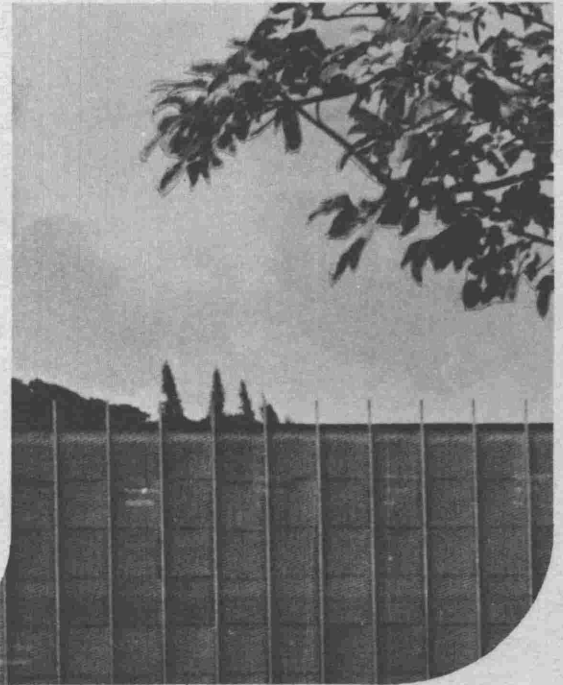


AUG 15 8 28 AM '71



Hawn  
LG 961  
H 4A13  
cop. 2

University of Hawaii Bulletin  
1971/72 Graduate Division Catalog

UNIVERSITY OF HAWAII BULLETIN

Volume L, Number 4, September 1971

The University of Hawaii Bulletin is  
published quarterly at the University  
of Hawaii, Honolulu, Hawaii, U.S.A.

Entered as second-class matter at the  
Post Office at Honolulu, Hawaii,  
November 14, 1921, under Act of  
Congress of August 24, 1912.

Price 50 cents plus postage

## 1971-72 UNIVERSITY CALENDAR

September 1971	October 1971
S M T W T F S	S M T W T F S
1 2 3 4 5 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">6</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">7</span> 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">11</span> 12 13 14 15 16 17 18 19 20 21 22 23 24 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">25</span> 26 27 28 29 30 31
November 1971	December 1971
S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">25</span> 26 27 28 29 30	1 2 3 4 5 6 7 8 9 10 11 12 13 14 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">15</span> 16 17 18 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">19</span> 20 21 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">22</span> 23 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">24</span> 25 26 27 28 29 30 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">31</span>
January 1972	February 1972
S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">24</span> 25 26 27 28 29 30 31	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">21</span> 22 23 24 25 26 27 28 29
March 1972	April 1972
S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">27</span> 28 29 30 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">31</span>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">1</div> 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
May 1972	June 1972
S M T W T F S	S M T W T F S
1 2 3 4 5 6 7 8 9 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">10</span> 11 12 13 14 15 16 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">17</span> 18 19 20 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">21</span> <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">22</span> 23 24 25 26 27 28 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">29</span> 30 31	1 2 3 4 5 6 7 8 9 10 11 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">12</span> 13 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">14</span> 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
July 1972	August 1972
S M T W T F S	S M T W T F S
1 2 3 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">4</span> 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">21</span> 22 23 24 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">25</span> 26 27 28 29 30 31	1 2 3 4 5 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">6</span> 7 8 9 10 11 12 13 14 15 16 17 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">18</span> 19 20 21 22 23 24 25 26 27 28 29 30 31

