, Ph.D. (*Geophysics*)

Miriam Kastner, Ph.D. (*Geology*)

Kenneth H. Nealson, Ph.D. (*Marine Biology*)

Melvin N.A. Peterson, Ph.D.
(*Oceanography*)

George N. Somero, Ph.D. (*Biology*)

Victor D. Vacquier, Ph.D. (*Marine Biology*)

Clinton D. Winant, Ph.D.
(*Oceanography*)

Assistant Professors:
Daniel Goodman, Ph.D. (*Population Biology*)

Robert T. Guza, Ph.D. (*Oceanography*)

William S. Hodgkiss, Ph.D. (*Electrical Engineering*)

J. Douglas Macdougall, Ph.D. (*Earth Sciences*)

Richard L. Salmon, Ph.D.
(*Oceanography*)

Hans R. Thierstein, Ph.D. (*Geology*)

Adjunct Professors:

Willard N. Bascom (*Applied Ocean Sciences*)

Edwin L. Hamilton, Ph.D.
(*Oceanography*)

John R. Hunter, Ph.D. (*Marine Biology*)

Reuben Lasker, Ph.D. (*Marine Biology*)

Robert H. Stewart, Ph.D.
(*Oceanography*)

Lecturers:

Yaacov K. Bendor, Ph.D. (*Research Geologist*)

Angelo F. Carlucci, Ph.D. (*Research Microbiologist*)

Theodore Enns, Ph.D. (*Research Physiologist*)

Richard W. Eppley, Ph.D. (*Research Biologist*)

William Evans, Ph.D.

Abraham Fleminger, Ph.D. (*Research Biologist*)

Edvard A. Hemmingsen, Ph.D.
(*Research Physiologist*)

Osmund Holm-Hansen, Ph.D.
(*Research Biologist*)

Gerald L. Kooyman, Ph.D. (*Research Physiologist*)

Scripps Institution of Oceanography

William R. Riedel, D.Sc. (*Research Geologist*)

Farooq Azam, Ph.D. (*Associate Research Biologist*)

Jonathan Berger, Ph.D. (*Associate Research Geophysicist*)

Ralph J. Cicerone, Ph.D. (*Associate Research Chemist*)

William H. Fenical, Ph.D. (*Associate Research Chemist*)

Jeffrey B. Graham, Ph.D. (*Associate Research Biologist*)

Ray F. Weiss, Ph.D. (*Associate Research Geochemist*)

Robert A. Knox, Ph.D. (*Assistant Research Oceanographer*)

Peter F. Lonsdale, Ph.D. (*Assistant Research Geologist*)

Gregory F. Moore, Ph.D. (*Assistant Research Geologist*)

John A. Orcutt, Ph.D. (*Assistant Research Geophysicist*)

Robert Pinkel, Ph.D. (*Assistant Research Oceanographer*)

Kenneth L. Smith, Jr., Ph.D. (*Assistant Research Biologist*)

Elizabeth L. Venrick, Ph.D. (*Assistant Research Biologist*)

Affiliated Faculty:

Victor C. Anderson, Ph.D. (*Professor, EECS*)

Hugh Bradner, Ph.D. (*Professor, AMES*)

Theodore H. Bullock, Ph.D. (*Professor, Neurosciences*)

John W. Miles, Ph.D. (*Professor, AMES*)

Fred N. White, Ph.D. (*Professor, Medicine*)

G. David Lange, Ph.D. (*Associate Professor, Neurosciences*)

The graduate department of the Scripps Institution of Oceanography offers graduate instruction leading to M.S. and Ph.D. degrees in oceanography, in marine biology and in earth sciences. Emphasis is on the Ph.D. program. A student's work normally will be concentrated in one of several curricular programs within the department. These programs now include: biological oceanography, marine biology, 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, foodchain dynamics, community ecology of benthic and pelagic forms, population dynamics habitat changes and disruption, fishery biology, 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 physiological and biochemical processes in marine organisms, their genetic relationships, 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, ultrastructure, photobiology (photosynthesis and respiration, energy-transfer processes and comparative anatomy and physiology of vertebrate and invertebrate vision), barobiology, cardiovascular physiology, comparative biochemistry, comparative and cellular physiology, neurophysiology and behavior, systematics, distribution, ecology, developmental biology and evolution of marine animals and plants.

Marine Chemistry is concerned with chemical processes operating within the marine environment; the oceans, the marine atmosphere, and the sea floor. The interactions of the components of seawater with the atmosphere, with the sedimentary solid phases, and with plants and animals form the basis for research programs. These include: investigations of the carbon system, natural products, chemical interactions between marine organisms, physical and inorganic chemistry of sediment water systems, organic chemistry in the marine environment, distribution of noble gases in seawater, and effects of pollutants on the marine environment.

Geological Sciences emphasizes the application of observational, experimental and theoretical methods of the basic sciences to the understanding of the solid earth, ocean, atmosphere, and the solar system. Principal subprograms at Scripps are Marine Geology, Petrology, and Geochemistry. Expedition work at sea and field work on land are emphasized as an essential complement 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. The Geochemistry Program is designed for students with undergraduate majors in either geology or chemistry. Areas of advanced study and research include the geochemistry of the ocean, the atmosphere, and the solid earth, nuclear geochemistry, circulation and mixing of oceanic water masses based on carbon, oxygen, carbon-14, radium, radon, stable isotopes, and rare gases, studies of volcanic and geothermal phenomena, the interaction of sediments with seawater and interstitial waters, geochemical cycles, and the history and composition of the ocean and sedimentary rocks.

Geophysics emphasizes the application of general experimental and theoretical methods of physics to fundamental problems in the atmosphere, oceans, and interior of the Earth, and in the solar system. Research interests within the curricular group include: magnetohydrodynamic phenomena in the Earth's core, hydrodynamics of oceans and atmospheres, geophysical inverse problems, theoretical seismology, the design of geophysical arrays, multichannel dataprocessing methods, nonlinear tidal prediction, long-period resonant and equilibrium fluctuations in the Earth and its oceans, radiative transfer in the sea and the atmosphere, interactions of weakly non-linear wave fields, studies of oceanic crustal structure, acoustic propagation in the oceans, interpretation of regional geomagnetic data, processes of ocean-floor spreading, and irreversible thermodynamics.

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 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 Engineering and Computer Sciences 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 bathymetricmagnetic trends; deep-sea drilling; 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 communication and signal detection; underwater photography and television; visibility by swimmers; underwater lasers; remote sensing of sea-surface temperature, roughness, and marine resources from aircraft and orbital spacecraft; meteorology above the oceans; turbulent flows, formation of barrier beaches; mechanisms of currents, sand transport and sediment transport in the surf zone, the shelf and in submarine canyons; diving and hyperbaric physiology. Studies of air-sea interaction, turbulence in mixing from FLIP, and ships of the Scripps fleet.

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. Biology and geology, minimum of one quarter each.

6. Preparation in at least one foreign language chosen from the following: German, Russian, a Romance language.
7. Applicants for admission are required to submit scores on the verbal and quantitative tests 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 three of the following four 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 at UC San Diego 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. A strong scholastic record in a narrower biological field may be considered in lieu of breadth of background.

Marine chemistry — major in chemistry or biochemistry.

Geological sciences — major in one of the earth sciences or physical or inorganic chemistry. Physical chemistry with calculus is 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 UC San Diego.

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. 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-B-C, 276A-B, 280, 280L, and one of 289, 274 or 294A. Other course work ordinarily will be recommended by the student's advisory committee, usually including 278 (or equivalent) 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.

Marine Biology

Entering graduate students will be expected to gain a varied research experience in several laboratories during their first year through a "rotation system" normally consisting of six weeks' involvement in the activities of each of three different laboratories to be selected in consultation with their guidance committees and with the consent of the other professors concerned. In their first year at SIO, or latest, early in the fall quarter of their second year, 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, 260, 280, 280L and 289, as well as any other course work recom-

mended by the advisory committee. All students are expected to enroll and actively participate in a seminar course during two quarters of each year.

Marine Chemistry

Students in the curriculum will be expected to take courses within the areas of physical and biological oceanography and marine geology or marine biology, as well as courses in the Department of Chemistry, which will be assigned according to personal needs after consultation with a faculty adviser.

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 the Marine Geology Seminar (SIO 248A-B-C). The "basic" courses (SIO 210A, 260 and 280) 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 placement examinations during registration week of the fall quarter, and 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 are no additional language requirements beyond the general department admission requirement of one year of college-level study in a modern foreign language useful in the student's studies.

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 winter quarter of the second year of residence each student will be given an oral departmental examination, which is 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 have satisfied the departmental admission requirement of preparation in at least one important foreign language and to demonstrate proficiency in the subjects treated by the following courses: SIO 210A, 211A-B, 212A-B, 214, 223, AMES 294A-B-C, one of SIO 240, 260 or 280 plus two additional SIO courses selected with approval by the student adviser.

Applied Ocean Sciences

Students must: (a) take or demonstrate their knowledge of the following basic courses: SIO 210A, 240, 260, 280 and AMES 294A-B-C, and (b) attend the Applied Ocean Sciences Seminar 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.

Language Requirements

The department has no formal language requirements. Graduate students are expected to have satisfied the entrance requirement of preparation in at least one important foreign language. Within the department, 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 marine chemistry, the student will be expected to present, in an oral examination, both a major and a minor proposition. The major proposition will consist of a statement of an original research problem or scientific idea within his or her area of interest. The student should be prepared to discuss the theory and experimental techniques that may be involved, the significance of the proposition, and its relationship to previous knowledge. The minor proposition should consist of a discussion of the student's thesis research. 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. It is expected that each doctoral candidate will submit a manuscript based on this dissertation for publication in a scientific journal.

Special Financial Aids

In addition to teaching and research assistantships, fellowships, traineeships and other awards available on a campus-wide competitive basis, the department has available a certain number of fellowships and research assistantships supported from research grants and contracts, or from industrial contributions.

Courses

Upper Division

198. Directed Group Study (2-4)

Directed group study on a topic or in a field not included in the regular department curricula, by special arrangement with a faculty member (P/NP grades only) *Prerequisite:* consent of instructor. Staff (F,W,S)

199. Special Studies (2 or 4)

Independent reading or research on a problem by special arrangement with a faculty member. (P/NP grades only) *Prerequisite:* consent of instructor

Graduate

207A. Digital Signal Processing I (3)

Sampling; A/D and D/A conversion; discrete linear system theory; z-transforms; digital filters; recursive and nonrecursive designs; quantization effects; fast Fourier transforms; windowing; high speed correlation and convoluting; discrete random signals; finite word length effects. *Prerequisite:* EECS 152A-B-C or equivalent. Hodgkiss (F) (S/U grades permitted.)

207B. Digital Signal Processing II (3)

Power spectrum estimation; homomorphic signal processing; applications to: speech, radar/sonar, picture, biomedical, and geophysical data processing. *Prerequisite:* SIO 207A or consent of instructor. Hodgkiss (W) (S/U grades permitted.)

207C. Digital Signal Processing III (3)

Single and multi-channel data processing in a time varying environment; adaptive filters; high resolution spectral estimation; linear prediction; adaptive beamforming. *Prerequisite:* SIO 207A-B or consent of instructor. Hodgkiss (S) (S/U grades permitted.)

208. Seminar Applied Ocean Sciences (1)

Topics in applied ocean sciences. One hour seminar. Staff (F,W,S) (S/U grades only.)

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 (3)

Physical description of the sea; physical properties of seawater, methods and measurements, boundary processes, regional oceanography. *Prerequisite:* the mathematics and physics required for admission to the graduate curriculum in the Scripps Institution of Oceanography (see text), or consent of instructor. Hendershott, Reid (F)

210B. Physical Oceanography (3)

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. *Prerequisite:* SIO 210A and consent of instructor. Cox. (F) (S/U grades permitted.)

211A-B. Ocean Waves (3-3)

Propagation and dynamics of waves in the ocean including the effects of stratification, rotation, topography, wind and nonlinearity. *Prerequisite:* SIO 210A, 214. Hendershott, Guza (W,S)

212A-B. Dynamical Oceanography (3-3)

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 instructors. Salmon, Hendershott (W,S)

214. Introduction to Fluid Mechanics (3)

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 (4-4)

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 (3)

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 instructor. SIO 214, 211A recommended. Inman, Guza (W)

216B. Nearshore Processes (3)

Application of the mechanics of wind, wave and sediment transport to the nearshore environment and to the formation of sedimentary structures and beaches. Fluid mechanics of the surf zone; generation of longshore and rip currents, surf beat, nonlinear waves. *Prerequisite:* SIO 211A or 214 or 216A. Guza, Inman (S)

218. Dynamic Meteorology (3)

Thermodynamics and statics of dry and moist air; equations of motion; scale analysis; elementary applications and wave solutions; thermal convection and laboratory analogues to atmospheric motions; predictability theory; atmospheric general circulation and energetics; theoretical models for weather forecasting and climate simulation. (S/U grades permitted.) Somerville (F)

219. Special Topics in Physical Oceanography (1-4)

Example topics are case histories and methods in physical oceanography, theories of the ocean circulation, numerical methods in large-scale ocean and atmospheric models, and natural electromagnetic phenomena in the earth and the oceans. Staff (F,W,S)

220. Topics in Geophysical Continuum Mechanics (3)

Mathematical foundations, physical limitations and selected geophysical applications of continuum mechanics. Topics include finite strain, thermodynamics of stress-strain relations, phenomenology and mechanisms of dissipation, continuum theory of dislocations, and generation and propagation of elastic waves in a nearly homogeneous medium. *Prerequisites:* differential and integral calculus, differential equations, linear algebra. Backus (F)

221. Topics in Geophysical Fluid Dynamics (3)

Effects of viscosity, density gradients, and gravitational and electromagnetic fields on fluid motion. Topics include force and free convection and percolation, Alfvén waves, and the theory of the origin and secular variation of the earth's magnetic field. *Prerequisite:* SIO 220. Backus (W)

222. Tensors in Geophysics (3)

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. Backus (F)

223. Geophysical Data Analysis (3)

Design of geophysical experiments and analysis of geophysical measurements, interpretation of geophysical time series sampling, least squares, spectrum analysis. Haubrich (W)

224. Internal Constitution of the Earth (3)

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, base chemistry and physics, or consent of instructor. Jordan (S)

226A. Introduction to Marine Geophysics I (3)

Methods of geophysical investigations in the ocean, with emphasis on seismic and acoustic methods. Includes discussion of instrumentation, field methods, data processing, interpretation, assumptions, limitations. Critical discussion of "state of the art" and current results. The course is intended primarily for geologists and geophysicists. *Prerequisites:* calculus, differential equations, classical physics, at least one geology course, or consent of instructor. Shor (W)

226B. Introduction to Marine Geophysics II (3)

Methods of geophysical investigations in the ocean, with emphasis on gravity, magnetic, and geothermal methods. Includes discussion of instrumentation, field methods, data processing, interpretation, assumptions, and limitations. Critical discussion of "state of the art" and current results. The course is intended primarily for geologists and geophysicists. *Prerequisites:* calculus, differential equations, classical physics, at least one course in geology, or consent of instructor. Dorman (S)

227A-B-C. Seismology (3-3-3)

Equation of motion, exact transient solution of canonical problems, interface pulses, geometrical diffraction theory, ray theory and mode theory in plane-layer media, free oscillations of the earth, radiation from moving sources, source determination, aeolotropic and heterogeneous media, dissipation, interpretation problems. *Prerequisite:* consent of instructor. Jordan, Gilbert (W,S)

229. Geomagnetism (3)

Survey of the application of electromagnetic theory to the solid earth, the main geomagnetic field, the dynamo model of its source, implications of the dynamo theory, induction by exter-

nal variations, the electrical conductivity inverse problem and its solution, electromagnetic anomalies, induction in simple bodies, induction in the oceans, magnetotelluric theory. *Prerequisites: advanced calculus, differential equations, complex variables and familiarity with Maxwell's equations, or consent of instructor.* Parker (S)

230. Introduction to Inverse Theory (3)

Linear theory of Backus and Gilbert; non-linear theory, which is an approximation based on the linear solution; Backus' inference treatment and the instructor's own variational methods. Examples will be drawn from gravity, geomagnetism and seismology. *Prerequisite: consent of instructor.* Parker (S)

231A-B. Seismological Methods (3-3)

Problems and techniques in seismology, seismic wave propagation, free oscillations of the earth, earthquake source mechanism, seismogram analysis, instrumentation. *Prerequisite: consent of instructor.* Brune (F,W)

232. Interpretation of Seismograms (3)

This course will deal with the principles and practice in the interpretation of seismograms. A variety of projects involving the analysis of seismograms will be assigned. *Prerequisite: consent of instructor.* Brune, Jordan (S)

233. Seminar on Seismology (3)

Assignments in reading, class presentations and discussions of important papers in seismology. *Prerequisite: graduate students.* (S/U grades permitted.) Brune (F)

234. Seminar on Essentials of Geophysics (3)

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. Parker (F) (S/U grades permitted.)

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. Staff (F,W,S) (S/U grades permitted.)

240. Marine Geology (3)

Introduction to the geomorphology, sedimentation, stratigraphy, vulcanism, structural geology, tectonics, and geological history of the oceans. *Prerequisites: the physics, chemistry, and geology required for admission to the graduate curriculum in SIO, or consent of instructor.* Staff (W)

241A-B. Continental Margin Sediments (3-3)

Lectures, reading and discussion of Quaternary sediments, environments of deposition, and physiography of the continental margin, including the shore zone, continental shelf and slope, deep sea fans, and continental rise. *Prerequisite: consent of instructor.* Curray (S,W)

243A. Marine Stratigraphy (2)

Principles of stratigraphy as applied to marine environments. *Prerequisite: SIO 240 or consent of instructor.* Winterer (F)

243B. Laboratory in Marine Stratigraphy (2)

Laboratory study and interpretation of microfossils in oceanic sediments. *Prerequisite: SIO 240 or consent of instructor.* Riedel (S)

244. Seminar in Sedimentary Petrology (3)

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 (3)

Characteristics and origin of sediments and sedimentary rocks. *Prerequisite: consent of instructor.* Winterer (W)

245B. Sedimentary Geochemistry and Mineralogy (3)

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)

246A. Paleooceanography (2)

Principles and methods of paleooceanographic and paleoclimatic research, evolution and ecology of marine microorganisms, history of oceanic sedimentation, isotopic geochemistry of calcareous microfossils, oceans and global climate in glaciated and non-glaciated times. *Prerequisite: consent of instructors.* (S/U grades permitted.) Berger, Thierstein (W)

246B. Oceanic Micropaleontology (2)

Introduction to ecology, evolution, taxonomy of foraminifera and coccoliths, lab exercises in biostratigraphic dating and paleoecological analyses. *Prerequisite: consent of instructors.* (S/U grades permitted.) Berger, Thierstein (W)

248A-B-C. Seminar in Marine Geology (3-3)

An advanced discussion of the geomorphology, sedimentation, stratigraphy, vulcanism, structural geology, tectonics, and geological history of the ocean. *Prerequisites: the requirements for admission to the Geological Sciences Curricular Group of the Scripps Institution of Oceanography or consent of instructor.* Staff (F,W,S.) (S/U grades permitted.)

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 (3)

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 (3)

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 (3)

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. *Prerequisite: Math. 2D or equivalent, SIO 210A.* (S/U grades permitted.) Craig (W)

252B. Nuclear Geophysics (3)

Natural radioactivity on the earth; artificial radioactivity on the earth, radioactive nuclei as tracers or tools for studying earth sciences and meteoritics, experimental data and information to date. Lal (S)

252C. Nuclear Geology (3)

Treats various topics dealing with natural radioactivity; radiometric dating techniques, their potentials and limitations, discussed in detail with examples from current applications; implications of Rb-Sr, K-Ar and U-Pb systematics for crustal and atmospheric evolution, terrestrial heat production. Macdougall (W)

253. Igneous and Metamorphic Petrology (3)

Physical, chemical and mineralogic properties of igneous and metamorphic rocks. Emphasis is on the origin and genetic relationships as interpreted from field occurrences, theoretical studies and experimental data. *Prerequisite: physical geology, geochemistry, mineralogy, physical chemistry (may be taken concurrently).* Hawkins (F)

254. Advanced Igneous Petrology (3)

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 (3)

The properties, origin, and evolution of the rocks in the earth's crust. *Prerequisite: one year of graduate study in Scripps Institution of Oceanography or consent of instructor.* Engel (W)

256A. Field Geology (4)

Mapping of a field area and preparation of a geological report. Principles of stratigraphy and descriptive structural geology are outlined in the lecture room and in the field. Field work is done on weekends in a local area. *Prerequisite: consent of instructor.* (S/U grades permitted.) Engel, Thierstein, Winterer (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). Engel (S)

257. Seminar in Petrology (3)

Discussion of current research in petrology and mineralogy. (S/U grades permitted.) Hawkins (W)

258. Seminar in Geology (3)

Discussions of current research and special topics in geology not treated in the general courses. Staff (F,W,S)

259. Seminar in Geochemistry (2)

The subject matter will vary from year to year and will normally cover an area of geochemistry not treated extensively in other courses. Craig (F,W,F) (S/U grades permitted.)