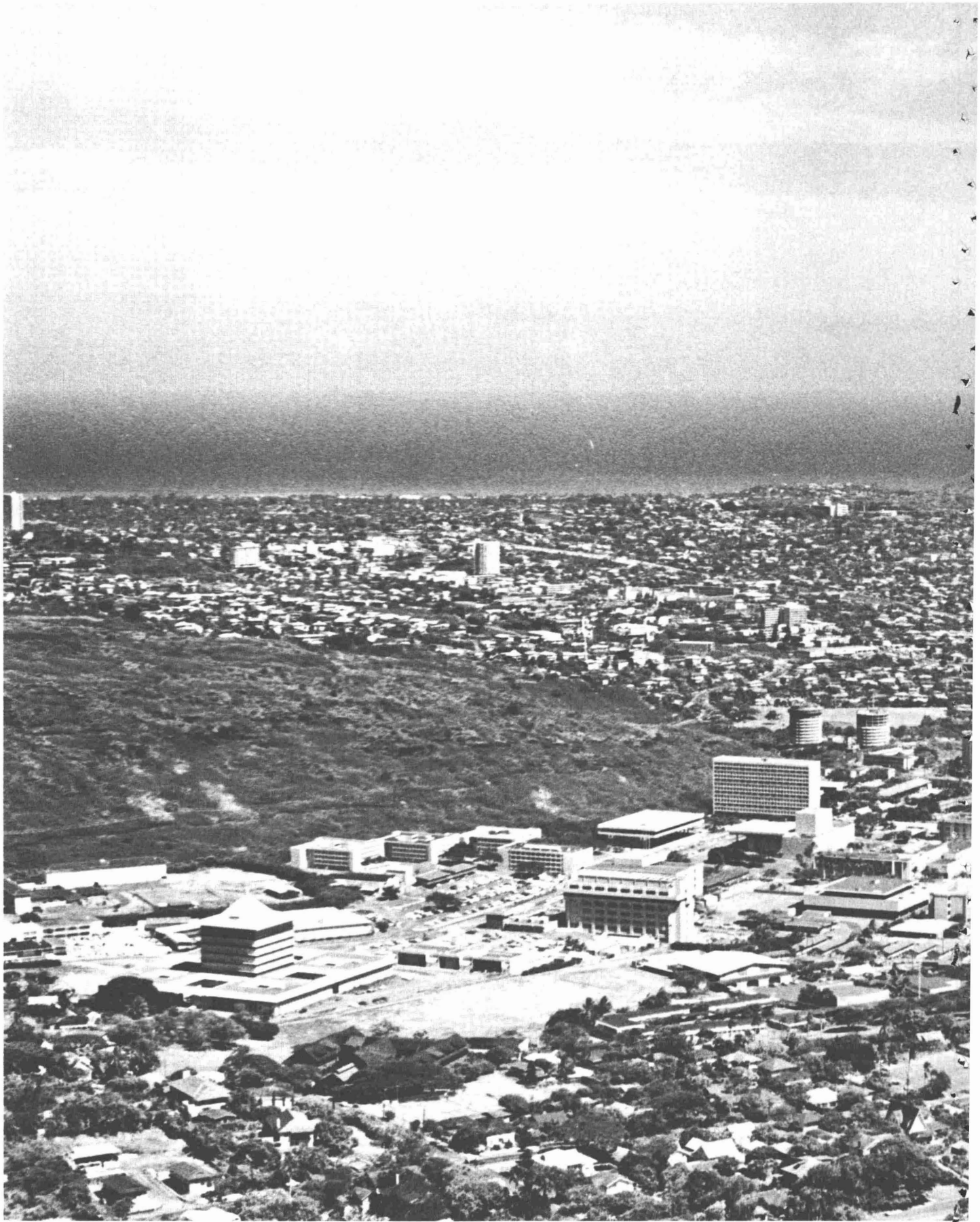
	First Semester	Second Semester	Summer Session I	Summer Session II
Last day to file <i>applications and renewals</i> of application for graduate admission .....	Mar. 1	Sep. 1	(Applications accepted for Fall and Spring semesters only)	
Last day to file returnee forms for students returning after an absence .....	June 1	Nov. 1		
Last day to file petition for admission to doctoral program (only by currently enrolled UH master's candidates graduating at end of semester) .....	May 1	Nov. 1		
Registration .....	Aug. 30	Jan. 17	Jun. 13	Jul. 24
Instruction begins .....	Sep. 7	Jan. 24	Jun. 14	Jul. 25
Last day of registration for credit .....	Sep. 9	Jan. 26	Jun. 16	Jul. 28
Last day to change from audit to credit .....	Sep. 9	Jan. 26	Jun. 16	Jul. 28
Last day to add courses for credit .....	Sep. 9	Jan. 26	Jun. 16	Jul. 28
Last day of withdrawal from courses .....	Sep. 10	Jan. 28	Jul. 14	Aug. 25
Last day to process Credit-No Credit option .....	Sep. 10	Jan. 28	Jul. 14	Aug. 25
Last day to change from credit to audit .....	Sep. 10	Jan. 28	Jul. 14	Aug. 25
Last day to file diploma applications .....	Sep. 27	Feb. 14	Jun. 23	Aug. 4
Last day of removal of incompletes from previous semester .....	Nov. 24	Apr. 14		
Last day for final examinations, Plan A and Ph.D. ....	Nov. 22	Apr. 17	Jul. 5	Aug. 14
Theses and dissertations due in Graduate Division .....	Nov. 29	Apr. 24	Jul. 5	Aug. 14
Last day for submission of Plan B final exam results .....	Dec. 6	May 1	Jul. 12	Aug. 21
Last day for titles of theses & dissertations to be filed with Graduate Division .....	May 15	Jan. 15	Feb. 1	Feb. 1
Last day of instruction .....	Dec. 15	May 10	Jul. 21	Sep. 1
Final examinations begin ..	Dec. 16	May 11		
Term ends .....	Dec. 22	May 17		
Commencement .....	Dec. 19	May 21	Aug. 6	(none)

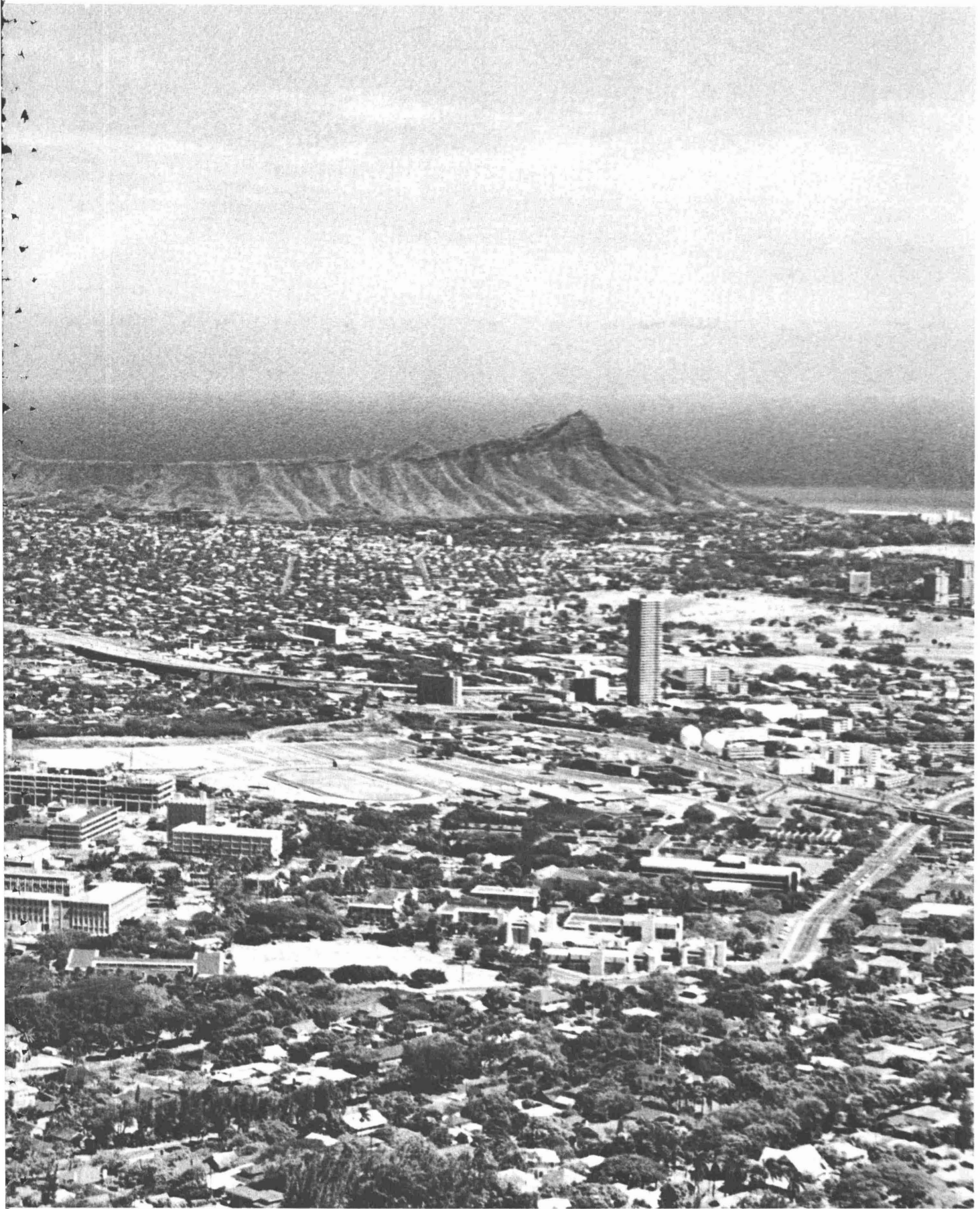
- Academic dates of significance.
- Holidays and recesses.