260. Marine Chemistry (3)

Chemical description of the sea; the distribution of chemical species in the world oceans, and their relationships to physical, biological, and geological processes. Gieskes (W)

261. Physical Chemistry of Seawater (3)

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 (S)

263. Major Chemical Cycles in the Sea (3)

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 (3)

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 dynamics of phase change. Conductivity, magnetic and optical properties of solid with particular consideration of geological systems. *Prerequisite: consent of instructor.* Arrhenius (W)

265. Marine Natural Products Chemistry (3)

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 (3)

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)

267. Management of the Marine Environment (3)

Definition of problems involving man's alteration of the chemistry of the ocean. The relative contributions of man and other natural inputs to the marine environment will be compared. Problems in the national and international management of ocean resources will be dealt with. *Prerequisite: open to second year SIO students.* Goldberg (S)

268. Seminar in Marine Chemistry (1)

Discussion of topics related to the chemistry of the marine environment not treated in general courses. (S/U grades permitted.) Bada (W)

269. Special Topics in Marine Chemistry (1-4)

Special course offerings by staff and visiting scientists. Staff (F,W,S)

270. Pelagic Ecology (3)

An analysis of the concepts and theories used to explain the biological events observed in the ocean. Emphasis on plankton. Alternate years. *Prerequisite: SIO 210A, 280 or consent of instructor.* McGowan, Mulin (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.* Mullin (S/U grades only.) (S)

273. The Evolution of Invertebrates (2)

Lectures on the origin of multicellularity and the phylogeny of the invertebrate higher taxa as deduced from embryology, morphology and the fossil record. *Prerequisite: SIO 280, 280L or equivalent.* Newman (W)

274. Marine Arthropods (4)

Lectures and laboratories on the natural history zoogeography, taxonomy and phylogeny of arthropods, with emphasis on marine forms. Alternate years. *Prerequisite: SIO 280, 289L or equivalent.* Newman, Hessler (W)

275A-B. Population and Community Models (3-3)

Survey of techniques for forming and testing hypotheses concerning the quantitative aspects of population and community ecology. *Prerequisite: consent of instructor.* Goodman (F,W) (S/U grades permitted.)

275C. Topics in Community Ecology (3)

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. *Prerequisite: consent of instructor.* (S/U grades permitted.) Dayton (S)

275D. Natural History of Coastal Habitats (4)

Two three-hour laboratories per week, two four-week-long field trips to sites in Baja California and the Monterey Bay area, several one-three 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 275C. *Prerequisite: open to undergraduates with consent of instructor.* (S/U grades permitted.) Dayton (S)

276A-B. Applied Statistics (3-3)

Methods of statistical analysis, including both parametric and nonparametric procedures; sampling and design of experiments, with emphasis on those procedures particularly useful in marine studies. *Prerequisite: the mathematics required for admission to SIO or consent of instructor.* Staff (W,S)

276C. Mathematics in Biology (3)

Matrices and the eigenvalue problem as applied to theoretical ecology. Phase plane techniques in the study of nonlinear differential equations of the Lotka-Volterra type. *Prerequisite: calculus.* (S/U grades only.) Lange (W)

276D. Mathematics in Biology (3)

Multivariate analysis. Multivariate hypothesis testing and the theory and use of principle components, factor and canonical correlation analyses. *Prerequisite: calculus and equivalent of SIO 276A and C.* (S/U grades only.) Lange (W)

276E. Mathematics in Biology (3)

Fourier and Laplace transforms. *Prerequisites: calculus and equivalent of SIO 276C.* (S/U grades only.) Lange (S)

277. Deep-Sea Biology (2)

The ecology, zoogeography, taxonomy, and evolution of deep-sea organisms, with emphasis on the benthos. Alternate years. *Prerequisite: consent of instructor.* (S/U grades only.) Hessler (W)

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)

Staff (F,W,S) (S/U grades permitted.)

280. Marine Communities and Environments (3)

Marine environments and their effects on ecological processes and community structure, distribution patterns, adaptations, and evolution of marine organisms. *Prerequisites: bachelor's degree in science or consent of instructor; concurrent registration in SIO 280L required for students in marine biology and biological oceanography curricula.* Mullin (F)

280L. Laboratory in Marine Organisms (2)

Laboratory and discussion of the phylogeny, comparative morphology and taxonomy of the major groups of marine organisms, with emphasis on animals. *Prerequisite: registration in SIO 280.* Fleming and Staff. (F)

281. Environmental Physiology and Biochemistry of Marine Organisms (3)

Emphasis on adaptation to environmental factors such as temperature, pressure, and salinity. *Prerequisite: adequate training in biology and physical sciences, and consent of instructor.* Somero (W)

282. Physiology of Marine Vertebrates (3)

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.* Hammel (W)

283. Isotope Tracer Techniques and Related Topics in Physiology (3)

Biological transport and related processes as determined by isotope tracers. Laboratory includes methods of measuring radioactive and stable isotope tracers, and tracer experiments in marine organisms. *Prerequisite: consent of instructor.* (S/U grades permitted.) Enns (S)

284. Cell Physiology of Marine Organisms (4)

Deals with (1) how methods of cell biology can solve problems peculiar to marine animals and (2) how marine animals provide favorable systems for elucidation of general problems of cell biology. *Prerequisites: basic courses in biology and chemistry; consent of instructor.* Holland (W)

285. Marine and Comparative Biochemistry (3)

Biochemistry of major products of marine organisms, with emphasis on carbohydrates and lipids. The current concepts of their structural and physiological function will be presented and discussed. *Prerequisites: organic chemistry required, physical chemistry and biochemistry recommended.* Benson (S)

285L. Methods in the Comparative Biochemistry of Marine Organisms (4)

Emphasis on biochemical techniques of usefulness to marine biologists. Techniques to be covered include: enzyme purification and assay; starch and acrylamide gel electrophoresis; ultracentrifugation; and ion exchange chromatography. *Prerequisites: adequate training in biology and biochemistry, and consent of instructors.* Somero, Nealson (S)

286. Cellular Structure and Biochemical Function (3)

Lectures and laboratory studies of subcellular structures and their function in cell metabolism. Experiments involving techniques for isolation and biochemical assay with special reference to marine organisms. *Prerequisites: preparation in biology and biochemistry; consent of instructor. SIO 285 and Biology 201 are recommended for background.* Volcani (S)

287A. Microbial Ecology (3)

The biochemistry and ecological importance of microorganisms to the marine environment. *Prerequisite: consent of instructor.* Nealson, Carlucci (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. Nealson (S)

287C. Microbial Biosynthesis (3)

Pathways, regulation and energetics of biosynthesis of small molecules. Control mechanisms which regulate the activity of biosynthetic pathways in prokaryotes and some lower eucaryotes. Pathways covered will include purine and pyrimidine bases, amino acids, vitamins, sugars and antibiotics. *Prerequisites: preparation in biochemistry and microbiology and consent of instructor.* Nealson (S)

288. Deuterostome Biology (4)

Lectures on functional morphology, natural history and evolutionary biology of the deuterostome invertebrates (protochordates, echinoderms and minor phyla). *Prerequisite: elementary invertebrate zoology and consent of instructor.* Holland (W)

289. Marine Plants (4)

An introduction to marine plants and the roles they play in the ecology of the seas. *Prerequisite: consent of instructor.* Lewin (W)

291. Physiology of Marine Algae (3)

Lectures and laboratory in comparative physiology of algae with emphasis on marine problems. *Prerequisite: basic courses in biology and chemistry.* Haxo (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 (3-3)

(A) Ethological approach. Species characteristic 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)

293L. Experimental Laboratory in Animal Behavior (2)

Quantitative behavioral experiments on fish and invertebrates, focusing on social behavior and orientation. *Prerequisite: consent of instructor.* Heiligenberg (S)

294A. Biology of Fishes (4)

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 permitted.) Rosenblatt (F,W)

295. Laboratory Techniques in Cell and Developmental Biology (4)

A laboratory in cell and developmental biology with an emphasis on techniques. Observations on culturing developing embryos. Measurement of amino acid transport, protein and DNA synthesis in embryos. Autoradiography, enzyme assays, gel electrophoresis, digestive enzymes of marine larvae, metamorphosis, analysis of fertilization and the metabolic activation of development. *Prerequisite: consent of instructor.* 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)

SOCIOLOGY

OFFICE: 7001 Humanities and Social Sciences Building, Muir College

Professors:

Bennett M. Berger, Ph.D. (*Chairman*)
Aaron Cicourel, Ph.D.
Fred Davis, Ph.D.
Jack D. Douglas, Ph.D.
César Graña, Ph.D.
Joseph R. Gusfield, Ph.D.
Jacqueline P. Wiseman, Ph.D.

Associate Professors:

Rae Lesser Blumberg, Ph.D.
Bennetta Jules-Rosette, Ph.D.
Hugh B. Mehan, Ph.D.
David P. Phillips, Ph.D.
Andrew T. Scull, Ph.D.

Assistant Professors:

Beryl L. Bellman, Ph.D.
Bruce C. Johnson, Ph.D.
Kristin Luker, Ph.D.
Richard P. Madsen, Ph.D.
Timothy L. McDaniel, Ph.D.
Chandra Mukerji, Ph.D.
Ruben G. Rumbaut, Ph.D.
Carlos Waisman, Ph.D.

Visiting Assistant Professor:

Joachim Singlemann

Lecturer:

Murray S. Davis, Ph.D.

Sociology at UC San Diego

A major in sociology provides a solid liberal-arts background for entrance into professional graduate study in law, business, and medicine, or for a direct move into occupations involving general urban problems, the field of corrections, community work, and social welfare. For those wishing to continue study in sociology for teaching and research careers, an undergraduate degree from the Department of Sociology will provide recent theoretical and methodological advances in the field. In addition, Sociology 2, which is required of all majors, offers undergraduates the rare opportunity to engage in field research under the guidance of individual faculty members — a chance to explore on their own what they have learned in the classroom.

Many of the courses offered by this department are traditional sociological topics such as deviance, social control and the police, stratification, organizations, health and society, race and ethnic relations, social protest and movements, education, urban problems, colonialism

and imperialism. Nevertheless, like most of the humanities and social science departments at UC San Diego, the Department of Sociology has concentrated its efforts on developing and teaching innovative approaches to these traditional topics. In line with this philosophy, we offer courses found in few sociology departments across the country, such as sociolinguistics, the sociology of everyday life, and myths and symbols in society. Moreover, this department actively encourages its majors to take courses in other social science disciplines (see "The Major Program for Undergraduates") in order to broaden their perspective and grasp of various subject matters. In general terms, the department stresses a comparative-historical approach to sociology, field studies of everyday life settings, and the sociology of culture. Quasi-experimental work and survey research are available also and are pursued by several faculty members.

A total of fifteen sociology courses is required for the major. Of these the student must take eight required courses — three lower-division and five upper-division. The remaining seven are upper-division electives.

Regulations of the Department of Sociology are flexible, and we do make exceptions if we are shown good academic reasons for doing so. However, the faculty members feel strongly that a thorough and balanced program is important for undergraduate studies, and they have designed this program accordingly. Special courses may be petitioned for by individuals or groups who wish to undertake independent or group study projects in consultation with a sociology faculty member.

Transfer students should see the undergraduate secretary or the undergraduate adviser during their first quarter at UC San Diego in order to petition to have their sociology courses from other colleges accepted to apply toward their majors here.

In addition to declaring their majors on the IBM card during registration, all students wishing to major in sociology must fill out the Application for Major in Sociology form available in the Department of Sociology office, 7001 H&SS. The department will then keep an up-to-date record of their progress toward the degree.

It is preferable that students not declare their majors until after having completed the required lower-division courses in sociology.

The Major Program for Undergraduates

The following is the required program for undergraduates with a major concentration in sociology:

A total of fifteen courses in sociology (three lower-division, twelve upper-division), including the required courses listed below. A 2.0 grade-point average in the major. (F's are not applicable toward the major.)

Lower Division

Sociology 1A, 1B (Sociological Analysis), and 2 (Sociological Research). This sequence is required for most upper-division sociology courses in sociology and should be taken during the freshman or sophomore year, but need not be taken in sequence. It is preferable that students not declare their major until after having completed these required lower-division courses. Once they have declared their major in sociology, however, students must complete all three of these lower-division courses within one year if they have not already done so. Students who have had one year of sociology in an accredited institution of higher education may petition for exemption from Sociology 1A and 1B if those courses are equivalent. Sociology 10 (American Society) is *not* accepted for credit toward the major.

Upper Division

Any one course from each of the following cluster areas:

- A. Social psychology and interaction: 100, 102, 103, 106, 109, 117, 163.
- B. Social organization and institutions: 110, 111, 112, 113, 116, 124, 134, 173.
- C. Social control and social problems: 120, 121, 122, 123, 128, 140, 142, 143, 146, 166, 178, 179.
- D. Social change, development and comparative sociology: 114, 118, 130, 135, 138, 139, 141, 144, 145, 147, 164, 167, 168, 169, 170, 171, 174, 175.
- E. Social bases of culture and knowledge: 105, 108, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 160, 161, 162, 183, 184, 185, 186, 187, 188.

Students may complete Sociology 181 (Statistical Analysis of Sociological Data), in lieu of one of the above cluster areas.

It is strongly recommended that among the courses offered for concentration the student include at least *one* senior seminar (Sociology 190). Such a seminar may be included in the appropriate cluster area.

No courses taken to apply toward the major may be taken on a Pass/Not Pass basis except Sociology 198 (Directed Group Study) or 199 (Independent Study). Only *one* independent study course may be applied toward the major. Independent study 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 undergraduate secretary for the necessary application forms and deadlines.

In fulfilling the major, students may take up to three upper-division courses from the regular offerings in the Departments of Anthropology, Economics, History, Linguistics, Political Science, Psychology, Urban and Rural Studies, macro and micro areas of Communications, and the Elementary Aide Program courses through the Teacher Education Program (one course only). Courses from departments other than these may be taken if the student submits a petition to the Department of Sociology and thereby obtains permission to have such courses approved for the major.

The Graduate Program

Admission

The Department of Sociology offers a course of study leading to the Doctor of Philosophy degree. The department offers no special program leading either to the master's degree or to a graduate degree in social work.

Along with their application, applicants are requested to submit a term paper or other examples of their own written work, Graduate Record Examination (GRE) scores, transcripts, and letters of recommendation. Applicants are also encouraged to visit the department to talk with faculty and graduate students. The deadline for filing applications is January 15.

New graduate students are admitted only in the fall quarter of each academic year. The first year of the department's graduate program is largely devoted to a required sequence of "core" courses, and entering students generally go through this sequence as a cohort.

Students interested in an interdisciplinary Ph.D., with a concentration in sociology, can refer to the program on Comparative Studies in Language, Society, and Culture.

Program of Study

The Core Curriculum Sequence

The "core curriculum" is a group of seven courses (courses numbered from 240 to 246) distributed over four quarters. Three of these courses cover the history of sociological theory, and four of them deal with methods of research. The core curriculum is designed to introduce graduate students to some of the major issues in sociological theory, to some of the important research undertaken to test or exemplify theories, and to some of the methods and techniques used in such research. The core curriculum is also designed to provide students with the opportunity to conduct their own research, using methods of data collection and analysis such as participant-observation, field-study observation, historical and documentary methods, survey-data collection and analysis through interviewing and questionnaires, and the use of appropriate statistical techniques.

Each quarter of the first year, students are required to enroll in one core course in theory, one in methods, and one selected readings course. In addition, the fourth core course in methods is taken in the fall quarter of the second year.

Effective fall, 1978, graduate students who transfer from other universities and have received either a master's degree or its equivalent may petition to omit core curriculum courses that appear to repeat work they already have completed successfully.

The Core Curriculum Examination

At the end of the spring quarter first-year students will take written examinations on the content of the core curriculum courses taken in the first year. The purpose of this examination is to assess the students' comprehension of the materials offered in the core curriculum and their mastery of fundamental sociological concepts. Students who are granted core curriculum course exemptions will not have to take those portions of the core curriculum examination dealing with the waived areas.

Each student will then receive from the department a written evaluation of his or her performance in the examination and in course work during the year.

Preparation for the Orals Qualifying Examination

Before taking their preliminary oral qualifying examinations for the Ph.D., students must, in addition to the core curriculum, take four substantive seminars. With the approval of the adviser, one of these may be in a related discipline. It is also recommended that students take at least three courses outside the department in order to broaden their knowledge of fields related to sociology. By the end of the second year, in consultation with their faculty advisers, students will be expected to have selected three subfields within the field of sociology in which to specialize. No specific courses are prescribed for specialization since these will be arranged by combinations of seminars, tutorials, and independent studies.

The three main areas currently available include:

- 1. Microsociology** (which includes ethnomethodology and symbolic interactionist approaches). The department offers courses on symbolic interaction, sociolinguistics, cognitive sociology, ethnomethodology, and the sociology of everyday life. Graduate students can study field methods, sociolinguistic analysis, interview techniques, and the use of video and audio tape equipment. Substantive areas of interest include: medical sociology, marriage and the family, alcoholism, deviance, classroom interaction, and religion.

- 2. Sociology of Culture** (both mass culture and high culture). Our faculty study cultural systems in Europe, the United States, 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, prerevolutionary Russia, and several Latin American countries. Substantive topics have included socioeconomic and sexual stratification, class structure, theories of development, the relationship of ideology to social change, the origins of the modern penal system, comparative social movements, and the methodology of comparative historical research.

In addition to gaining competence in three sub-fields of sociology, students will be expected to have initially explored a potential dissertation topic before taking their preliminary oral examinations.

For Ph.D. candidacy, the department requires a minimum of three consecutive quarters of residence, with a minimum registration of nine units per quarter.

The department also recommends qualified students with no teaching experience to seek teaching assistantships with the department or in closely related disciplines.

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 proposal. Papers in one or more of the specialized areas may be required of the student. Typically the qualifying examination is taken during the third year of graduate work. The department will grant a Candidate in Philosophy degree to students after they pass the oral qualifying examination.

Dissertation Research and Preparation

The nature and requirements of dissertation research vary greatly depending upon the specific problem chosen. Before work on the dissertation can proceed officially, a formal meeting must be held during which the doctoral candidate discusses the thesis proposal with his or her committee and obtains its approval. Following this, the student should remain in frequent consultation with the committee. When the dissertation is substantially completed, the dissertation defense then takes place at a meeting with the student's doctoral committee.

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.

Courses

Lower Division

1A-B. Sociological Analysis (4-4)

An introduction to the major ideas, concepts, and methods in the study of societies, social interaction and social structure, the construction and acquisition of social roles and organizations, major institutions, and processes of change.

2. Sociological Research (4)

A survey of major research procedures used by sociologists for studying historical and contemporary everyday activities. *Prerequisites:* Soc 1A-B

10. American Society (4)

An introduction to American society in historical and world perspectives, touching on the following topics: the American cultural 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.

Upper Division

Prerequisites: Sociology 1A-B, Sociology 2, or consent of instructor. Additional prerequisites may be specified below.

100. Sociology of Everyday Life (4)

A general introduction to the objective observation, description, and analysis of everyday life. The aim of the course is to demonstrate the theory and method of observation by which studies of everyday experience become information basic to the study of society.

101. Sociological Investigations (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. Students will write a paper using these methods. (Not offered in 1980-81.)

102. 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, will be considered.

103. Acquisition of Communicative Competence (4)

The socialization of children is viewed as the acquisition of communicative competence including social rules and values. The cultural and linguistic knowledge involved in the acquisition of membership in various social groups is discussed. Several modalities of communication are examined including the visual, auditory, and kinesic.

105. Popular Culture (4)

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.

106. 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.

108. Sociology of Culture (4)

A study of the concept of culture, its origins and its applications primarily to modern societies. Included will be discussions of the role in society of various symbolic systems, such as art, science, myths, history, language.

109. The Individual and Society (4)

Reciprocal influences between the individual and society will be investigated from a variety of perspectives. The nature, formation and destruction of the social self in family, group, and larger social units will be emphasized.