# Contents

	Page		Page
GENERAL INFORMATION .....	7	DEGREES, REQUIREMENTS AND PROCEDURES .....	24
Research and Service Operations .....	8	MASTER'S DEGREES .....	24
International Programs .....	12	Residence .....	24
Tuition and Fees .....	12	Time Allowed .....	24
Scholarships and Fellowships .....	13	Transfer of Credits .....	24
Financial Aids .....	13	Progress Report Forms .....	24
Living Accommodations and Expenses .....	14	Rules and Requirements .....	24
Student Health Service .....	14	Plan A (Thesis) .....	25
Counseling and Testing Center .....	15	Credit-Hour Requirements .....	25
Parking and Traffic .....	15	Thesis Requirement .....	25
International Student Office .....	15	Examinations .....	25
Rights of Foreign Students .....	15	Summary of Procedure .....	26
English Language Institute .....	15	Plan B (Nonthesis) .....	26
East-West Center .....	16	Credit-Hour Requirements .....	26
		Examinations .....	26
		Summary of Procedure .....	27
		Plan C (Examinations) .....	27
		Examinations .....	27
		Summary of Procedure .....	27
ACADEMIC INFORMATION .....	19	DOCTOR OF PHILOSOPHY .....	28
Admission .....	19	Residence .....	28
Summer Session .....	20	Credits .....	28
Entrance Examinations .....	20	Language Requirements .....	28
Classification of Students .....	20	Doctoral Committee .....	29
Unclassified Students .....	21	Examinations .....	29
Registration and Credits .....	21	Dissertation .....	29
Course Numbers .....	22	Summary of Procedure .....	30
Credits, Grades and Examinations .....	22		
Credit/No Credit Option .....	22	GRADUATE FIELDS OF STUDY .....	32
Requirements—Continued Registration .....	23		
Diplomas .....	23	INDEX .....	93
Degree Checks .....	23		
Conferring of Degrees .....	23	CAMPUS MAP .....	96
Transcripts .....	23		
Responsibility .....	23		







## GRADUATE DIVISION STAFF

Wytze Gorter, Ph.D., *Dean*  
Howard P. McKaughan, Ph.D., *Associate Dean, Programs and Personnel*  
Morton M. Rosenberg, Ph.D., *Associate Dean, Research and Fellowships*  
Sumie F. McCabe, M.A., *Assistant Dean, Student Services*