110. 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.

111. Organizations (4)

Determinants of organizational structure, the effects on organizational and individual behavior. Formal and informal structures, effects on goals and values. Industrial organizations, governments, voluntary associations, schools, prisons, hospitals, communities as organizations, professions and the organization of science.

112. 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.

113. Occupations and Professions (4)

Analysis of the social organization of work in modern societies, the concept of career, the development of professionalization. Occupational subcultures, work, leisure and alienation; social relationships of work groups in organizations; human relations in work situations, professional and occupational associations.

114. Soviet and American Societies (4)

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.

116. The Social Organization of Education (4)

A consideration of the social organization of education in American and other societies; the relationship between socialization and education; the influence that culture has on education; the structure of schools at present in the United States; the educational decision-making phenomenon; evaluation of alternative models of education; suggestions for educational programs that are cross-culturally sensitive, developmentally sound, and student centered, education for critical consciousness.

117. Classroom Interaction (4)

Sociolinguistic principles are applied to the study of classroom communication. 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 classroom presentations and student projects.

118. Comparative Educational Sociology (4)

The organization of education in a number of historical and contemporary societies, such as ancient Greece and Rome, medieval Europe, traditional China, India, and Japan, and contemporary United States, Russia, England, France, and Germany. Education will be examined in terms of its internal organization and in relation to religious and secular ritual and ideology, to stratification, economics, and politics. (Not offered in 1980-81.)

120. Urban Social Problems (4)

Concerns the facts and theories of contemporary social problems in urban America. The emphasis will be on social problems, not on urbanism.

121. Sociology of Deviance, Law, and Crime (4)

Concerns the fundamental problems of rule-making and the use of rules, especially laws. Such subjects as addiction, marijuana use, and suicide will be considered.

122. Sociology of Law (4)

Functions of law in society, social source of legal change, social conditions affecting the administration of justice; role of social science in jurisprudence.

123. Sociology of 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. (Not offered in 1980-81.)

124. 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.

128. Sociology of Death (4)

A survey of the relationships between mortality and the social characteristics of the individual and his or her environment. (Not offered in 1980-81.)

130. Sociology of Development (4)

A sociological perspective on problems of development and modernization in formerly nonindustrial societies. An analysis of interactions between the old and the new social structures and processes and the social implications of various selected strategies in social planning for emergent institutions.

- 134. The City of San Diego (4)**
A research-oriented course on the institutions and subcommunities of San Diego. Readings will be drawn from the sociological studies of urban communities and from studies on the political structure of American cities. Lecturers will include people from the political and planning agencies of the city and its subcommunities. Students will work on individual or joint projects.
- 135. Comparative Race and Ethnic Relations (4)**
An historical and comparative analysis of race and ethnic relations in the United States, Western Europe, and Asia. The course will analyze the origins of slavery, the various approaches to minority community development, and the causes and consequences of discrimination and prejudice in various national settings.
- 138. Comparative Institutional Sociology (4)**
Classical and contemporary treatments of long-term and large-scale social processes. Topics include war and the structure of the state, economic development and decay, religion, and secular ideologies. (Not offered in 1980-81.)
- 139. Political Modernization Theory (4)**
A survey of approaches to the study of modernization. Processes of the development of capitalism, industrialization and urbanization will be examined. The way in which these processes affect mobilization, incorporation, assimilation, legitimacy and the institutionalization of political regimes will be studied.
- 140. 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.
- 141. Culture Conflict and Politics (4)**
The effects of conflicts between cultural groups on political processes and institutions in old and new nations. Topics include the implications of changing moral styles on political issues, the significance of ethnic and religious conflict on politics; the influence of cultural diversities in national development; and the impact of cultural and linguistic movements.
- 142. 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.
- 143. Power in American Society (4)**
The concept of power: definitions, types, and social locations. Review of the literature on power structures, local and national, in the United States. Evaluation of the several approaches to power structure (pluralist, power elite, ruling class). Analysis of such related topics as normal politics vs. crisis politics and agencies of change in American politics.
- 144. 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.
- 145. 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 polity, the community, and kinship institutions.
- 146. Equality and Inequality (4)**
Equality and elitism as persistent issues in modern societies. Materials from philosophy, history, and social sciences as used to define and describe current arguments and existing patterns of political power, popular and high culture, educational equality, and the distribution of income.
- 149A. 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.
- 149B. 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 socio-cultural attitudes.
- 150. History of Social Thought (4)**
Major figures and schools from early nineteenth century through the present, including Comte, Marx, Tocqueville, Spencer, Durkheim, Weber, Simmel, Freud, Sumner, Mead, Park, Parsons, and Mannheim.
- 151. 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.*
- 152. Myth and Symbols in Society (4)**
A study of the contribution of mythical symbols and narratives to the establishment of social meanings and behavior in primitive and modern societies. Included will be a review of different theories of myth and narrative, such as those of Levi-Strauss, Cassirer, and Propp.
- 153. Sociology of Knowledge (4)**
The analysis of political ideology and its relationship to forms of scientific thought, especially of the social sciences. The analysis of the social influences and institutions affecting the development and transmission of knowledge, including the analysis of universities, communications agencies, and markets for popular and high culture.
- 154. Sociology of Mass Media (4)**
This course will be concerned primarily with the techniques and social methods of constructing the news. It will be especially concerned with the news of the newspapers and television. It will also deal with how men and women construct the news; the effects of their messages on the public and other important subjects, such as the effects of ownership patterns on the messages of the news media.
- 156. 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.
- 157. Culture, Science, and Society (4)**
The impact of science as an ideology and an institution on modern American society. Discussion will include the political use of science, the organization of research, and the effect of science on American culture.
- 158. Sociology and Drama (4)**
The ways in which dramatic metaphors (e.g., the dramaturgical model, the concept of social drama, and the concept of frame) have been applied to the study of human interaction. Also, the ways in which the detailed study of nonverbal behavior (kinesics and proxemics) can be applied to theory and practice in theater.
- 159. Collective Behavior (4)**
An inquiry into the sources, character, and consequences of such mass phenomena as fashions, fads, and other abrupt shifts in a society's collective moods and tastes, i.e., all those "eruptions" which seem to occur outside the main institutional spheres of life, but which nonetheless, may have an important impact upon them.
- 160. Sociology of Intellectual Life (4)**
Sociological analysis of the intelligentsia, types of intellectuals, 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.
- 161. Work and Leisure (4)**
Historical and comparative analysis of problems associated with quality of work and quantity of leisure, impact of cultural and social change on occupational pattern and leisure activity.
- 162. 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.
- 163. Ethnographies: Their Uses and Analysis (4)**
This course will analyze the methods and underlying assumptions of field observation and ethnographic reporting. It will contrast various types of written and audiovisual ethnographies, critically examine their styles, approaches, and uses as a form of sociological analysis, and provide opportunities for their application.
- 164. Society in Latin America (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.
- 166. Comparative Health Systems and Practices (4)**
A cross-cultural inquiry into modes and practices of health care and health-care delivery in a variety of contemporary and historical societies. The course aims to develop an enhanced appreciation of prospects and problems of health planning in the United States.
- 167. Culture, Contact and Change (4)**
Analysis of patterns and problems of socio-cultural persistence and change, with a special focus on the impact of the West on Third World societies. (Not offered in 1980-81.)
- 168. Socio-Economic Change in Developing Areas (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.
- 169. Social Change (4)**
A general introduction to processes of change in modern societies and new nations. Major theories of change, major contemporary trends, conflicts and movements of change, role of technology, ideas, and institutional change.
- 170. Comparative Rural Societies (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 ones.
- 171. Women in Cross-Cultural Perspective (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 U.S.A., and the political economy of sex stratification.
- 173. Sociology of Men (4)**
This course will explore the sociology of sex and gender from the perspective of what it means to talk about "mankind." The course will explore the physiological, biochemical, psychological, and sex-role aspects of sex and gender in an attempt to separate what is distinctively social about male identity.
- 174A. Population and Society (4)**
An introductory study of the relationship between population and other segments of society. A brief overview is given of the history of world population growth in the United States. The three main demographic components: fertility, mortality, and migration, will be studied and their combined effects on the structure of population discussed.
- 174B. Population and Society (4)**
A more advanced analysis of the relationship between population and society. The topics to be covered may include all or some of the following: food and population; population and economic development; population and social change; and population policies.
- 178. 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.

179. Sociology of Mental Illness (4)

An examination of the social, cultural, and political factors involved in the identification and treatment of mental disorders in American society.

180. Survey Research Design and Elementary Analysis

Course will cover translation of research goals into a research design, questionnaire construction, sampling, data collection including interviewing techniques, coding and tabulation, elementary multivariate analysis, table construction, and report writing. Statistical methods of analysis will be limited primarily to percentaging. *Prerequisite: one upper-division course in a substantive area.* (Not offered in 1980-81.)

181. Statistical Analysis of Sociological Data (4)

A problem-centered course, emphasizing the correct application of elementary statistical techniques to actual sociological data. The course will cover statistics commonly used in sociological analysis (binominal, t-test, Chi-squared, regression, correlation). *Prerequisites: Math. 1A-B or an introductory statistics course or consent of instructor.*

183A. The Culture of Cities (4)

The urban world as the source and stage of particular forms of imagination, human types, manners, taste, sentiment and intellectual outlook. The presumed "naked rationality" and "anonymity," and the city as a new "folk" system and the arena of individualism and "creativity." The time and visual qualities of urban life and their relationship to the character of personal communication and "views of life." The rituals, ceremonies, and imagery of urban life. The course will rely, not only on sociological, socio-psychological, and historical accounts, but also make ample use of literary accounts (novels, short stories). Literary and artistic sources will be both European and American, "classic" and modern. A number of "great" cities, Paris, New York, London, Venice and Florence, among others, will be given particular attention. (Not offered in 1980-81.)

183B. The Culture of Cities (4)

A comparison of "tribal," "folk," "pastoral," and "village" communities and urban life. Review (and critique) of traditional views of urban culture as "impersonal," "destructive of identity," dominated by "mass conditions" and "bureaucratic manipulation," etc. Types of cities. The city as the stage for the emergence of special social traditions, folkways, and cultural and personality styles. In addition to sociological writings, the course will make use of literary descriptions and artistic illustrations of city life. (Not offered in 1980-81.)

185. 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.

187. Films and Society (4)

An analysis of films and how they portray various aspects of American society. (Not offered in 1980-81.)

188. Sociology of Visual Knowledge (4)

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 discussions 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.

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.

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 or independent and group studies. These studies are to be conducted only in areas not covered in regular sociology courses. *Prerequisite: upper division standing or 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. *Prerequisite: upper-division standing or permission of department.* (P/NP grades only.)

Graduate

200. Analyzing Everyday Life (4)

A graduate seminar in the objective observation, description, and analysis of everyday life. This seminar will systematically examine phenomenological, ethnomethodological, and existential theories of society, in contrast to structural theories. (S/U grades permitted.) (Not offered in 1980-81.)

206. 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 investigation and theories of social cognition and behavior. (S/U grades permitted.)

210. Social Psychology of Health and Illness (4)

A close-in examination of the effect of cultural, social structural, and interactional factors in the diagnosis, treatment, and outcome of illness experiences in contemporary society. Class discussions are organized around a series of readings designed to parallel the phases of the natural history of an illness.

212. 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. Graduate students will be assigned an additional research paper and/or examination of more complex material and design. (S/U grades permitted.)

213. Alcohol and Society (4)

This course will be concerned with (1) the macro-sociology of alcoholism — the societal response to over-imbibing and problem drinkers, (2) the micro-sociology of alcoholism — interaction of alcoholics with professionals, with relatives, employers, and friends, and with each other either in the development of various drinking cultures or in biographies of their experience; and (3) the research projects of students of this course and with the interim or progress reports they present in class. (Not offered in 1980-81.)

214. 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.

215. Seminar in Political Sociology (4)

Research and readings in sociological analysis of political institutions. Readings on politics and stratification power structure. Political elites, conflict groups, participation. Student research in selected areas. (S/U grades permitted.) (Not offered in 1980-81.)

223. Social Problems (4)

Facts and theories about social problems and possible solutions to them will be analyzed.

235. Comparative Race and Ethnic Relations (4)

An historical and comparative analysis of race and ethnic relations in the United States, Western Europe, and Asia. The course will analyze the origins of slavery, the various approaches to minority community development, and the causes and consequences of discrimination and prejudice in various national settings. (S/U grades permitted.) (Not offered in 1980-81.)

240. Pre-Modern Sociological Theory (4)

Major figures and their ideas in the history of social thought prior to the late nineteenth century classicists.

241. Modern Sociological Theory (4)

A comparative examination of major themes of such classical sociological theorists as Marx, Durkheim, Weber, Simmel, G. H. Mead, and Park.

242. 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.

243. 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.

244. Socio-Linguistic and Micro-Sociological Methods (4)

The analysis of communication materials using sociolinguistics, psycho-linguistics, and the methods of ethno-science as well as general question-answer systems as they are related to the logic of social inquiry.

245. Survey and Demographic Methods (4)

The 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.

246. 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.

260. Ethnomethodology (4)

Analysis of sociology's relation to genetic and subjectivistic approaches to behavior. Discussion of hierarchical systems and corresponding levels of theory.

261. Social Structure (4)

An analysis of structuralist and phenomenological ideas of structure. Discussion of the differences between major theorists, such as Levi-Strauss, Piaget, Merleau-Ponty, and Gurwitsch. Emphasis on their influences on modern sociological research. (Not offered in 1980-81.)

262A. 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.

262B-C. 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 organization settings. (Not offered in 1980-81.)

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.)

292. Selected Readings in Sociology (2)

Year-long seminar. Discussion and analysis of research problems and issues under investigation by departmental faculty. Readings will vary depending upon the instructor. This seminar may be repeated for credit and is required of first-year graduate students for at least two quarters. (S/U grades only.)

297. Directed Group Study (4)

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.

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 (1-12)

Open to graduate students engaged in thesis research. (S/U grades permitted.)

500. Apprentice Teaching (2)

Supervised teaching in lower divisional contact classes, supplemented by seminar on methods in teaching sociology. (S/U grades only.)

SUBJECT A

OFFICE: 2346 Humanities and Social Science Building, Muir College

Adela B. Karliner, M.A., *Lecturer and Supervisor of Subject A*

During the first year of residence, each student must enroll in the appropriate writing course for his or her particular college.

Third College: Third College Composition Program 10B-C
 Warren College: Warren College 10A-B
 Muir College: Muir College 10
 Revelle College: Humanities 10A-B-C, 11A-B-C, 12A-B-C

Successful completion of one of these sequences will satisfy the Subject A requirement.

See also "Subject A" under "Admissions."

TEACHER EDUCATION PROGRAM

OFFICE: Third College Humanities Building, Third College

Hugh Mehan, Ph.D., *Associate Professor of Sociology (Director of the Program)*

Jean M. Mandler, Ph.D., *Professor of Psychology*

Gloria Fimbres, *Supervisor of Student Teaching*

Cynthia Lawrence-Wallace, *Supervisor of Student Teaching*

Randall J. Souviney, Ph.D., *Supervisor of Student Teaching*

The Program

The Teacher Education Program (TEP) is a campuswide program physically located at Third College. It is designed to provide the UC San Diego student with a "preliminary" multiple subjects credential within the framework of existing academic departments. There is no school of education at UC San Diego. Students who satisfy program requirements will graduate from UC San Diego with a complete major in their selected field of specialization as well as a "preliminary" multiple subjects credential. A teacher may teach for five years with a preliminary credential. To obtain a "clear"

multiple subjects credential in California, the teacher must complete a fifth year of college within five years of the B.A. or B.S. and teach successfully for two years.

The main themes of the TEP are multicultural and child-centered education. A multicultural education is pluralistic; it recognizes the unique heritage of different cultures and seeks to preserve each child's cultural identity while providing the child with skills necessary to move between different cultural systems if he or she chooses to do so.

A child-centered education is constructed to be consistent with each child's developmentally acquired ability to learn. Current research in comparative cultures, comparative child development, and social interaction will provide the prospective teacher with insight into the relationship between language, culture, and education.

Because of the recognized need for bilingual/biliterate teachers, both locally and nationally, the TEP offers a bilingual emphasis within its four-year course of study. Students who plan to become bilingual educators follow the existing program's curriculum with some modifications. These include achieving a second language proficiency (as determined by the UC San Diego language lab and a TEP committee) and preliminary field work and student teaching in a bilingual classroom. Upon completion of the bilingual emphasis curriculum, students receive a certificate indicating their bilingual competencies in addition to the preliminary multiple subjects credential and the bachelor's degree. Students who are interested in the bilingual emphasis should contact the TEP office for more information.

Curriculum

The state of California requires that the teacher in the elementary school be prepared to teach all courses normally offered in the elementary school. This necessitates professional preparation as well as practical experience in the classroom. The TEP will meet these requirements in the following ways:

Academic Area Requirement

The academic area requirement is intended to provide the prospective elementary school teacher with training in the subject matter usually taught in the elementary school. This is *not* a substitute for the student's regular major. The teacher candidate must take a minimum

of five four-quarter unit courses in *each* of the following areas: (1) mathematics and science, (2) English, (3) social sciences, and (4) humanities, foreign languages, and fine arts. University general-education requirements at UC San Diego satisfy many of these requirements. Courses are offered in each of these four areas which enable the teacher candidate to work as a classroom aide in the respective discipline in a local school. (See *TEP 181A, B, C [two are required]*.) The classroom aide experience is seen as an excellent vehicle for learning about the learning processes and interpersonal communication involved in a teaching relationship.

Professional Preparation

The state requirement for professional preparation will be met by offering eighteen quarter hours of courses which deal with the sociology of education and innovative instructional practices. Details of these courses follow in the course listing.

Practical Classroom Experience

The teacher candidate will student-teach for the equivalent of one elementary school semester. During this time the candidate will be given thorough, realistic, and practical experience in classroom instruction, and will be given continuous and diversified responsibilities in the school. The teacher candidate will engage in classroom observation, course preparation, actual teaching, and student evaluation. Concurrent with student teaching, the teacher candidate must take TEP 191C, described below.

Student Selection

Students interested in applying to the TEP will be advised in the spring of their sophomore year as to what courses they should take in their junior year, at which time the actual coursework for the TEP begins. Student performance in these courses will be a factor in program selection. Other criteria for admission to the program include:

1. A strong interest in multicultural approaches to education; a strong desire to improve the quality of American education; a strong desire to instruct students as self-activated learners.
2. Experience working with students in educational environments, especially in multicultural settings.
3. Community involvement.
4. Academic excellence.

Third College Composition

Prospective candidates for the TEP will be carefully reviewed by a diversified committee composed of faculty, staff, and students. Provisional acceptance into the TEP will take place *during* the student's junior year, prior to student teaching.

Courses

All of the following courses are required toward the "preliminary" multiple subjects credential. Students are advised to consult with TEP staff to determine how they can best fulfill the academic area requirement.

Sociology 116. The Social Organization of Education (4)

A consideration of the social organization of education in America and other societies; the relationship between socialization and education; the influence that culture has on education; the structure of schools at present in the U.S.; the educational decision-making phenomenon; evaluation of alternative models of education; suggestions for educational programs that are cross-culturally sensitive, developmentally sound, and student-centered; education for critical consciousness. *Prerequisites: Soc. 1A-B or Soc. 2 or consent of instructor.* (F)

Psychology 130. Developmental Psychology and Education (4)

An introduction to the child's cognitive, perceptual, linguistic, and social development with emphasis on his or her relation to education. Piagetian, information processing, and cross-cultural difference in relation to education and the nature of the learning process in relation to success and failure in the schools. *Prerequisite: consent of instructor.* (W)

Sociology 117. Classroom Interaction (4)

Application of sociolinguistic principles to the study of interaction in classroom and educational testing situations. Development of techniques of observation and methods of analysis that are applicable to interactional settings in general, school settings in particular. Interaction from classroom and testing situations will be presented by way of transcripts and videotape. Topics important for the classroom and methods for their analysis will be discussed. *Prerequisites: Soc. 1A-E or Soc. 2 or consent of instructor.* (S)

TEP 180. Practicum in Student Teaching (16)

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 September and will spend at least five hours a day, four days a week for fifteen weeks in the classroom as well as prepare courses, have parent-teacher conferences, and teacher-principal conferences. During this time the candidate will be given thorough practical experience in classroom instruction and continuous and diversified responsibilities. *Prerequisites: affirmed TEP candidacy and concurrent registration in TEP 191C.* (F)

TEP 181 A-B-C. Practica in Learning (4-4-4)

The primary focus of these courses will be on the teaching-learning process in elementary schools. UC San Diego students are assigned to instruct a small number of elementary school students under the supervision of participating teachers in local schools. The UC San Diego student will instruct children in reading, ESL, English, Spanish, social science, math, science, history, or fine arts, at least four to six hours per week. Concurrent with field activity, the UC San Diego student will be involved in course work concerning theories of learning, multicultural education, social organization of education. *Prerequisite: consent of instructor.* (F,W,S)

TEP 191A. Innovative Instructional Practices (6)

This is one of a three-course sequence providing a theoretical and practical grounding in various pedagogical techniques which are consistent with the child's developmentally acquired ability to learn. Typically diverse subject areas are integrated into a single intercurricular course of study by emphasizing activity inquiry techniques of instruction. *Prerequisite: affirmed teacher candidacy.* (W)

TEP 191B. Innovative Instructional Practices (6)

This is one of a three-course sequence providing a theoretical and practical grounding in various pedagogical techniques which are consistent with the child's developmentally acquired ability to learn. Typically diverse subject areas are integrated into a single intercurricular course of study by emphasizing activity inquiry techniques of instruction. Students pursuing the bilingual emphasis are provided instruction in bilingual teaching techniques within the framework of the course. *Prerequisite: TEP 191A.* (S)

TEP 191C. Innovative Instructional Practices (2)

This is one of a three-course sequence providing a theoretical and practical grounding in various pedagogical techniques which are consistent with the child's developmentally acquired ability to learn. Typically diverse subject areas are integrated into a single intercurricular course of study by emphasizing activity inquiry techniques of instruction. *Prerequisites: TEP 191A-B and concurrent registration in TEP 180.* (F)

TEP 192. Building a Bilingual Program in the Classroom. (4)

This course teaches the history and models of bilingual education methods of instruction for bilingual classrooms; teaching in content areas; curriculum development, especially in language arts; technical teaching vocabulary; integrating bilingual and multicultural educational approaches. *Prerequisite: affirmed TEP candidate or consent of instructor.*

TEP 193. Multicultural Education (4)

An historical overview of cultural, 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.* (W)

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 specified for each area. Competency 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.*

TEP 195. Apprentice Teaching (4)

Advanced TEP students are prepared in effective methods of supervising the preparation of UC San Diego 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.*

TEP 198. Directed Group Study (4-2)

Directed group study guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.*

TEP 199. Special Studies (4)

Individual guided reading and study involving research and analysis of activities and services in multicultural education, bilingual education, the teaching-learning process, and other areas that are not covered by the present curriculum. *Prerequisite: consent of instructor.*

Elementary Aide Program

The UC San Diego Elementary Aide Program enables students to engage in classroom aide activity in elementary schools. The program provides a vehicle for students to gain practical experience about the learning process in actual classrooms and to relate this experience to theories of interpersonal relations,

cross-cultural communications and education. The courses in the program are open to all UC San Diego students and are particularly recommended for minority students and/or candidates to the Teacher Education Program. The student may serve as an aide for a total of three quarters (the minimum of two are required) (See TEP 181A-B-C above). The prerequisite for all three courses is consent of the instructor.

THIRD COLLEGE COMPOSITION PROGRAM

OFFICE: Third College Humanities

Building (TCHB), Third College

Charles R. Cooper, Ph.D., *Professor of Literature (Director of the Program)*

* * *

The Third College Composition Program (TCCP) provides Third College students with intensive courses in writing and reading in a wide array of discourse types and modes: personal experience narrative, reportage, research, explanation, persuasion. Classes are small and focus on context-building and on pre-writing exercises for what will be written each week. Students engage in peer criticism of writing already completed. Each student is also scheduled for several individual conferences with his or her instructor. Based on placement examination results, students will be placed either in the 10A-B-C sequence or in the 10B-C sequence. A grade of C or better in both 10B and 10C fulfills the Third College writing requirement.

Courses

10A. Composition (4)

A basic course in the writing of explanatory and persuasive discourse. Special attention will be given to achieving consistent control of the correct forms of standard edited English and to increasing sentence variety and fluency. The course will also concentrate on the process of composing in writing and on the nature of written language, especially the differences between informal conversation and writing. Students will write often and revise, engage in peer discussion and critiques of papers, and attend conferences with the instructor.

Extensive readings will be required on various personal and social issues. Students required to take 10A must also take 10B and 10C.

10B. Expository Writing I (4)

A course in the writing of expressive and explanatory discourse, with emphasis on personal experience narrative (autobiography, first-hand biography, chronicle) and on reportage (observations, interviews, case studies). Attention to correctness and to syntactic variety. Special emphasis on the various patterns of narrative and reportage and on personal voice and style. Students will keep a writer's journal, write several pieces of narrative and reportage, revise their writing, engage in peer discussion and critiques of papers, and attend conferences with the instructor. A special feature of this course will be guided practice in various small group discussion activities.

Students will read widely in narrative and reportage.

This course is required of all students in Third College.

10C. Expository Writing II (4)

A course in the writing of explanatory and persuasive discourse. Special emphasis on the various patterns of explanation and persuasion and on the range of strategies available for developing such writings. Particular attention will be given to decisions writers must make about their readers, decisions involving language register, appropriate amount and kind of information, and effective persuasive techniques. Students will write often and revise, engage in peer discussion and critiques of papers, and attend conferences with the instructor. The course culminates with a brief, documented research paper, where students will learn to use the Modern Language Association (MLA) Style Sheet form of documentation.

Extensive readings will be required on current social, economic, and politic issues.

This course is required of all Third College students.

THIRD WORLD STUDIES

OFFICE: Room 121, Third College
Humanities Building, Third College

Professor:

Carlos Blanco-Aguinaga, Ph.D.
(*Spanish Literature, Coordinator of
Third World Studies*)

Associate Professors:

Edward Reynolds, Ph.D. (*History*)
Rosaura Sanchez, Ph.D. (*Literature,
Coordinator of Bilingual Sequence*)
Sherley Ann Williams, M.A. (*Literature*)

Assistant Professors:

Richard J. Arneson, Ph.D. (*Philosophy*)
Ricardo Romo, Ph.D. (*History*)
Marta E. Sanchez, Ph.D. (*Latin
American and Chicano Literature*)
Emory J. Tolbert, Ph.D. (*History*)

Acting Assistant Professor:

Carlos Waisman, M.A. (*Sociology*)

Adjunct Professor:

Leften S. Stavrianos, Ph.D. (*History*)

The Third World Studies Program has three main objectives:

1. To provide a perspective on world affairs and problems which has not been historically available — namely, an understanding of the Third World and of its relationship to the West from a Third World perspective. In order to understand this perspective, it is necessary to see how the West has viewed and presently views the Third World. Thus, the program becomes totally inclusive. 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.
2. To provide a means of cutting across disciplinary lines in order to integrate

past and present knowledge concerning the Third World and its relationship with the West. The program is not conceived as being exclusively historically oriented nor as being predominantly a social-science program, but rather one that synthesizes *both* the social sciences and the humanities.

3. To provide an understanding of the relationship between internal Third World societies (Asian-American, Black, Chicano, and Native American) and external 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, as well as in their evolution to independence and nationhood in the twentieth century. There is insistence on both the similarities and differences which Third World societies have among themselves and the similarities and differences with Western societies.

The Major Program

Students interested in the area of 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 1A-B-C, 7A-B-C, or TWS 21, 22, 23). Selection of a specific concentration, discipline, or department should be determined in consultation with a Third World Studies faculty member.

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. Students should consult a Third World Studies faculty member for approval of a major program. 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 a discipline dealing with the Third World.

The Third World Studies faculty offers courses in the Departments of Literature, Sociology, History, Philosophy, and in the

Third World Studies Program. Students should consult appropriate 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**1A. History of the Third World to the Nineteenth Century (4)**

Definition of the Third World, its origins in the fifteenth century, its historical evolution into a global system by the nineteenth century, and the nature and consequence of its relations with the European metropolis. (F) (Not offered in 1980-81.)

1B. History of the Third World in the Twentieth Century (4)

Impact on the Third World of the two World Wars and of the Russian and Chinese Revolutions. Winning of political independence, problems of economic dependence, and current conditions and prospects. (W) (Not offered in 1980-81.)

1C. History and Cultural Development in the Third World (4)

The colonization and conquest of Third World peoples by the West were accompanied by certain ideological assumptions which negated the equal human status of the colonized, devalued their indigenous cultures, and negated the validity of their past. The struggle of Third World peoples against colonization has therefore necessarily implied the negation of these assumptions, through political struggle and through cultural movements — popular, native religions, popular culture, theoretical formulations, the rewriting of history, and the creation of art and literature. (S) (Not offered in 1980-81.)

7A-B-C. Race and Ethnicity in the United States (4-4-4)

A lecture-discussion course on the comparative ethnic history of the United States. Of central concern will be slavery, race oppression, mass migrations, ethnicity, city life in industrial America, power, and protest in modern America. Attention is focused on Native American, Mexican American, the black, Asian-American, and white ethnic groups. (FWS)

10. Institutions of Third World Societies (4)

A survey of precolonial Third World social and cultural systems, with emphasis on the family, the political and economic institutions, and their interrelationships. (Not offered in 1980-81.)

11. The Third World and Europe (4)

An introduction to theories and paradigms of social and cultural change through a study of contact and exchange between Europe and the Third World, with special attention to the development of new institutional forms and social patterns. (Not offered in 1980-81.)

12. Development in the Third World (4)

An analysis of development in the Third World, with special emphasis on social and economic change.

21-22-23. Literature and History: The Third World (4-4-4)

An analysis of a major theme common to selected ethnic literature in the United States and to certain literatures of the Third World. The course is organized around major literary genres. Themes vary from year to year. (FWS)

Fall: *Literary Forms and the Third World*

Winter: *Fiction and the Third World*

Spring: *Drama, Poetry, and the Third World*

43. Introduction to African Politics (4)

The differential impact of British, French, Portuguese, and Belgian colonialism is examined along with the African nationalist responses which developed during the second half of the twentieth century. (Not offered in 1980-81.)

Limited to freshmen and sophomores, upper-division students with consent of instructor.

Upper Division

101A. History and Theory of Imperialism (4)

The course is an introduction to Western expansion and colonization of the Third World, the rise of capitalism, and the meaning of imperialism as the foundation of the common modern historical experience shared by all Third World peoples. It fulfills the Third College general education requirement in Third World studies and, as such, can be taken as a complete one-quarter course or as part of a three-quarter sequence. A required prerequisite for all Third World studies majors. Students who have completed 1A will not receive credit for 101A. *Prerequisite: upper-division standing* (Not offered in 1980-81.)

101B. Social Change in the Third World (4)

An analysis of social relations in colonial institutions with special emphasis on the impact of alien dominations on the cultures, and self-definition of colonial subjects. *Prerequisite: upper-division standing* (Not offered in 1980-81.)

101C. Modernization, Revolution, and Authorization (4)

This course will be an examination of the different political consequences of modernization — liberal democracy, right-wing authoritarian and fascist regimes, and socialist regimes. The course will aim at testing propositions that link different types of industrialization with the emergence of these outcomes. An effort will be made to inquire at which stages of modernization, and in which type of social structures, each of these regimes is more likely to succeed. *Prerequisite: upper-division standing* (Not offered in 1980-81.)

102A. The U.S. Territorial Expansion Policy and its Effect on Indian Removal: 1492-1865 (4)

This course will cover the territorial expansion of the U.S. and the forced removal and conflict during the years 1492 to 1865. The Indian Removal Act of 1830 and the Civil War will be discussed in detail. (Not offered in 1980-81.)

102B. The U.S. Territorial Expansion Policy and its Effect on Indian Removal: 1865 to the Present (4)

This course will cover the history of the Native American from 1865 to present. The major topics to be discussed are: (1) Indian participation in the Civil War; (2) the assault against the Plains Indians; (3) the treaty period; (4) the Reservation Period; (5) Indian participation in World War I and World War II. Also to be discussed will be major legislation affecting Indians in contemporary times. (Not offered in 1980-81.)

103. The Native American in Contemporary Society (4)

The instructor plans to give the student a working knowledge of problems and issues faced by Native Americans in contemporary society. The major topics will be the Bureau of Indian Affairs, the U.S. Public Health Service, the Relocation System, and Indian Education. (Not offered in 1980-81.)

104. Biographies of Great Native Americans (4)

This course will examine the accomplishments and lives of outstanding Native Americans, both past and present, who have left their mark on history. Students will be required to research the lives and personal accounts of one or more prominent Native Americans and present the details in class. Students will be graded on their classroom presentation, as well as on a term paper resulting from their personal research. (Not offered in 1980-81.)

130. Political Ideology and the Third World (4)

This course studies the concepts of ideology and political consciousness with special attention to their application to the situation of Third World people, abroad and in the black national minority within the U.S.

131. Selected Topics in Latin American Politics (4)

A comparative analysis of contemporary political issues in Latin America. Material to be drawn from two or three countries. Among the topics: nationalism, neoimperialism, political change. *Prerequisite: juniors and seniors only or consent of instructor* (Not offered in 1980-81.)

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, moral, and social/historical/philosophical content of the work read. (Not offered in 1980-81.)

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* (Not offered in 1980-81.)

134. Political Philosophies of Third World Leaders (4)

The course is a study and comparison of the political philosophies of modern Third World leaders. Since a major concern of the course is the problems that such leaders have met with the applications of their theoretical preconceptions to the actual political situations, a biographical approach shall be taken. Particular attention shall be paid to the influence of indigenous non-Western political and religious customs and outlooks on the political viewpoints of the leaders under study.

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* (Not offered 1980-81.)

141. Literary Images of the Black Woman (4)

This course is structured around the idea that there are three basic images of the black woman: that held by society; that held by black men; and the one held by the women themselves. The course will explore all three views with special emphasis on the way black women view themselves. *Prerequisite: upper-division standing* (Not offered in 1980-81.)

153. Introduction to 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 is offered in English. May be repeated for credit as topics vary. *Prerequisite: upper-division standing or consent of instructor*

156. Themes and Motifs in Chicano Literature (4)

The analysis and critical discussion of the principal themes and dominant motifs in Chicano literature, the reasons for their appearance, and their relation to similar and/or different aspects found in other U.S. minority literatures. May be repeated for credit as topics vary. *Prerequisites: speaking and reading knowledge of Spanish and upper-division standing or consent of instructor* (Not offered in 1980-81.)

190. Undergraduate Seminars

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

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 (PNP grades only). *Prerequisites: upper-division standing and consent of instructor* (F.W.S.)

URBAN AND RURAL STUDIES

OFFICE: 235 Third College Humanities Building, Third College

Professor:

Charles W. Thomas, Ph.D. (*Coordinator of Urban and Rural Studies Program*)

Associate Professors:

Robert J. Heifetz, Ph.D.
Faustina Solis, M.S.W. (*Community Medicine*)

Assistant Professor:

Alonzo B. Anderson, Ph.D. (*Psychology*)

Director of Field Studies:

J. Richard Juarez, M.C.R.P.

The Undergraduate Program

The undergraduate program in Urban and Rural Studies is designed to provide a broad educational experience. Persons who wish to become actively engaged in a variety of professional careers can gain skills and understanding of research techniques and other educational and community activities. The multidisciplinary orientation is used to integrate the contributions that the sciences and related professions make to an understanding and solving of urban problems.

The curriculum in Urban and Rural Studies provides students with a broad exposure to theoretical constructs and empirical applications of various disciplines as they relate to the human problems of society. Many basic concepts and perspectives come primarily from the social sciences through URS offerings or in collaboration with existing departments. The goal of the curriculum is to educate action-oriented students who can bridge gaps between disciplines and begin to provide a multidisciplinary synthesis of the complex dimensions of contemporary human experience.

To receive the B.A. degree with a major in Urban and Rural Studies, the student must meet the general-education requirements of Muir, Revelle, Third, or Warren College. The requirements in Urban and Rural Studies follow.

URS majors must complete the following lower-division courses:

1. URS 30: Introduction to Urban Studies
2. Mathematics 6A and 6B or more advanced mathematics (Note: More advanced mathematics, e.g., Mathematics 1 or 2, and calculus sequence are recommended for students planning to attend graduate school.)
3. Economics 3A, 3B, or Economics 1A, 1B (Note: Students planning to take upper-division economics courses must also take Economics 1C in addition to Economics 3A/3B, or Economics 1A/1B.)

4. Sociology/Social Science Sequence: Sociology 1A, 1B, or URS 24 and one additional quarter of the Third College lower-division social science sequence, or any other two quarters of introduction course to a social science.

Sixteen upper-division courses constitute the major and are distributed as follows:

- 7 URS courses consisting of URS 101, 111A, 121, 131, 186A/B, and 190.
6 Courses in the same discipline and approved by the student's adviser. These courses must represent a clearly defined body of knowledge. These six courses (in the same discipline) constitute a minor and must complement a concentration area. The concentration areas are described below.
3 Upper-division courses from a combination of humanities and ethnic-related studies and approved by the student's adviser.

The four core courses taken during the junior year provide the basic framework for both the major and the minor. These courses, in their sequence are:

Fall Quarter:	URS 101: Introduction to Research Methods URS 111A: Social Policy and Social Planning
Winter Quarter:	URS 121: Metropolitan Development and Analysis
Spring Quarter:	URS 131: Community Dynamics and Ethnicity (this course is a prerequisite for all field studies).

The courses have a general systems theory approach to problem solving. Through these courses, the student develops competence in the theory and concepts. In addition, tools and skills are acquired for examining large-scale, complex social problems. These core courses also provide an understanding of how decisions are made and how policy is formulated in social, political, and economic institutions.

Following completion of these core courses, each student chooses a concentration area in which to explore in greater depth a particular focus within the major of Urban and Rural Studies. These concentration areas are: Planning and Urban Development (PUD), Comparative Urbanization and Development (CUD), Human Resources (which is composed of a health sequence and an applied social science sequence), and Law. These courses serve to integrate three program components: the minor; URS 186A/B, the field work experience; and, the URS 190, senior seminar experience. The student's overall program is facilitated through close collaboration with the faculty adviser.

THE MINOR PROGRAM

The minor in Urban and Rural Studies is composed of the junior year core sequence as described above and two other upper-division courses taken in one of the concentration areas. Students who minor in Urban and Rural Studies are also strongly encouraged to take URS 186A: Field Work in Urban and Rural Studies.

Courses

Lower Division

16. Introduction to Urban Anthropology (4)

Contemporary dilemmas and evolution of urban life. Topics include: family and kinship; race, class, and ethnic relations; poverty and affluence; community and neighborhood; work and leisure organization; modern problems of planning, development, resource use, and change in an urbanizing world. (W)

20. The Concept of Community (4)

A modular examination of urbanization in contemporary life styles with reference to mobility, crowding, density and environmental space, as well as human territoriality. Demographic and social-psychological determinants are used to explore identification, role-performance, social processes, and stress. Staff. (Not offered in 1980-81.)

21. Urban American Society (4)

A sociological introduction to urban America, touching on the following topics: cultural tradition, industrialization, capitalism and the welfare state, careers, work, and leisure, changing family forms, stratification, distribution of wealth, power and prestige; ethnic and racial groups, predicting future trends. Staff. (F) (Satisfies Third College general-education requirement and Sociology 1A prerequisite for upper-division sociology courses.)

22. Urban Economics (4)

Topics to be included: (a) an overview of capitalistic free-market economy ("economics in a nutshell"); (b) economic reasons for the existence of cities; (c) factors influencing the location of people and firms within and between cities (migration); (d) urban problems (pollution, housing, transportation, crime, poverty); (e) urban government (revenues and expenditures, taxes, governmental service.) (Not offered in 1980-81.)

23. Social Structure & Change (4)

Examination of the problem of the maintenance of and change in human societies and other groups: factionalism, acculturation, assimilation, social evolution, urbanization, religious movements, and economic development. Same as Anthropology 23.

24. Society in Action (4)

Social stratification, typologies, and indicators of a social stratification. Social class, conflict, and social change. Fundamental theoretical approaches to the study of the above social phenomena. Within the course the family, education, and economic structures will be discussed in the context of social classes and conflict. Staff. (W) (Satisfies Third College general-education requirement and Sociology 1B prerequisite for upper-division sociology courses.)

25. Law and Society (4)

This course will examine aspects of the legal process, including how and when the process is invoked, judicial decision making, the role of the lawyer. Illustrative cases will be drawn from diverse areas, for example, commitment of the mentally ill, conscientious objection to the draft, economic equalization under the Constitution. (Not offered in 1980-81.)