## ADMINISTRATIVE OFFICERS

Harlan Cleveland, A.B., LL.D., D.C.L., Litt. D., *President of the University*  
Richard S. Takasaki, B.S., M.A., M.P.A., *Executive Vice-President of the University*  
Stuart M. Brown, B.S., Ph.D., *Vice-President for Academic Affairs*  
Robert M. Kamins, B.A., M.A., Ph.D., *Dean for Academic Development*  
Wytze Gorter, A.A., A.B., Ph.D., *Dean of Graduate Division and Director of Research*  
John P. Craven, B.S., M.S., Ph.D., J.D., *Dean of Marine Programs*  
William W. Parsons, B.S., M.S., LL.D., *Vice-President for Business Affairs*  
H. Brett Melendy, A.B., M.A., Ph.D., *Vice-President for Community Colleges*  
Kenneth K. Lau, B.A., J.D., LL.M., *Secretary of the University*  
Alfred L. Ellingson, B.S., *Dean of Students*



## General Information

The University of Hawaii, the state-supported system of higher education in Hawaii, conducts diverse programs in education, research and service for the state, the nation and the world community. It operates teaching and research facilities at more than 50 locations throughout the Hawaiian Islands and participates in international service and research activities in the Pacific Basin and Asian countries.

Throughout its history, a distinctive geographical and cultural setting has helped the University achieve excellence in certain areas of study. Geographical location has led to concentration in oceanography, marine biology and interdisciplinary studies of tropical environments, problems and resources. Hawaii's physical characteristics have focused interest on natural phenomena in geophysics such as tsunami research, volcanology, astronomy and astrophysics. Hawaii's multiracial culture and its ties with Asia have created a favorable environment for the study of various aspects of diverse cultural systems, including such subjects as linguistics, genetics, philosophy and interracial relations.

The University offers course work leading to the bachelor's degree in 66 fields. The Graduate Division offers work leading toward the master's degree in 65 fields and the doctorate in 34.

In addition to its instructional program, the University conducts organized research in several fields. Special units initiate and conduct research in economics, education, biomedicine, Pacific and Asian linguistics, social sciences, water resources, marine biology, geosciences, astronomy, genetics and agriculture.

The main campus is located in the Manoa Valley section of Honolulu, the capital of the state. The University maintains a second four-year campus at Hilo and there are three community college campuses on Oahu, one each on Hawaii, Maui, and Kauai.

Space observatories and associated research facilities of the University are located on the islands of Maui and Hawaii. The Hawaii Institute of Marine Biology, operated by the University, is located on Coconut Island in Windward Oahu. The University conducts the Center for Cross-Cultural Training and Research (former Peace Corps) with facilities on the island of Hawaii. Branches of the Hawaii Agricultural Experiment Station are located on five of the major islands of the state.

**History.** The University of Hawaii was founded in 1907 as a federal land-grant institution specializing in agriculture and the mechanic arts. Referred to as the College of Hawaii, it was launched with five regular



students and 12 faculty members on a temporary campus in downtown Honolulu. In 1912 the campus was moved to its present location in Manoa where an initial ninety acres were set aside for buildings. With the addition of a College of Arts and Sciences in 1920, the institution became the University of Hawaii.

In the following two decades, the University began to develop a special interest in bridging the East and West. A period of physical and academic expansion followed World War II, and new responsibilities and opportunities for growth were presented to the University when Hawaii became a state in 1959.

In 1960 the federal government created the East-West Center on the Manoa campus. Officially called the Center for Cultural and Technical Interchange between East and West, it aims to promote mutual understanding among the nations of the world through its exchange and service programs.

In 1964 the state legislature authorized the University to operate a state-wide community college system. With four state-owned technical schools for a base, the system's fifth campus in Leeward Oahu opened in 1968, and a sixth in Hilo was added in 1969. The community colleges offer a variety of college transfer and general education curricula on all campuses and award associate degrees.

**Colleges and Schools.** The academic work of the University is administered by seven colleges: Arts and Sciences, Business Administration, Continuing Education and Community Service, Education, Engineering, Health Sciences and Social Welfare, and Tropical Agriculture.