30. Introduction to Urban Studies (4)

Provides the overview of urbanization as an expression of modern society. Considers contemporary social issues, urban problems, institutional responses, and political dynamics. Requires visitations by students to selected agencies in San Diego. Is designed to give basic concepts and perspectives to Urban and Rural Studies majors. (F)

41. Introduction to Human Care Services (4)

The course provides an overview of human care services with emphasis on social, legislative, and political factors in the

organization and distribution of programs and services under public or voluntary auspices. Impact of professionalism and consumerism. Selected fields: social services, health care and special institutional services. (Not offered in 1980-81.)

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. Same as Psychology 60.

Upper Division

100A-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: URS major, upper-division standing, and consent of instructor.

101. Introduction to Research Methods (4)

Introduction to methods of studying human phenomena in urban and rural settings. Lectures will give critical expositions of the uses of observation, personal official documents, problem identification, hypothesis generation, sampling procedures and research design. Familiarity with statistical techniques unnecessary. Prerequisites: consent of instructor and upper-division standing in social sciences. (F)

102A-B. Research in Policy Formation (4-4)

Use of technical methods in the analysis of urban problems and policy development. Stress of the course is on quantitative techniques used for problem identification and solution. Analytical tools in the course are grouped by subject matter as a means of operationalizing research as it relates to public policy. Prerequisites: URS major and upper-division standing and an introductory course in statistics or consent of instructor. (W,S)

104. Introduction to Social Psychology (4)

An intensive introduction and survey of current knowledge in social psychology. Prerequisite: Psych 60 or Math 80A or URS 20, or consent of instructor and department stamp. Same as Psychology 104.

110. Introduction to Planning and Urban Development (4)

Introduction to theories and definition of urbanism and planning. Relationships between urban development, planning and questions of resource distribution are examined in their social, ethnic, spatial, and political contexts. Among the planning theories examined are: comprehensive, centralized, indicative, incremental, and spatial. Prerequisites: two quarters of a social science and sophomore standing or consent of instructor. (F)

111A-B. Social Policy and Social Planning (4-4)

Introduces concepts, origins, functions, processes, organization and evaluation of social policy and social planning as one form of state response to social costs of economic development. 111B explores comparative social policy and planning and their social consequences as background for considering alternative strategies for more effective mobilization of resources to achieve desired futures. Prerequisite: upper-division standing or consent of instructor. (W,S)

112. Planning Theory (4)

Historical development of the rationales for planned action and a focus on current theories concerning the linking of scientific knowledge to organized social actions. The course provides a basis for determining the limits of planned guidance procedures, including the determination of the elements involved in the decision making process. Prerequisite: URS major or upper-division standing or consent of instructor. (F)

115A-B. Policy and Planning in Higher Education (4-4)

URS 115A outlines origins and functions of higher education, relationship between labor force needs and educational resources, critically evaluates changing educational research and service missions of higher education, reviews factors, strategies, and outcomes of student protest and institutional response. (W)

URS 115B continues above themes with comparative analysis of higher education in selected countries, focusing thereafter on student task groups seeking to understand, cope with, and influence the direction of various university functions to better meet student/worker/community needs. (S)

Urban and Rural Studies

116A. Urban Anthropology (4)

The evolution, form, systemics, and culture of the city as artifact and environment for its component individual groups and communities, explored in terms of the methods and perspectives of anthropology. *Prerequisite:* AN 22 or one upper-division course in anthropology. 116A is a prerequisite for 116B. 116A not open for credit to students who have taken AN 116. Same as Anthropology 116A.

116B. Urban Anthropology Research Seminar (4)

This course will broach the application of social science theory and methods to the planning and realization of the growth, form, and quality of urban life in the San Diego area. The seminar will involve research, field trips, and discussions with diverse participants in the urban growth process. *Prerequisites:* AN 116A and consent of instructor. Same as Anthropology 116B.

117. 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. *Prerequisite:* upper-division standing or consent of instructor. (Not offered in 1980-81.)

119. Deficit Modeling and Social Policy (4)

Labeling and its effects on allocation of resources, decision-making, and implications for improving human welfare are examined. Emphasis is given to expressions of social policy where blaming the victims or deficit modeling characterize social objectives for ethnics of color. *Prerequisites:* URS 131 and/or URS 111. (Not offered in 1980-81.)

120. Urban Social Problems (4)

Concerns the facts and theories of contemporary social problems in urban America. The emphasis will be on social problems, not on urbanism. Same as Sociology 120.

121. Metropolitan Development and Analysis (4)

Analysis of the economic, social, and administrative factors of metropolitan development with respect to the relationships of the community to its region (function) and to its internal organization (structure). Particular emphasis on the linkages of the metropolitan subsystems and their roles in the development process. *Prerequisites:* upper-division standing in the social sciences and consent of instructor. (W)

122. Social Impact of Urbanization (4)

Focus on distribution of social costs and benefits of urbanization-industrialization process. Through comparative analysis, will identify forces generating various forms of urbanization, and evaluate human consequences of that process. *Prerequisite:* upper division standing or consent of instructor. (Not offered in 1980-81.)

123. The Housing Environment (4)

An introductory course examining the forces controlling housing. Emphasis will be placed upon the definition of the market, social factors, and economic policy. Written case studies will be examined dealing with the development process, and lectures will be supplemented by attendance at relevant public meetings held in the San Diego area. (Not offered in 1980-81.)

130. Sociology of Development (4)

A sociological perspective on problems of development and modernization in formerly nonindustrial societies. An analysis of interactions between the old and the new social structures and processes and the social implications of various selected strategies in social planning for emergent institutions. *Prerequisites:* Sociol 1A, 1B, 2, or consent of instructor. Same as Sociology 130. (May not be offered in 1980-81.)

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:* URS major or upper division standing or consent of instructor. (S)

131L. Community Dynamics and Ethnicity Lab (4)

Models for human service delivery, community development, action, and planning will be taught through exercises and individual projects. *Prerequisites:* URS 110, 111A, and 131 (concurrently)

134. Community Resource Development and Organization (4)

Course covers the organization of community resources and political, social, economic and motivational factors related to

their establishment and maintenance. Will study organizations and services in urban areas of San Diego and make comparative studies of these organizations in rural areas. Field trips and student projects supplement class discussion. *Prerequisite:* URS senior majors or consent of instructor. (Not offered in 1980-81.)

137. Community Development and Organization (4)

Analyzes effects of conflicts of institutions, social mobility, individuation, anomie, and ethnocentrism on community dynamics. Examines positive interactions between delivery systems and ethnocentrism. Linkages or frames of reference built upon aspects of systems theory applicable to the social sciences. *Prerequisites:* upper-division standing in social sciences and consent of instructor. (Not offered in 1980-81.)

140. 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. *Prerequisites:* Sociol 1A, 1B, 2, or consent of instructor. Same as Sociology 14. (May not be offered in 1980-81.)

143. Introduction to Community Health (4)

Defines health determinants of a community; measurement of health and illness; current major health problems, causes, and prevention. Course will include basic principles of epidemiology, control of infectious diseases, and control of noninfectious hazards of the physical, chemical, biological, and/or social environment. *Prerequisites:* upper-division standing and consent of instructor. (Not offered in 1980-81.)

144A. Orientation to Health Care Organization (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. Concerned with the structure, objectives, and trends of major health and health-related programs in the U.S. to include sponsorship, financing, training, and utilization of health personnel. *Prerequisite:* upper-division standing and consent of instructor. (F)

144B. Preventive Health Care (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. *Prerequisites:* upper-division standing and consent of instructor. URS 144A

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. *Prerequisite:* junior standing required.

146. Case Studies in Health Care Programs (4)

The purpose of this course is to select identified populations with special needs and review their status of care, factors influencing incidence of disease and health problems, political and legislative measures related to the provision of care. This group would include population at risk (health-wise) — the poor (rural and urban), mothers and children, elderly. *Prerequisites:* URS 145, upper division standing, and consent of instructor. (W)

147. Influences on Health Systems (4)

This course will focus on health resources in the United States in terms of health facilities, manpower, and financing, and the relationship of these resources to quality. The course will also include a brief analysis of proposals for national health insurance and an overview of health systems in other countries. *Prerequisite:* upper division standing or consent of instructor. (S)

148. Nutrition — U.S.A. (4)

The purpose of this course is to emphasize the importance of nutrition to health. The course will give the student an understanding of the science of nutrition, and the kinds of health problems associated with poor nutrition. It will help students

interpret the principles of nutrition in selecting an adequate diet, and will teach them where to look for reliable sources of nutrition information, and how to evaluate claims made through product advertising. *Prerequisite:* upper-division standing or consent of instructor. (Not offered in 1980-81.)

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 referenced themes. *Prerequisite:* consent of instructor. (Not offered in 1980-81.)

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. (Not offered in 1980-81.)

152A. Personal and Social Development (4)

A lecture-discussion course on the human life span from birth to young adulthood. Content areas include personal-social states and adaptive processes for infancy and early childhood, childhood, adolescence and young adulthood. *Prerequisites:* Psych. 10A-B-C or consent of instructor. (F)

152B. Personal and Social Development (4)

A continuation of 152A with emphasis on the human development period from the upper limits of young adulthood to old age. Topics included are effective social behaviors and change of life in males and females; social roles and effective behavior; personal-social opportunities for enhancement of self-esteem, attitudes toward dying; and, social disengagement and aging. *Prerequisite:* URS 152A or consent of instructor. (W)

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:* URS 152B; upper-division standing and/or consent of instructor. (S) (Not offered in 1980-81.)

155. Group Processes (4)

An introduction to the social psychological study of human behavior in small groups. Special emphasis will be given to interpersonal relations, structure, leadership and cohesiveness. The course will combine lecture, discussion and small group experience methods. *Prerequisites:* Psych. 104 or consent of instructor and department stamp. Same as Psychology 155. (May not be offered in 1980-81.)

156. Ethnic Attitudes (4)

This course examines beliefs and values of ethnic groups in the United States with emphasis on behavioral and social consequences. The origin and development of racial attitudes will be studied, with an emphasis on the attitudes of African and European Americans. *Prerequisites:* URS 20 or URS 21 or URS 111, or consent of instructor and department stamp. Same as Psychology 156. (May not be offered in 1980-81.)

159. The Urban Underclass (4)

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. *Prerequisite:* upper-division standing or consent of instructor. (Not offered in 1980-81.)

168. Socio-Economic Change in Developing Areas (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. *Prerequisite:* upper division standing or consent of instructor. Same as Sociology 168.

170. Comparative Rural Societies (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 im-

pect of change, modernization, and the world economy on contemporary rural societies, especially Third World underdeveloped ones. *Prerequisite: upper-division standing or consent of instructor.* Same as Sociology 170.

171. Introduction to Law and the Judicial Process (4)

This course deals with forces influencing the making of the law, especially as it is made in the process of adjudication, and with the nature of the judicial process itself. It draws upon the work of lawyers, political scientists, historians, sociologists and moral philosophers. *Prerequisite: upper-division standing* (Not offered in 1980-81.)

173. Contemporary Legal Issues (4)

Analysis and discussion of current legal problems and their impact on society. Topics to be covered will include drug laws, the environment, obscenity and free speech, search and seizure, and their constitutional implications. *Prerequisites: URS 171 and consent of instructor.* (Not offered in 1980-81.)

186A-B. Field Work in Urban and Rural Studies (4-16)

In an attempt to define and study some unique process of community life, students will develop and implement projects requiring their participatory involvement in some community. Projects may cover such areas as health (medical and psycho-social), education, housing and welfare. *Prerequisites: junior standing, URS major, and consent of faculty fieldwork supervisor.* Required course for urban and rural studies majors. May be repeated for credit. (F,W,S)

190. Senior Seminar (4)

Fundamentals of professional and scientific behavior through oral and written reports of students' field experiences. Principles and practices of research design. Ethical issues and professional conduct. Staff. (S)

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.* May be repeated for credit.

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: 214 Mandeville Center for the Arts

Professors:

David Antin, M.A., (*Chairman*)
Eleanor Antin, B.A.
Harold Cohen, Diploma of Fine Arts
Manny Farber
Newton Harrison, M.F.A.
Madlyn M. Kahr, Ph.D.
Allan Kaprow, M.A.
Italo Scanga, M.A.

Associate Professors:

Standish Lawder, Ph.D.
Sheldon Nodelman, Ph.D.
Moiria Roth, Ph.D.

Lecturer with Security of Employment:

Jehanne Teilhet, Ph.D.

Assistant Professors:

Darrell Davisson, Ph.D.
Fred Lonidier, M.F.A.
Patricia Patterson
Philip Steinmetz

Lecturers:

Claudio Fenner-Lopez, M.A.
Jean-Pierre Gorin, Licence de Philosophie

* * *

The Visual Arts Department offers courses in painting, sculpture, performance, film, video, photography, and art history/criticism (including that of film and video). A bachelor's degree from this department provides 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 the student with 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 with 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 explanatory 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 studio space for graduate students and faculty offices. In addition, many of the faculty have studios near Warren campus and undergraduate studio 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, super 8 and 16mm film, performance, sculpture, and video. Facilities at the

Media Center include black/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 85,000 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 Revelle fine-arts requirement, and the Revelle minor. Third College students may satisfy the humanities and arts requirement under program B of the general education requirement.

Residency Requirements

A minimum of 50 percent of the course work completed for the major must be taken as a registered student at UC San Diego.

Visual Arts 10, Theory of Art, and Visual Arts 14, Nineteenth and Twentieth Century Art, are required courses for transfer students.

NOTE: Rarely are transfer credits accepted toward fulfilling Group III requirements under the studio major. Transfer credits for the communications/visual arts major are subject to approval by both the Communications Program and the Department of Visual Arts.

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,

Visual Arts

painting, sculpture, performance, photography, video, 8mm and 16mm film, as well as many offerings in art history/criticism. There are neither facilities nor courses for the pursuit of crafts or graphics.

NOTE: All major course work must be taken for a letter grade.

Group I: Lower Division

(Foundation Level)

Seven Courses required:

- *1 Introduction to Art-Making
- *2 Introduction to Art-Making
- *3 Introduction to Art-Making
- */**10 Theory of Art
- */**14 Nineteenth- and Twentieth-Century Art
- *Choice of any two:
 - 13A Intro to Arts of Nonliteral Cultures
 - 11 Prehistoric and Ancient Art
 - 12 Medieval Art
 - 16 Renaissance and Romantic Art
 - 84 History of Film

*Required for all studio majors

**Required for all transfer majors

NOTE: VA 111, Structure of Art, should be taken in lieu of VA 10, Theory of Art.

Group II: Upper Division

(Beginning Level)

Four courses required (Note: Visual Arts 1, 2, 3 and either 10 or 14 must be completed before taking Group II courses) Choose four from:

- 160 Photography
- 170 Introduction to Media
- 105A Drawing
- 106A Painting
- 107A Sculpture
- 104A Performance

NOTE: Students planning a program involving film and/or video must take VA 170, Intro to Media.

Group III: Upper-Division Studio

(Intermediate and Advanced Level)

Five courses required. Upper-division studio courses such as Intermediate Drawing or Representational Painting satisfy these requirements. Check with department for full course listings.

Group IV: Upper-Division Non-Studio

Four courses required. Upper-division art history/criticism courses such as Hard Look at the Movies, Renaissance Art, or Seminar in Contemporary Art satisfy these requirements. Check with department for full course listings.

Art History/Criticism Major

This major is intended to provide students with a comprehensive and integrated foundation in the history, theory, and criticism of the visual arts. The application of the techniques of historical and critical analysis to a range of the major periods, genres, and media of artistic expression — including twentieth-century technological media — is stressed. Departing from a unified base, the major permits eventual emphasis upon either art history or art theory/criticism. Students considering the possibility of graduate work are advised to achieve proficiency in one or more of the principal foreign languages needed for scholarly research in addition to the requirements set forth below.

NOTE: Requirements for this major are under review; please contact the Department of Visual Arts for current information.

Lower Division

Eight Courses required:

*Two studio courses chosen from:

- 1 Introduction to Art-Making
- 2 Introduction to Art-Making
- 3 Introduction to Art-Making
- 160 Photography

- */**10 Theory of Art
- *11 Prehistoric and Ancient Art
- *12 Medieval Art
- *16 Renaissance and Romantic Art
- */**14 Nineteenth- and Twentieth-Century Art
- *13A Intro. to Arts of Nonliterate Cultures

(Students focusing in theory/criticism are required to take Visual Arts 84, History of Film, in place of one of the following courses: Visual Arts 11, 12, 13A, or 16.)

NOTE: VA 111, Structure of Art, should be taken in lieu of VA 10, Theory of Art.

Upper Division

Twelve courses required. At the upper-division level, students decide whether to focus on art history or art theory/criticism. Two upper-division courses are required for all majors:

- */**102A History of Criticism
- */**103 Art Historical Methods

Of the remaining ten upper-division courses, the student will take six in the area of specialization and four in the other area. Specific course listings for art history and theory/criticism are available from the department.

*Required for all history/criticism majors.

**Required for all transfer majors.

Communications/Visual Arts Major

Requirements for this major are under review; please contact the Department of Visual Arts for current information.

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 UC San Diego program is unusual in that, while encouraging the full development of the student's particular interests, it seeks to provide an integrated and comprehensive introduction to the possibilities available in the most diverse and challenging form of contemporary artistic production, to the intellectual strategies which underlie them and to the implication of these strategies and the choices which they entail. The word "art" is used here to denote a broad range of activities, and we do not differentiate between students in terms of traditional technique and media-based classifications. All art-making activities are considered as serious intellectual endeavor, and all students in the program find themselves confronted by the need to develop their intellectual and critical abilities and their verbal skills in the working out of their artistic positions. There are no craft-oriented programs, nor facilities for doing any; nor do we have any courses in art education or art therapy. The courses are intended to develop in the student a coherent and informed understanding of the past and of recent developments in art and art theory. Again, the department aims to establish a confident grasp of contemporary technological possibilities, including those involved in film, photography, and the electronic media. For reasons of efficiency, much of the teaching and learning is done in structured courses — lectures, seminars, study groups. Attendance to these requirements is not intended to replace the student's individual work, nor to underestimate the central importance of that work and its development. That aspect of the student's activity is expected to be continuously self-motivated, and to form the dynamic background against which the program of study operates and makes sense, just as faculty do their teaching against a background of continuous professional activity. No two students will necessarily follow the same

path through the degree program, and the constitution of individual programs of courses will depend upon the analysis of individual needs and interests, worked out by the student in collaboration with his or her faculty adviser. A certain number of theory-oriented courses are required.

Admission Requirements

Grade-Point Average — An overall GPA of 3.00 and a 3.50 in a student's major is required.

Personal Interview — Interviews may be requested 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, photography, etc. These will be returned upon review of the application. Please 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, 1981. Work and statement 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 visual arts faculty 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 1500 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 recent 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 40-50 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 intermediate 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.

4. Introduction to Art-Making (4)

This course will emphasize image-making as providing the most essential characteristics of art-making, whatever its form or style. Lectures will be designed to introduce students to a number of underlying concepts: the cognitive basis of image-making behaviour, the notion of representation as information-processing, the functional non-interchangeability of representation modes, and the nature of skill. Studio session will present a series of problems and situations designed to give a practical, inside understanding of the significance of these conceptual issues.

10. Theory of Art (4)

Introduction to the significant structure of art works. If an art work "means something" it is possible to ask "how" it means it and "what" it means. These questions will be asked in relation to examples of representational and nonrepresentational art works from a great variety of periods and cultures. The course will deal with photography, architecture and performance as well as painting, sculpture, and drawing. (Not offered in 1980-81.) Note: VA 111, Structure of Art, should be taken in lieu of VA 10.

11. Prehistoric and Ancient Art (4)

The origins of our figurative tradition in the art of the European paleolithic, the construction of monumental form in the Bronze Age in the Near East, and the classical achievements of Greece and Rome.

12. Medieval Art (4)

The nature and function of art in the service of a new spiritual order in the last phase of antiquity, its efflorescence in Byzantium, and the interaction of the antique heritage with Northern traditions in the Romanesque and Gothic to form a new, distinctively European art.

13A. Arts of Nonliteral Cultures (4)

This course serves as an introduction to the arts of nonliteral cultures and will consider aspects of Asian art, early Egyptian art, tribal, and folk arts as well as other primarily oral cultures. The emphasis will be placed on the artist, the aesthetic process and the end product and the relationship of the art to the culture as a whole.

14. Nineteenth- and Twentieth-Century Art (4)

A survey of nineteenth- and twentieth-century art (with emphasis on painting) which will be presented on both a chronological and theoretic level. Course begins with art of the French Revolution and ends with art of the 1970s.

16. Renaissance to Romantic Art (4)

A global view of the figurative arts from the fifteenth through the mid-nineteenth centuries will be covered in this course. Emphasis will be placed on the interactive forces of the visual arts and concurrent political, religious, and technological developments from the Renaissance through the Baroque and Rococo periods through to mid-nineteenth-century Romanticism.

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 film-makers including those of Europe, Russia, and the United States. Materials fee required.

Upper Division

102A. History of Criticism (4)

Significant critical works will be read and discussed. Examples will be drawn from the philosophical, theoretical literature from Plato through Kant, as well as from the craft and conservative traditions exemplified by writings like Dandini, Arétino, Reynolds and Diderot. Required for all art history/criticism majors. *Prerequisite: one upper-division art history or criticism course required, two recommended.*

102B. History of Criticism (4)

A continuation of Visual Arts 102A which will deal with work from Kant to Heidegger, with readings in the criticisms of the professional art critics from Baudelaire through Clement Greenberg, Harold Rosenberg, and Michael Fried. *Prerequisite: 102A or consent of instructor.*

103. 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 alternate possibilities. Open to art history/criticism majors and visual arts graduate students only. Should be taken in the senior year. Required for art history/criticism majors. May be repeated once for credit. *Prerequisite: one upper-division art history course required, two recommended.*

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 10 or 14.*

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, ritualism and transcendental performance are among the topics that may be covered. *Prerequisite: VA 104A or consent of instructor.*

104E. Non-Audience-Oriented Performance (4)

This course deals with that branch of current performance art which is not based on theatrical elements, but upon participation. 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-B-C. Drawing (4-4-4)

A. 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, conte. *Prerequisite: VA 1, 2, 3 and 10 or 14.*

B. A continuation of 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.*

C. For advanced students. Students will be given the opportunity to explore the relation between their own energy and idiosyncrasy as draftsmen/artists, and the quasi-objective demands of representing various types of real and virtual space. May be repeated once for credit. *Prerequisites: VA 105A and one additional upper-division drawing course or consent of instructor.*

105D. Life Drawing (4)

Using both nude and clothed models the course explores the body as 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.*

106A-B-C. Painting (4-4-4)

A. 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 10 or 14.*

B. 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.*

C. 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.*

107A,B,C,D,E,F,G,H,I,J. Sculpture (4 units each)

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 10 or 14.*

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 narration. May be repeated once for credit. *Prerequisite: VA 107A or consent of the instructor.*

E. **Transaction with the City (4)**
Sculpture and the Man-Made Environment
Transaction with the City will introduce students to some of the sculptural possibilities in the urban environment. Students will examine interior and exterior public spaces both formal and informal in the San Diego environs. Students will be asked to make proposals, plans, and models for specific sites of their own selection. Urban systems, space, time, movement, content, and potential audience in relation to the site will be discussed. An examination of works done over the last several decades will inform group discussion and criticism. Simple materials such as photography, collage, cardboard, found objects, etc., will be used. May be repeated once for credit. *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 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, photography, 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 to 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 or existing hypothetical architectural space and graphic aids such as drawing, photography, and collage may be utilized. May be repeated once for credit. *Prerequisite: VA 107A or VA 106A 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, assembling and ordering. May be repeated once for credit. *Prerequisite: VA 107A or consent of the 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. May be repeated for credit once. *Prerequisite: consent of instructor.*

NOTE: Specific orientation of this course will vary with the instructor. Topics may include film, video, photography, painting, performance, etc.

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. Note: VA 111, Structure of Art, should be taken in lieu of VA 10, Theory of Art.

112. Medieval Art (4)
This course will cover the architecture, sculpture, and the other art forms in Western Europe from the eleventh through the fourteenth centuries. Special emphasis will be placed on the function from ecclesiastical to secular, early modern culture. *Prerequisite: none. VA 12 recommended.*

113A. Non-Western Art History (4)
This course will explore the arts of non-Western cultures: Northwest Coast, Africa, Oceania, and Nepal. Emphasis will be placed on the art as a medium of communication; the artist and the aesthetic process in relationship to culture will be analyzed. *Prerequisite: none, although some background in the history of art helpful.*

113B. African and Afro-American Art (4)
This course is a critical aesthetic survey of West African arts in their cultural setting and the subsequent art styles which survived the transplant in the slave areas of the Americas. Emphasis will be placed on those West African tribes who were captured into slavery.

113C. Polynesian Art (4)
This course serves as a critical analysis of what the arts of Polynesia can tell us about the Polynesian culture at the time of contact with Western culture. This course will cover Tonga, Samoa, Society Islands, Marquesas, New Zealand, Hawaii, and Easter Island.

113D. Melanesian Art (4)
This course will analyze the role of the arts, artists, and the aesthetic process in the living cultures of Melanesia: Solomon Islands, New Guinea, New Britain, New Zealand, New Hebrides, and Australia.

113E. Sociology of Primitive Art (4)

This is an advanced course which will analyze theories on what the arts can tell us about a culture, e.g., why do people in preliterate cultures, who live in rectangular houses, tend to emphasize rounded forms in their art.

113F. Primitivism of Modern Art (4)

This course will be concerned with the different ways modern artists (Gauguin to Moore) were influenced by primitive art. May be repeated once for credit.

113G. Afro-American Art (4)

This course will examine the subsequent West African art styles that survived the transplant in the slave areas of the Americas, Haiti, and Cuba. The process of acculturation, in regards to the visual arts, folk tales, and customs will also be emphasized.

113H. Western and Non-Western Rituals and Ceremonies (4)

This course will examine the image-making process and contextual use within specific ceremonies and/or rituals. Content will focus on Christian and non-Christian imagery with emphasis on the cultures of West Africa, Melanesia, Nepal, and the American Indians.

113J. Women Artists in Nonliteral Cultures (4)

This course will explore the issues surrounding the role of women as artists in a number of nonliteral cultures including Nepal, Oceania, Africa, and the Americas.

113K. The Interface of Western and Non-Western Art (4)

This course will address the impact of Western technology (film, photography, etc.) and its aesthetics on non-Western artists. Conversely, the course will also examine the influence of non-Western art on modern and contemporary art.

113L. The Role of Women in the Arts (4)

This course will analyze the equivocal role of non-Western women artists as well as the emerging role of Western women artists. The course will also examine, within a cultural context, how often women are depicted in the arts; what types of female images predominate (i.e., mother/child, splayed female, etc.); and who are the patrons and/or consumers of these images. *Prerequisite: one upper-division Western art history course; two recommended.*

114A. Futurespace: Architectural Definitions of Human Habitats (4)

A culturalogical analysis of architectural environments, leading to a hypothesis for future habitats. Strong emphasis will be placed on historical traditions for a wide variety of cultures, primitive through modern. A study of architectural theories and their consequences as applied to building designs and city planning throughout history. *Prerequisite: none; although some experience with the history of art will be helpful.*

114B. The Italian City-State in the Fourteenth Century (4)

An historical and theoretical approach to the interaction and interdependence of the emergent city-states with their surrounding territories as they searched for a definition of the New Order in art and architecture. *Prerequisite: None; although some experience with surveys of the history of art will be helpful.*

114C. Italian Renaissance Art and Modern Science (4)

A review of the origins of early modern science in the art of the Italian Renaissance from the late fourteenth century through the sixteenth. Space measuring, flying and diving craft, nature studies, mechanical devices, geography, anatomical studies, as they appear in the work of Leonardo da Vinci and his predecessors. *Prerequisite: none; VA 16 recommended.*

115B. Art and Ideas of the Early Italian Renaissance (4)

An examination of the generative forces in early fifteenth century Italian city-states that analyzes the ideological transition from medieval to modern. *Prerequisites: none; although some experience with surveys of the history of art will be helpful.*

115C. Baroque Art (4)

The architecture, sculpture, and painting of the seventeenth century, principally in Rome and its trans-Alp expansion. *Prerequisite: VA 16 or consent of instructor.*

115H. Prehistory of Western Art (4)

The art of Europe and the Mediterranean in the Paleolithic period in its relationship to human consciousness with consideration of its historical consequences for the later art of the West. *Prerequisite: VA 11 or consent of instructor.*

115J. Late Antique Art (4)

This course will deal with architecture, sculpture, and painting across the transition from antique to medieval style from the second to the sixth century, A.D. *Prerequisite: VA 11 or consent of instructor.*

115K. Narrative Structure in the Visual Arts (4)

An investigation of the strategies of representation of events in time with the visual arts, and their significance for the meaning and effect of the work. Typical cases from a range of art historical periods and situations will be scrutinized; ancient art will be emphasized. *Prerequisite: either VA 11, 12, 14, or 16 or the consent of instructor.*

115M. Greek Art (4)

This course will cover the major arts of Greek architecture, sculpture, and painting during the Archaic, Classic, and Hellenistic periods.

115N. American Art 1900-1950 (4)

The course will examine the work and attitudes of such movements as the Alfred Stieglitz group, Precisionism, Regionalism through to Abstract Expressionism. Individual artists and movements will be studied in the context of their cultural and political-economic milieu. *Prerequisite: VA 14 or consent of instructor.*

115P. Early Christian and Byzantine Art (4)

The emergence of Christian art and iconography from paleo-Christian times through the "Peace of the Church." All areas where Christian art emerged in the Roman Empire and the earliest formal monuments from about 200 A.D. to approximately 450 A.D. will be covered. Sources of Christian iconography in Eastern mysticism and the interdependencies of the Roman state, local traditions with the new faith will be examined in terms of their social implications. *Prerequisite: VA 11 or VA 12 or consent of instructor.*

115Q. Northern Renaissance Art (4)

Major artistic developments in the Netherlands, Burgundy, France, and Germany will be traced through the period from 1380 through 1519, with special emphasis on the social and intellectual changes manifest in the art of this period. *Prerequisite: VA 16 or consent of instructor.*

115R. Gothic Art in Northern Europe (1130-1400) (4)

This course is a culturalogical view of art in the late Middle Ages with special emphasis on the role of the church and monarchy in the emergence of a new formal, artistic language. Specific topics will vary. May be repeated twice for credit. *Prerequisite: VA 12 recommended.*

115S. Early Medieval Art, 500-1000 (4)

A review of the art of the West after the collapse of the Roman Empire, through the period of the invasions, Hiberno-Saxon art, the Carolingian revival, and the Ottonian period in Germany to the end of the millennium. *Prerequisite: VA 12 recommended.*

115T. Spanish Painting and Its Effect on Nineteenth-Century French Art (4)

This course will focus on the Spanish artists El Greco, Ribera, Zurbaran, Velazquez, Murillo, and Goya and the impact of their work on the development of nineteenth-century painting, particularly in France. *Prerequisite: VA 16 recommended.*

115U. 19th Century Symbolist Thought (4)

An exploration of Symbolist painting through the conceptual framework of poetic theory. Correspondence, suggestion, synthesis, repetition, ambiguity, derangement of the senses, primitivism, and other significant concepts of Symbolist ideology will be explored through their manifestations in art. *Prerequisite: none; VA 14 recommended.*

115V. Roman Art (4)

The major arts of architecture, sculpture, and painting during Rome's imperial centuries (ca. 200 B.C. 400 A.D.) will be scrutinized against the background of their Greek and Etrusco-Italic inheritance and within their contemporary social, political, and intellectual context, with a view to an understanding of the central role of the art of Rome as the foundation of Medieval and later Western art.

115W. Barbarian Art in Europe (450-1000) (4)

Arts and archaeological discoveries of the barbarian invasions of Europe from the collapse of the Roman Empire to the final conquest of pagan, Nordic tribes will be covered in this course. Jewelry, armor, sculpture, architecture, and manuscript illumination of the "Dark Ages" will be examined in terms of the interactive relationships between Christianized Rome and migratory pagan cultures. *Prerequisite: none; although some background in art history will be helpful.*

116. Egyptian Art (4)

A survey of the painting, sculpture, and architecture of Egypt, beginning with the prehistoric period through the XX dynasty of the New Kingdom. The course will view these art forms within their historical, social, and religious contexts. *Prerequisite: VA 11 or consent of instructor.*

117. Eighteenth-Century Art History (4)

A general survey of the painting, sculpture, and architecture of the eighteenth century in Europe and America. *Prerequisite: VA 16 or consent of instructor.*

118. Nineteenth-Century Art History (4)

A survey of nineteenth-century art in Europe and America, stressing stylistic developments from Neoclassicism to Post-Impressionism. *Prerequisite: VA 14 or consent of instructor.*

119. Topics in Twentieth-Century Art (4)

This lecture course will consist of a selection of topics (to be changed each time the course is taught) in twentieth-century European art. Topics will range from 1900 through 1950 and will cover such movements as Cubism, Fauvism, Northern Expressionism, and Visionary Abstraction, Russian Revolutionary Art, De Stijl, Dada, and Surrealism. May be repeated twice for credit. *Prerequisite: VA 14 recommended.*

120. Aspects of Contemporary Art (4)

This lecture course will consist of a selection of topics in contemporary art from the 1950s through Pop Art, minimalism and conceptual art to the genres of the 1970s. *Prerequisite: VA 14 or consent of instructor.*

121. A Critical History of Photography (4)

A critical examination of photographs and photographers. Attention will be focused on the ideas and arguments of major movements and important individual artists. The importance of historical ideas in their relation to contemporary photographic issues will be stressed, as well as the problems of the medium as an art form. *Prerequisite: VA 14.*

123. Photographic Theory (4)

This course serves as an introduction to, and history of, the major theories underlying photography. It covers the interaction between photography (and film and video) and other art forms such as painting, drama, and literature. While traditional forms of criticism will be analyzed, emphasis will be upon semiotic, sociological, and communication information models of inquiry. Overlaps of theory in film and video will also be discussed.

124. Art Criticism (4)

The 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.*

125. Critical View of Contemporary Photography (4)

This course is designed for a wide audience and is open to nonmajors as well as majors. A critical survey of contemporary photography, situated against the cultural crisis of the 1960s and 1970s, the course will concentrate on both "fine art" and mass cultural uses of the photographic image. Examining both the museum/gallery system and the so-called "independent" photographic artists as well as the making of advertising messages, pornography, and new forms of family snapshots, photography's final climb to fine arts status will be examined for its latent cultural meanings. Much attention will be paid to Robert Frank, Diane Arbus, George Eastman House as particularly problematic individuals and institutions. The seepage of photography into all compartments of "advanced" art will also be discussed with attention paid to the role of art world photojournalism, artists' documentation, and so on. The course will provide a close but contextual reading of ongoing photographic work by photographers.

126. Matisse and Picasso (4)

A study of two major painters of the early twentieth century: Matisse, the "conservative" modern and Picasso, the "radical" modern. Particular emphasis will be placed on their respective innovations in the context of their colleagues at the time. *Prerequisite: VA 14 or consent of instructor.*

Visual Arts

128. Ancient and Tribal Performance: Rituals, Carnivals, and Games (4)

This course is an investigation on a worldwide basis of some of the major performance arts that have provided an insight into the origins of art, the intersection of art, music, poetry, dance, and drama in traditional performance and the relation of traditional to contemporary performance modes. Readings and films will cover events like the Navajo night chant, the Australian Aborigine "Kunapipi," the Brazilian carnival, the Batinese shadow play, the Capitol Pueblo Indian sacred clown dramas, the classical and modern European olympics, sacred ball-games, string games, gambling games, etc. Literature, drama, music, anthropology students are welcome.

129. Advanced Topics in Art History (4)

This course will cover a number of topics in art history. The content covered each time will vary with the instructor. May be repeated once for credit. *Prerequisite:* Two upper-division art history courses or consent of instructor.

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. Semiotics (4)

This course is an examination of modes of signification in the arts and the possible structure of these modes. Recourse will be made to linguistic, communicational, and game models. Writings of the Prague School, the French tradition, and some of the English and American language philosophers will be considered, and an attempt will be made to develop particular models more suited to the arts than those previously worked out. *Prerequisite:* consent of instructor.

132. Venetian Painting (4)

Drawing on their rich Byzantine tradition and responding to their luminous and colorful environment, Venetian painters in the sixteenth century produced art of unprecedented sensuousness.

145A-B. Representational Painting (4-4)

A — 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 for credit once. *Prerequisite:* VA 106A or consent of instructor.

B — A continuation of Visual Arts 145A on the intermediate level. May be repeated for credit once. *Prerequisite:* VA 145A.

147. Animal Drawing (4)

Studio course which develops visual knowledge of and skill in capturing the form, movement, and texture of birds, animals, and fish. Special emphasis will be placed on understanding the environment of the animals and their behavior in that environment. The class will meet alternately on campus, at the zoo, the Museum of Natural History, Scripps Aquarium, and local farms. Students will be expected to carry out given assignments as well as initiate their own projects. May be repeated once for credit. *Prerequisite:* VA 105A.

148. 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.

160. 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 lecture, field, and lab experience. Basic discussion of image making included. *Prerequisites:* VA 1, 2, 3, and either 10 or 14 or consent of instructor. Materials fee required.

166A-B. Camera Techniques (4-4)

A — An intermediate course involving refined control over different films, developers, papers, and other photographic techniques. Materials fee required. *Prerequisite:* VA 160.

167A-B. Photographic Strategies (4-4)

A — An introduction to the aesthetic problems in photography. Materials fee required. *Prerequisite:* VA 160.

B — An advanced study of the aesthetic problems of photographic image to cultural phenomena. Students will work on individual projects each quarter and will be evaluated according to their own progress made during the quarter. May be repeated twice for credit. Materials fee required. *Prerequisites:* VA 166A and VA 167A.

168. Color Techniques in Photography (4)

Instruction in color photography and printing. Lectures on theory and demonstrations in shooting and printing color negatives. Materials fee required. *Prerequisites:* VA 160, 166A, and 167A.

170. Introduction to Media (4)

An introductory course dealing with the theory of communication through portable video recording equipment and super 8 film. The theory of the relationship of camera to eye to viewer is explored. Experimentation is explored through laboratory experiments and projects using both 1/2" video tape, 3/4" video cassettes, and super 8 film. Crosslisted with Comm/Gen. 100C. Offered fall quarter only. Materials fee required.

NOTE: This course is a prerequisite to ALL Department of Visual Arts film and video production courses as well as Communications Program media courses.

172. Video Studio Techniques (4)

The exploration of video as a communications tool, an art form, and an experimental medium. This course will introduce the student to the television studio, its equipment and possibilities. Emphasis will be placed on the application of video techniques in the controlled environment of the television studio. *Prerequisite:* VA 170/Comm/Gen. 100. Crosslisted with Comm/MP 116.

173. Scripting for Film and Video (4)

The course emphasizes the use of scripts for conceptualizing the organizing ideas for film or video prior to actual production. Existing tapes and films will be critiqued. Small groups will produce a three-minute tape or film to increase their understanding of the relationship of scripting to production. As a final project, each student will develop a script from treatment through two drafts and a storyboard. *Prerequisite:* VA 170 or Comm/Gen. 100.

174. Video Sketch Book (4)

This course is intended for young artists interested in pursuing the possibilities of incorporating video within their art-making activities. Students working in any medium (performance, painting, sculpture, conceptual art, etc.) are encouraged to attend. *Prerequisite:* consent of instructor. Students should have working knowledge of video.

175A. Video Production (4)

A studio course in the use of video as an art form. Most aspects of video production will be studied — scripting, shooting, editing, and sound. May be repeated once for credit. *Prerequisite:* consent of instructor.

175B. Advanced Studio Techniques — Video (4)

This course emphasizes producing and directing in "real time" from video scripts developed during or prior to the course. May be repeated once for credit. *Prerequisites:* upper-division or graduate status and consent of instructor.

175C. Advanced Video Workshop (4)

Students will work both individually and collectively in the scripting, research, and production of short videotapes from five to ten minutes in length. The course will examine the interface between video and other arts (rather than using video as a passive recording medium), and this approach will largely determine the generic themes and visual styles of the final projects. A high degree of prior knowledge of video will be required of all students. *Prerequisites:* knowledge of fundamental portapak video and black-white video techniques or consent of instructor, upper-division or graduate status.

176. Video Strategies (Studio Techniques) (4)

This is a production course designed for the student wishing to explore video as a contemporary art form. Its conceptual orientation will explore imaging techniques and devices of video to encode fundamental modes of visual experience which are analogous to the expressive means of other pictorial arts. The student will be introduced to such image manipulation systems as chroma key matting, character generation, video feedback, and the special-effects generator within the controlled environment of the television studio. Final project required. *Prerequisite:* VA 170 or Comm/Gen. 100.

177. Experimental Film, Video, and Photography (4)

This is a production course investigating a wide range of experimental work in film, video, and photography. Extending beyond the generic definitions of documentary and narrative, the course will examine alternative possibilities in the media arts. Students will prepare projects in 8mm film, 16mm film, video, or photography. May be repeated twice for credit. *Prerequisite:* Either VA 185A, 186A, 176, 172/Comm/MP 116, 167A, or consent of instructor.

178. Video Criticism (4)

An examination of video as an art form with particular emphasis on recent work 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. Materials fee required. *Prerequisite:* consent of instructor.

179. Narrative Film, Video, and Photography (4)

This is a production course investigating the concept of narration in media. Studying images and editing from film, video, and photography, the course will examine a number of points including the nature of "fiction," the function of a storyline, and the interaction of characters in a narrative. Students will be required to present a final project in 8mm film, 16mm film, video, or photography. *Prerequisite:* VA 185A, 186A, 172/Comm/MP 116 or 176, 167A, or consent of instructor.

180. Documentary Film, Video, and Photography (4)

This is a production course investigating the concept of documentation in media. Studying images and editing from film, video, and photography, the course will study the representation of "truth" in documentary with stress on the viewpoint of the artist as manifested in the final work. Students will be required to present a final project in 8mm, 16mm, video, or photo. *Prerequisite:* VA 185A, 186A, 167A, 172/Comm/MP 116, 176, or consent of instructor.

182. History of Experimental Film (4)

An inquiry into the form, meaning, and historical context of works of cinematic art made as a personal means of expression outside the "movie industry". Course will deal with avant-garde films of the 1920s (Dada, Surrealist, German Expressionist, and Soviet Constructivist), American avant-garde cinema of the past two decades will be studied. Focus will be placed on such developments as personal film, structural film, film as poetry, and the expansion of experimental film through various technology and situations. *Prerequisite:* none, VA 84 recommended. Materials fee required.

183. Art of the Silent Cinema (4)

An intensive investigation into the form and meaning of silent cinema, with particular emphasis on interrelationships between film and other arts during the "teens" and "twenties". The European avant-garde film will be studied in detail. Materials fee required.

184. Film in Social Context (4)

This collection of courses gathers under one cover films that are strongly marked by period, geography, 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 work 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.

185A. Film Strategies — 8mm (4)

Using the medium of 8mm films, this production course will explore strategies in film production and familiarize students with the visual grammar and syntax of 8mm film. Specific attention will be paid to camera work, sound, and editing along with developing an awareness of the potentials of the medium. A final project in 8mm film will be required. *Prerequisites:* VA 160, VA 170/Comm/Gen. 100, and VA 84 or consent of instructor.

185B. Film Making — 8mm (4)

This course will stress small three-minute productions. A more critical stance will be taken toward the epistemology and phenomenology of film making and viewing. The student will make several three-minute films and a final three-minute film, all with an eye to increasing the student's ability to deal with complex artistic intention. May be repeated once for credit. *Prerequisite:* VA 185A or consent of instructor.

185C. Adv. Film Production — Super 8/Sound (4)

This course focuses on individual or group projects in super8, sound executed within small production units (length of final film not to exceed five minutes). The course emphasizes editing, single system and production planning. Students provide all film and pay processing. May be repeated once for credit. *Prerequisite: upper-division or graduate status or consent of instructor.*

186A. Film Strategies — 16mm (4)

This production course is designed to heighten the students' understanding of film strategies utilizing the medium of 16mm film. The techniques of camerawork, lighting, editing, sound, printing, and processing will be covered. A final project in 16mm film will be required. *Prerequisite: VA 185A or consent of instructor.*

186B. Film Workshop — 16mm (6)

A theatrical orientation toward the film. Emphasis will be placed on creating the script and on the complexities of creating space and images to make use of the cinema. The meaning of acting in the context of film will be developed and criticized. Differences between acting for film and stage will be emphasized. A ten-minute film will be required for the final project, and it will be critically evaluated. May be repeated once for credit. *Prerequisite: VA 186A or consent of instructor.*

186C. 16mm Film Editing (4)

The course is designed to study the problems of editing from both a theoretical and practical point of view. Films will be studied on the flatbed and students will also edit stock shot film. May be repeated once for credit. *Prerequisite: experience with photography, film, or video.*

186D. Film Animation (4)

Founded in an historical context of personally produced work, beginning with Emile Cohl and continuing through current work by Robert Breer, this production course will cover both the theory and techniques of film animation. 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 a three to five minute 16mm film. May be repeated twice for credit.

186E. Optical Printing — 16mm (4)

This 16mm film production course's fundamental thrust will be to examine how various image manipulation techniques can generate and convey meaning. The course must necessarily operate at a highly advanced technical level and its initial weeks will introduce students to the VA optical printer, animation camera, and similar equipment. A representative sampling of optically printed films will be shown and studied for both meaning and technique. Knowledge of photographic and camera fundamentals is virtually necessary, and a high degree of personal motivation is absolutely necessary. A short finished film will be required at the end of the course. May be repeated once for credit. *Prerequisite: consent of instructor.*

187. 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.

188. Hard Look at the Movies (4)

Examine 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.*

189. 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. May be repeated for credit three times. Materials fee required. *Prerequisite: VA 84.*

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 for credit three times. (P/NP 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. (P/NP grades only.)

199. Special Studies in the Visual Arts (4)

Independent reading, research, or creative work under direction of a faculty member. (P/NP grades only.) *Prerequisites: department and provost approvals required.*

Graduate**204. Performance (4)**

This is a graduate course investigating the possibilities of performance in the field of art. May be repeated for credit.

205. Advanced Problems in Drawing (4)

Students will be given the opportunity to explore the relation between their own energy and idiosyncrasies as draftsmen artists and the quasi-objective demands of representing various types of real and virtual space. May be repeated for credit.

206. Advanced Problems in Painting (4)

A studio course in painting, stressing individual problems. May be repeated for credit.

207. Advanced Problems in Sculpture (4)

A course in sculpture stressing individual problems. May be repeated for credit.

208. History of Performance (4)

The course will survey the origins and development of performance, a current art-making mode combining theater and sculpture, etc. Both New York and West Coast performances will be discussed as well as the issues of critical criteria for this new art form.

213. Sociology of Primitive Art (4)

A graduate-level primitive art history course which will analyze and question theories on what the "arts" of nonliterate people can tell us about their culture.

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* specified for eventual interlocution, encoded into its structure? Previous theoretical approaches to these issues will be examined, alternative analytical models suggested, and these tested in detailed analyses of specific works of art.

216. The Object (4)

An inquiry into the world of artifacts (some of them "works of art") by which man is surrounded, and the ways in which they function as agents of communication and modifiers of consciousness.

217. Modern Points of View (4)

Course will be structured thematically (Marxist, psychoanalytic, Formalist viewpoints, etc.) and chronologically — Diderot through the nineteenth century (with emphasis on Baudelaire) to the present.

218. Marcel Duchamp (4)

A critical examination of the work of the most radical of the twentieth-century artists.

219. Models of Perception (4)

An examination of historical "models" employed as techniques of visual perception, including topics such as the functions of the eye and brain, psychopathology of perception, artists and drugs, socio-religious convention, and perspectival techniques. Seminar will conclude with problems concerning artistic freedom, liabilities and license. Oral presentations of papers. Guest speakers from medicine and psychology. *Prerequisite: open to graduate students and qualified undergraduates.*

220. Contemporary Art History (4)

The course will deal with the themes and problems that have arisen recently in twentieth century painting, sculpture, and art criticism.

221. The Artists in the Late Twentieth Century (4)

This seminar will examine the development of art-making attitudes, and attitudes towards the uses of art, as aspects of broader cultural patterns evolving under the pressures of postindustrialization. *Prerequisite: graduate status or consent of instructor.*

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.*

223. Problems in Dutch Painting (4)

Each member of the seminar will undertake a research project focusing on Dutch art ranging from the fifteenth through the seventeenth century and will report on it both orally and in writing. *Prerequisite: graduate status or qualified undergraduates with consent of instructor.*

230. Advanced Problems in Art Criticism (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.

235. Criticism (4)

This course will concentrate on teaching graduate students to articulate critical positions vis-a-vis their own work and that of their contemporaries. At least three papers will be required. Can be repeated twice for credit.

236. Art Criticism (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 critics, 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. Advanced Projects in Art (4)

This course is designed to help articulate the work of advanced students and is developed along lines varying according to the faculty member directing the course. May be repeated for credit.

244. Charting and Subject Matter (4)

This course focuses on a methodology for establishing autobiographical material, ordering it and presenting it in various media.

266. Advanced Problems in Photography (4)

An advanced study of the aesthetic and technical problems of photography and the relationship of photographic image to cultural phenomena in general. May be repeated for credit. Materials fee required.

275. Graduate Video Production (4)

An intensive workshop in the use of video as an art form. Concept, script, shooting, editing, and sound will be explored. Will include individual and group projects. *Prerequisite: consent of instructor.*

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. Materials fee required.

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: VA 186B or consent of instructor.*

286. Advanced Film Workshop (4)

For the most advanced graduate students who have a grasp of the fundamentals of film making, this course will be primarily concerned with the application of technique to the creation of specific images. *Prerequisite: VA 186B or consent of instructor.*

288. Advanced Problems in Film (4)

A film course dealing with all aspects of film criticism and film writing, stressing individual problems. May be repeated for credit. Materials fee required.

290. Graduate Seminar (3)

A course in art theory and practice in which graduate students relate their own work to one of the several traditions in present art or develop their rationales for rejecting these traditions and developing differently. Required of first-year graduate students.

294. 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.*

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 (1-3)

Apprentice teaching in undergraduate courses given or participated in by the Department of Visual Arts. Graduate students are required to teach a minimum of one quarter — three units — to fulfill degree requirement.

WARREN COLLEGE

OFFICE: Office of the Provost,
Building 302, Warren College

The Writing Program

The foundation of the Warren College Writing Program is Warren College 10A-10B, which is required of every Warren College student and should be taken in the freshman year. The purpose of this course is to teach students to communicate authentically in writing through constant practice and editing, and to criticize with a sense of the varying demands of varying contexts. Classes are small and focus on group criticism of student work; responsibility for the success of the class rests with the students as well as the instructor. Frequent individual conferences with instructors are encouraged. Warren College 10A concentrates on overcoming hesitancy to write, building facility and fluency, and increasing sensitivity to language and the basic structures of prose. The class typically works from free writing through narrative toward argument. Warren College 10B focuses on teaching students to maintain the authentic voice developed in 10A, while stressing writing that is argumentative rather than narrative, and deals with material drawn from secondary sources and texts. This second quarter focuses particularly on responsible use of evidence and critical observation of the social environment. Students are required to write a minimum of eight thousand words per quarter. Warren College 10A-10B is

offered P/NP only, and students may not test out of this requirement.

10A-10B. The Writing Course (4-4)

A workshop course in writing required of all Warren College students. Students will be taught to use writing as a skill and discipline. By the end of the second quarter of the course, students should be able to communicate in whatever form they wish. *Prerequisite: facility in the use of English as a language. (P/NP grades only.)*

11. Writing Workshop (4)

An advanced writing course for those who have completed the writing requirement of their college, offering complete freedom of choice in the form of writing to be done. The course will include weekly presentation and criticism of work in progress. *Prerequisite: Warren College 10A-B or equivalent.*

12. Poetry (4)

The emphasis in this course will be on the particular problems encountered in the writing of poetry and will include the study of some modern American poets. Weekly presentation and criticism of work will be required. *Prerequisites: Warren College 10A-B or equivalent and consent of instructor.*

13. Research Writing (4)

This course will focus on a large-scale investigative project more complex than the average term paper. Research methods, modes of argument, epistemological problems, and the various stages of construction of a large research project will be covered. *Prerequisites: Warren College 10A-B or equivalent and consent of instructor.*

14. Technical Writing (4)

This course will deal with the creation of papers and reports suitable to the disciplines of science and engineering as well as problems encountered in writing for professional and/or popular audiences. Weekly presentation and criticism of work in progress will be required. *Prerequisites: Warren College 10A-B or equivalent and consent of instructor.*

15. Journalism (4)

This course deals with the special demands of journalistic writing, along with some consideration of the practical day-to-day experience of finding, researching, and writing stories for a particular audience, with strict deadlines. *Prerequisites: Warren College 10A-B or the equivalent and consent of instructor.*

16. Writing for Publication (4)

Emphasis will be on the practical business of finding a market and selling one's work. This course will include weekly presentation and criticism of work in progress. *Prerequisites: Warren College 10A-B or equivalent and consent of instructor.*

17. Public Speaking (4)

Through lectures and practice, students will gain an understanding of the principles of verbal and nonverbal communication, and will develop the skills in organization and delivery necessary for the effective communication of ideas. *Prerequisite: consent of instructor.* NOTE: Warren College 17 does not count toward a minor in writing in Warren College.

199. Special Projects (4)

Special projects in writing and related topics for students who desire work beyond the normal courses available. P/NP grades only. *Prerequisite: upper-division status.*

The Academic Internship Program

The Academic Internship Program is designed to enhance a student's education by providing off-campus internship experiences. The program gives students the opportunity to gain practical experience as a complement to their classroom education.

While on internship, students work ten to forty hours per week for a public or private organization. Placements are designed so that each student's major area of academic study is matched with a sponsoring organization's activities. Stu-

dents might work in a political office in Washington, D.C., a conservation group in San Francisco, a legal-aid office on Los Angeles, a medical laboratory in San Diego, or any number of other possibilities.

While "on assignment" students are supervised by an agency sponsor. In addition, each student has a faculty sponsor who evaluates the student's written report of the field studies experience. Upon satisfactory completion of all requirements, the student will earn four, eight, twelve, or sixteen units, repeatable up to sixteen units.

The Academic Internship Program is a valuable form of professional training which provides students the opportunity to test their career interests in an off-campus setting. The field studies program is also a research opportunity which encourages students to test personally academic theory and principles.

Students planning an academic internship should see the coordinator 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 years.

197. Academic Internship Program (4-16)

Individual placements for field learning which are integrated with academic programs will be developed and coordinated by the college. 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 pre-enrollment period. *Prerequisites: consent of instructor and submission of a written contract.*

The Health Professions Program

The Health Professions Program (HPP), supported by the Commonwealth Fund, was developed jointly by Warren College and The School of Medicine in order to combine rigor and breadth in the undergraduate education of health professionals. Its aim is to provide rich educational experience which includes the relevant social sciences and humanities without sacrificing the essential natural sciences. Students are selected at the end of their first year according to the following criteria: academic achievement and SAT scores; health-care related experiences; recommendation from discussion leaders for Warren Writing 10C; and quality of essay (included in application to the program), which assesses students' interest in the interdisciplinary approach to health care provided by the program.

Candidates for the HPP are required to have taken, or be enrolled in, the following courses (or their equivalents): Math 2A-B-C, Writing 10A-B-C, Chemistry 4A-B-C, Chemistry 4AL, and two or three electives.

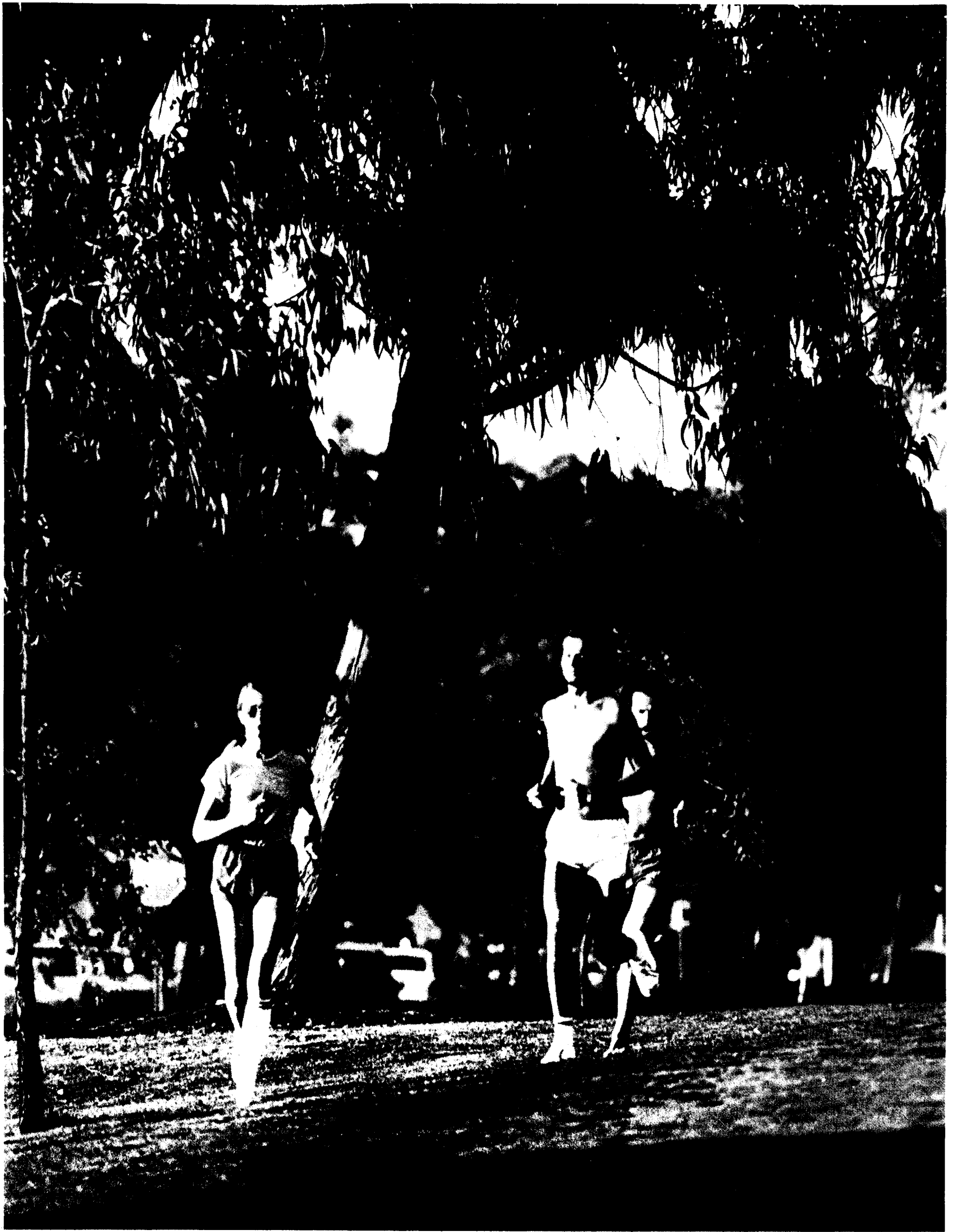
Students admitted to the HPP complete both a minor in "Health Care — Social Issues" and "core" courses (Biology 5A-B-C, Warren 52, and a year-long academic internship including thesis research). Students are also required to do two quarters of volunteer work in a health-care setting. The minor is composed of Warren Writing 10C, a two-quarter introductory sequence in philosophy or one of the social sciences, an upper-division biomedical ethics course, and two other upper-division courses selected from a list of acceptable offerings sponsored by social science and humanities departments on campus. The aim of this upper-division course work is to give students training in social science methodologies, using biomedical issues as the raw material. Students must submit acceptable minor petitions to both the HPP and provost's offices.

10C. Biomedical Writing — A Multidisciplinary Approach (4)

This course is based on writing skills developed in the required writing courses and is focused sharply on how these skills can be used to organize and communicate interdisciplinary knowledge related to the various health professions. Revised and finished writing is emphasized. *Prerequisites:* completion of the college writing requirement and consent of the instructor.

52. Health Care Communications: Context and Methodology (2)

This course will provide students with a basis in communications theory, which they will apply to their field work in various health care settings. Emphasis will be placed on refining communications skills. *Prerequisites:* sophomore standing and consent of instructor.



Appendix

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.

Affirmative Action Policy

The University of California, in compliance with Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973, does not discriminate on the basis of race, color, national origin, religion, sex or handicap in any of its policies, procedures, or practices. This nondiscrimination policy covers admission and access to, and treatment and employment in, University programs and activities, including, but not limited to, academic admissions, financial aid, educational services, and employment.

Inquiries regarding the University's equal opportunity policies (race, color, national origin, religion, sex, and handicap) may be directed to the Dean of Student Affairs, Student Center (B-023), La Jolla, California 92093, telephone 714-452-4370.

Accessibility and Confidentiality of Student Records

Under the provisions of the Family Educational Rights and Privacy Act of 1974, every student is accorded the right to inspect and review education records directly related to the student's status as a student that are held by any unit or department on the campus.

The right of inspection is available to students who are or have been in attendance and extends to those materials which are intended for university use or which are available to parties outside the university system. Third parties shall not have access to education records or information pertaining to students as students without the written consent of the particular student about whom such information is sought.

Student requests to inspect education records pertaining to their status as students shall be

granted within forty-five days after the request has been made. (Students shall have an opportunity for a hearing to challenge the content of the records to insure that the records are not inaccurate, misleading, or otherwise in violation of their privacy or other rights, and to provide an opportunity for the correction or deletion of any such inaccurate, misleading, or otherwise inappropriate data contained therein.)

The full text of the Family Educational Rights and Privacy Act of 1974 is available at these locations:

1. Office of the Vice Chancellor and Dean of Student Affairs, Student Center;
2. Office of Admissions and Registration, 102 Administrative Complex;
3. Central University Library;
4. Provosts' Offices of Revelle, Muir, Third, and Warren Colleges; and,
5. Office of the Dean of Graduate Studies and Research, 103 Administrative Complex.

Salary and Employment Information

Field of Study	Degree Level of Graduates		
	Bachelor's	Master's	Doctorate
	Average Monthly Salary ¹		
Engineering	\$930-1,290	\$1,030-1,410	\$1,260-1,840
Humanities	510- 935	665-1,200	
Life Science	545-1,000		
Management		1,100-1,545	
Physical Science	760-1,260		1,280-1,720
Social Science	550- 975	730-1,180	
	Probable or Definite Job Commitment ²		
Engineering			77.4%
Humanities			59.2
Life Science			66.0
Management			80.7
Physical Science			70.5
Social Science			56.6

¹Source: A national survey of a representative group of colleges conducted by the College Placement Council, representing the eighty percent range of offers throughout the country. It should be noted that a wide variation in starting salaries exists within each discipline based on job location, type of employer, personal qualifications of the individual, and employment conditions at the time of job entry.

²Source: *The Job Market for UCLA's 1974 Graduates*. Percentages are based only upon those students who planned to work immediately after graduation.

University Professors

The title University Professor is reserved for scholars of international distinction who are recognized and respected as teachers of exceptional ability. Appointments to this title are permanent, and may be made from among the distinguished tenured staff of the University of California, or from individuals outside the University.

University Professors are available for inter-campus travel for purposes of discussions with staff and students on subjects related to research, teaching, and other matters of interdisciplinary interest.

University Professor Emeritus, **Melvin Calvin**
Laboratory of Chemical Biodynamics
Lawrence Berkeley Laboratory
UC Berkeley
Berkeley, CA 94720

University Professor **Murry Krieger**
Department of English and Comparative Literature
Humanities Office Building
UC Irvine
Irvine, CA 92664

University Professor Emeritus,
Josephine Miles
Department of English
454 Wheeler Hall
UC Berkeley
Berkeley, CA 94720

University Professor Emeritus,
Glenn T. Seaborg
Department of Chemistry
Associate Director
Lawrence Berkeley Laboratory
Berkeley, CA 94720

University Professor **Neil J. Smelser**
Department of Sociology
490 Barrows Hall
UC Berkeley
Berkeley, CA 94720

University Professor Emeritus,
Edward A. Teller
501F Building 111; P.O. Box 808
Lawrence Livermore Laboratory
Livermore, CA 94550

University Professor **Charles H. Townes**
Department of Physics
557 Birge Hall
UC Berkeley
Berkeley, CA 94720

University Professor Emeritus, **Harold C. Urey**
Department of Chemistry
5314 Mayer Hall
UC San Diego
La Jolla, CA 92093

University Professor Emeritus,
Sherwood L. Washburn
Department of Anthropology
232 Kroeber Hall
UC Berkeley
Berkeley, CA 94720

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Lynn T. White, Jr.
Department of History
6345 Bunche Hall
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UC San Diego Facts and Figures (as of Spring, 1980)

On-campus student enrollment (Spring Quarter)

Undergraduate	8,141
Muir	2,511
Revelle	1,962
Third	1,675
Warren	1,993
Graduate	1,323
Medical School (excluding 418 interns and hospital residents)	491
Total Students	9,955

On-campus teaching faculty

members	810
Fellows, National Academy of Sciences	52
Fellows, American Academy of Arts and Sciences	49
Nobel Prize Laureates	6

Total land area — U C San Diego

Main campus	1,211
Outlying areas	703
Total Acres	1,914

Books in Library collection	1,313,761
University Extension Enrollment	10,000

Grade-point averages

Lower-division undergraduate	2.83
Upper-division undergraduate	3.06
Graduate	3.80

Number of undergraduates in ten most popular majors (Spring, '80)

Biology	1,653
Psychology	505
Chemistry	303
Electrical Engineering and Computer Sciences	713
Applied Mechanics and Engineering Sciences	564
Literature	303
Communications	383
Economics	467
Political Science	311
Sociology	199

Based upon previous three years' experience, 89.7% of all undergraduates enrolled at UC San Diego in the fall quarter will also be enrolled for the spring quarter. Questions or requests for more detailed information should be directed to the Office of the Associate Vice Chancellor-Planning.



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

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 - I have been accepted at UC San Diego.
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 - Junior Senior
 - I am a two-year college student, four-year college student, contemplating transfer.
 - I am in college, contemplating graduate study in _____ (subject).
 - 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 an applicant (or prospective applicant).
 - I reside in California.
 - I reside in another state.
 - I am a student at UC San Diego, Freshman Sophomore
 - Junior Senior
 - Graduate Student _____ (subject).
 - Medical Student
 - I am a faculty member at UC San Diego.
 - I am a staff member at UC San Diego.
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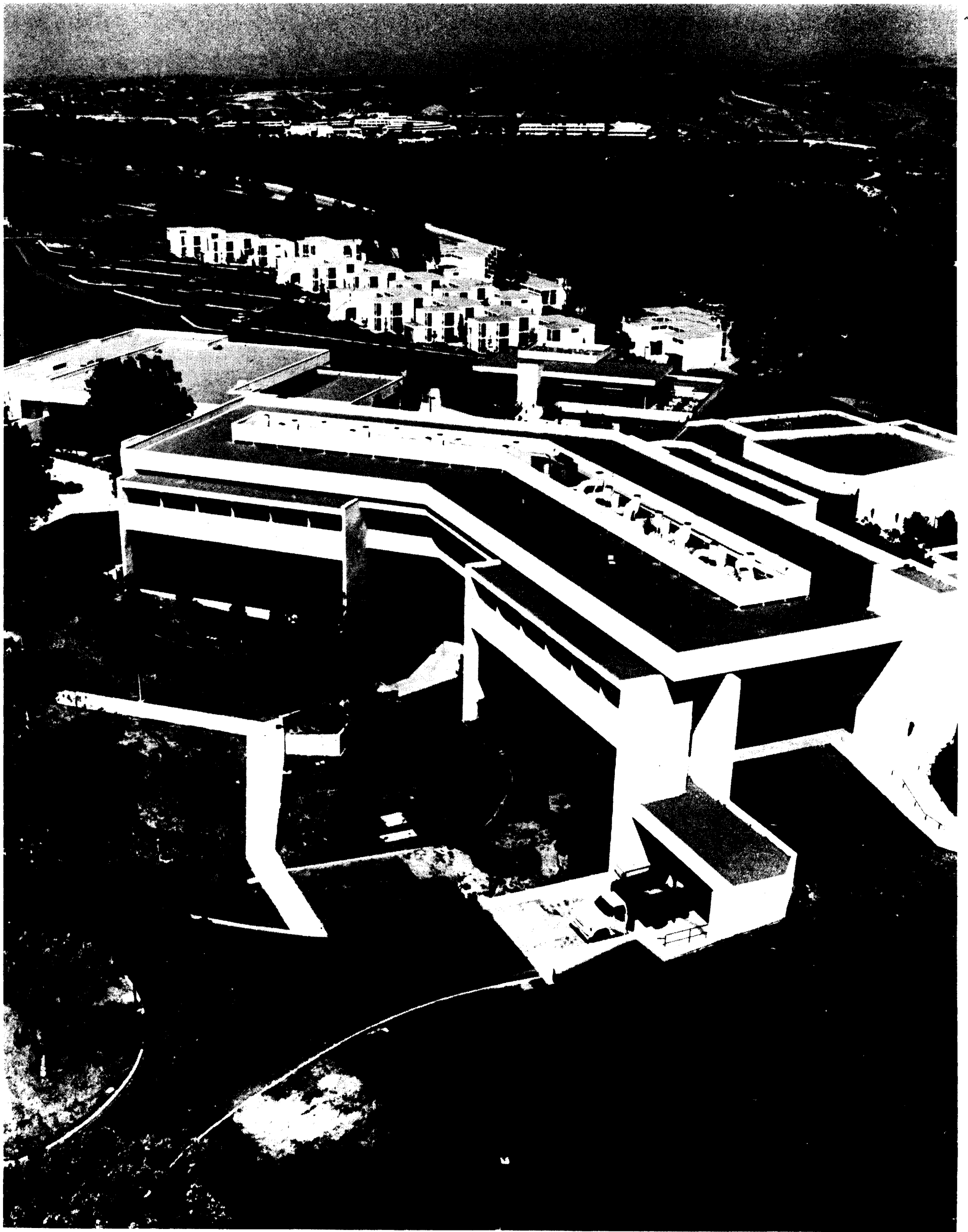
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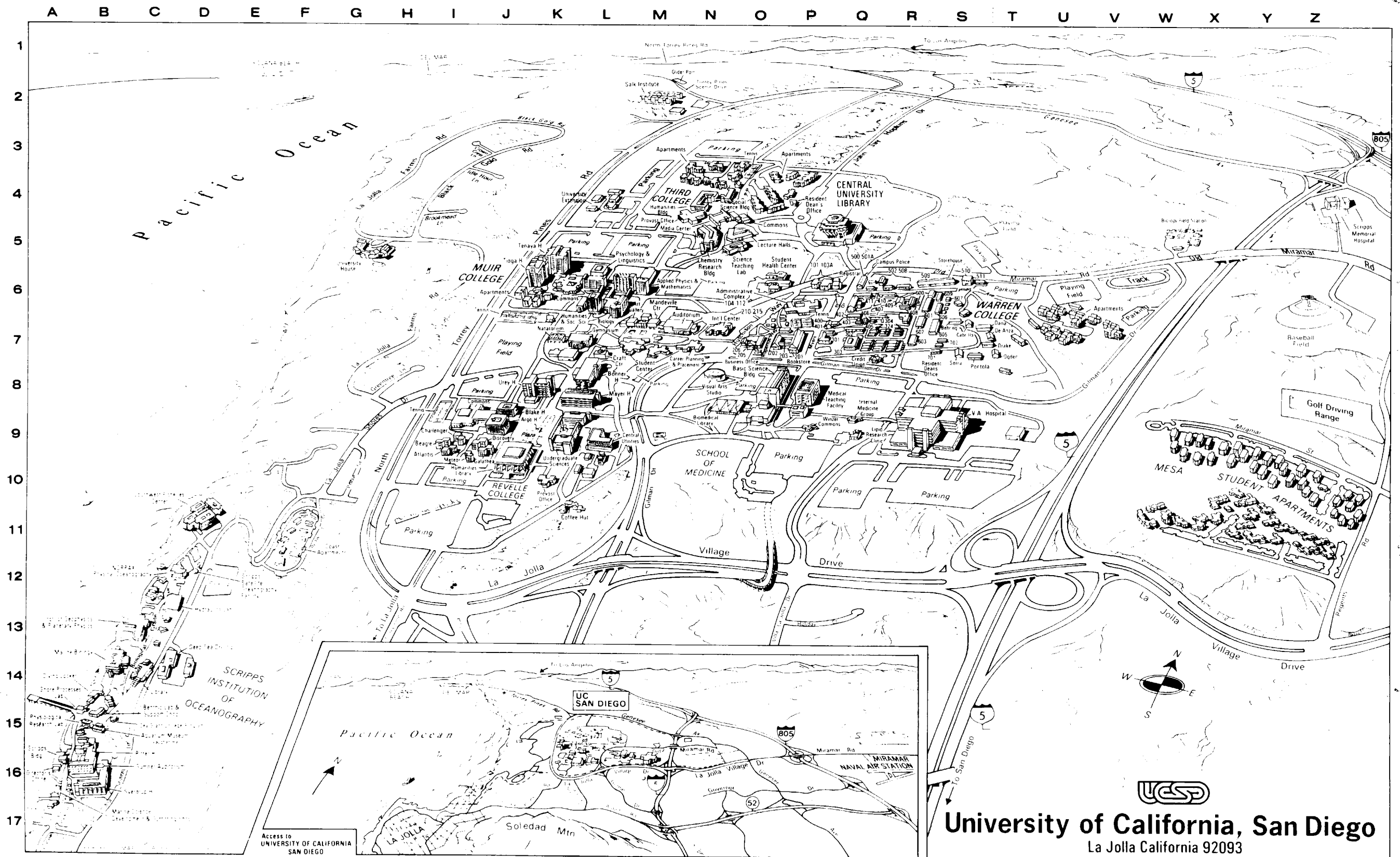


Legend

University of California, San Diego Academic Offices

Academic Senate	O-7	Mall Services	S-6	Scripps Institution of Oceanography	
Accounting	P-7	Mandeville Art Gallery	M-7	Aquarium-Museum (Vaughan Hall)	B-15
Administrative Complex	P-6	Mandeville Auditorium	N-7	Benthic Laboratory	B-15
Affirmative Action	N-7	Mandeville Center	M-7	Deep Sea Drilling	C-14
Alumni & Development	P-6	Mayer Hall	L-8	Director's Office	A-16
Applied Physics & Mathematics Bldg	M-6	Media Center/Communications	N-4	Diving Locker	B-14
Architects & Engineers	O-7	Medical Teaching Facility	P-8	Hydraulics Laboratory	C-12
Argo Hall	J-9	Mesa Apartments	Y-10	Inst. of Geophysics & Planetary Physics	C-13
Atlantis Hall	I-9	Meteor Hall	I-9	Inst. of Marine Resources (Ritter Hall)	B-16
Baseball Field	Z-7	Muir College Apartments	K-6	Library	C-14
Basic Science Bldg. (School of Medicine)	O-8	Muir College Provost (H&SS Bldg.)	L-6	Marine Biology Bldg.	B-14
Beagle Hall	I-9	Muir Commons (Cafeteria)	K-6	Marine Science Development & Outfitting Shop	A-16
Behring Hall	S-7	Natatorium	K-7		
Biology Bldg. (Muir)	L-6	Ogden Hall	T-7		
Biomedical Library	N-8	Parking Office	Q-7		
Blake Hall	J-8	Personnel	Q-6	Anthropology, room 8012 Humanities & Social Sciences Bldg.	
Bonner Hall	L-8	Physical Plant Dept.	S-6	Applied Mechanics and Engineering Sciences (AMES), room 5202 Urey Hall	
Bookstore	P-7	Planning Office	P-6	Biochemistry, room 4422 Mayer Hall	
Budget Office	P-6	Police	Q-6	Biology, room 2130 Bonner Hall	
Buildings & Grounds	R-6	Portola Hall	S-7	Biophysics, room 3430 Mayer Hall	
Business Office (108 Adm. Com.)	P-6	Post Office	J-9	Chemistry, room 2112 Urey Hall	
Cabrillo Hall	S-7	Psychology & Linguistics Bldg.	L-6	Chicano Studies, room 2072 Humanities & Social Sciences Bldg.	
Cancer Research Facility	Q-7	Pub (food)	M-7	Chinese Studies, room 8004 Humanities & Social Sciences Bldg.	
Career Planning & Placement	N-7	Public Information (Bldg. 407)	Q-7	Classical Studies, room 5016 Humanities & Social Sciences Bldg.	
Cashier	P-7	Publications Office (Bldg. 407)	Q-7	Communications, room 133 Media Center/Communications Bldg.	
Center for Music Experiment	R-6	Receiving/Storehouse	S-6	Comparative Studies in Language, Society and Culture, room 1532 Humanities-Library Bldg.	
Central Box Office	M-7	Registrar/Admissions	Q-6	Contemporary Issues, room 2024 Humanities & Social Sciences Bldg.	
Central University Library	Q-5	Relations with Schools	Q-6	Cultural Traditions, room 2024 Humanities & Social Sciences Bldg.	
Central Utilities	L-9	Religious Affairs	R-6	Drama, room 2550 Humanities-Library Bldg.	
Challenger Hall	I-9	Revelle Commons (Cafeteria)	I-9	Earth Sciences, room 1512 Humanities-Library Bldg.	
Chancellor's Office (107 Adm. Com.)	P-6	Revelle College Provost	K-10	Economics, room 225 Social Science Bldg.	
Chemistry Research Bldg.	N-5	School of Medicine	O-8	Education Abroad Program, International Center	
Coast Apartments	F-11	Science Teaching Laboratory	O-5	Electrical Engineering and Computer Sciences (EECS), room 3216 Applied Physics & Mathematics Bldg.	
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Conference Room 111A	P-6	Social Science Bldg. (Third)	N-4	Iberian and Latin-American Studies, room 1260 Humanities-Library Bldg.	
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Courses by Newspaper	L-4	Student Employment	P-7	Language, Language Center, room 2125 Psychology & Linguistics Bldg.	
Craft Center	L-7	Student Health Center	O-6	Linguistics, room 5237 Psychology & Linguistics Bldg.	
Credit Union	Q-7	Summer Session	P-6	Literature, room 115 Humanities Bldg.	
Dana Hall	T-7	Telecommunications Office	L-9	Mathematics, room 7313 Applied Physics & Mathematics Bldg.	
Day Care Center	T-7	Tenaya Hall	K-5	Muir writing Program, Provost's Office, Muir College	
DeAnza Hall	T-7	Theatre Box Office	P-7	Music, room 110 Mandeville Center for the Arts	
Discovery Hall	J-9	Third College Apartments	N-4	Natural Sciences, Provost's Office, Revelle College	
Drake Hall	T-7	Third College Commons (Cafeteria)	O-4	Neurosciences, room 3034 Basic Science Bldg.	
Employment Office	Q-6	Third College Lecture Halls	O-5	Philosophy, room 3112 Humanities-Library Bldg.	
Financial Aids	P-7	Third College Provost	N-4	Physical Education, Gymnasium	
Food Administration	O-7	Third College Resident Dean	P-4	Physics, room 3426 Mayer Hall	
Galathea Hall	J-9	Tioga Hall	K-6	Physiology and Pharmacology, room 1046 Basic Science Bldg.	
Garage (Trans. Services)	S-7	UCSD Theatre	P-7	Political Science, Building 412, Warren College	
Graduate Studies	P-6	Undergraduate Sciences Bldg.	K-9	Psychology, room 5217 Psychology & Linguistics Bldg.	
Graphic & Reproduction Services	S-6	University Events Office	N-7	Science and Technology, room 106 Chemistry Research Bldg.	
Gymnasium	L-7	University Extension	L-4	Science, Technology and Public Affairs, Building 412, Warren College	
Health & Safety	O-7	University House	G-5	Scripps Institution of Oceanography, room 1156 Ritter Hall	
Housing (On Campus)	O-7	Urey Hall	K-8	Sociology, room 7001 Humanities & Social Sciences Bldg.	
Housing (Off Campus)	N-7	Veterans Administration Hospital	R-9	Subject A, room 2346 Humanities & Social Bldg.	
Humanities Bldg. (Third)	N-4	Visual Arts Studios	N-8	Teacher Education Program, Media Center/Communications Bldg.	
Humanities-Library Bldg.	J-9	Warren Cafeteria	R-6	Third College Composition Program, room 132 Humanities Bldg.	
Humanities & Social Sciences Bldg.	L-6	Warren College Apartments	U-7	Third World Studies, room 122 Humanities Bldg.	
Ice Cream Hustler	J-8	Warren College Provost (Bldg. 302)	Q-7	Urban and Rural Studies, room 235 Humanities Bldg.	
Information (Public)	Q-7	Warren College Recreation Center	S-6	U.S.-Mexican Studies Program, Building 402, Warren College	
Information (Student)	L-7	Warren College Resident Dean	S-7	Visual Arts, room 214 Mandeville Center for the Arts	
Internal Medicine Group	Q-9	Winzer Commons (Cafeteria)	P-9	Warren College Writing Program, Provost's Office, Warren College	
International Center	N-7	Word Processing Center	R-7		
Lipid Research Clinic	Q-9				

Campus Map





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