Included in the College of Tropical Agriculture are the Cooperative Extension Service and the Hawaii Agricultural Experiment Station. The School of Travel Industry Management is part of the College of Business Administration. Four professional schools are included in the College of Health Sciences and Social Welfare: School of Medicine, School of Nursing, School of Public Health, School of Social Work. The School of Library Studies is an additional professional school.

Experimental programs such as New College, Ethnic Studies, Liberal Studies and others are offered. An Honors Program embraces all colleges.

The Graduate Division assumes the major role in the organization and development of graduate programs.

**Accreditation.** The University is accredited by the Western Association of Schools and Colleges. Professional programs in the curriculum are individually accredited by appropriate agencies. Students may transfer credits to other American or foreign universities on the same basis as course credits are transferred by other accredited American universities.

**Academic Year.** The academic year is divided into two 17-week semesters, a 12-week Summer Session which offers two 6-week terms, and a 2-week Interim Period between semesters.

**Administrative Organization.** Governance of the University of Hawaii is vested in a board of regents appointed by the governor of the state.

The president of the University serves as executive officer of the board of regents and as such is responsible for educational leadership and is the administrative head of the University. The president's staff includes vice-presidents, the secretary of the University, assistants to the president, an international relations advisory council, and the director of University relations and development.

The administrative council advises the vice-president for academic affairs on matters of academic policy. The faculty senate is similarly advisory to the president and the board of regents.

**Colors, Seal and Motto.** The University of Hawaii colors are green and white. The rainbow, a frequent sight in Manoa Valley, is the campus symbol, and the University teams traditionally are nicknamed "The Rainbows." The University seal contains a torch and book titled *Malamalama* (The Light of Knowledge) in the center of a circular map of the Pacific, surrounded by the state motto, *Ua Mau Ke Ea o Ka Aina i Ka Pono* (The Life of the Land Is Preserved in Righteousness). The University motto, inscribed in both the Hawaiian and English languages on Founders' Gate at the entrance to the Manoa campus on University Avenue, is "Above all nations is humanity."

**Inquiries.** Prospective students should address inquiries to the following offices on the **Manoa Campus**.

*Graduate students:* Graduate Division Admissions Office, 2540 Maile Way, Honolulu, Hawaii 96822.

*General studies:* College of Continuing Education and Community Service, 2500 Dole Street, Honolulu, Hawaii 96822.

*Summer session:* Summer Session Office, Room 101, 2500 Dole Street, Honolulu, Hawaii 96822.

## RESEARCH AND SERVICE OPERATIONS

In addition to the instructional program, the University conducts organized research in several fields and offers other forms of public service. The most important of these operations are described below.

The **Center for Labor-Management Education**, instituted in 1965, is now under the general supervision of the College of Continuing Education and Community Service. Its objectives are to provide basic leadership training for those associated with management and labor, to promote (1) understanding by both groups of the fundamental problems of mutual interest with which they deal; (2) knowledge of the factors which are essential to productive relations between them; and (3) appreciation of the public's interest in the satisfactory solution of their common problems. In addition to its schedule of general courses, the program conducts special courses, one-day and weekend institutes, conferences and staff training programs.

The **Computing Center** operates an IBM 7040-1401 system and an IBM 360/65 system, along with a supporting line of peripheral punched card equipment. It provides services with respect to statistical consultation,

system design, data processing, computing, and educational and reference advice to all the divisions and departments of the University.

In accordance with the legislation which created it, the **Economic Research Center** conducts short- and long-term research studies of direct pertinence to the economic welfare and development of Hawaii. In cooperation with the resident academic departments of the University, the center offers research training to advanced students.

The **Education Research and Development Center** adopts an interdisciplinary behavioral science approach to the conduct of basic and applied research, evaluation and development concerned with educational problems. Activities of the center are directed at obtaining evidence to assist educators in reaching decisions on educational practices. Major programs focus upon understanding of achievement motivation, of conditions influencing educational attainment of different ethnic and socio-economic groups, and of means of optimizing the cognitive learning of school children. Research and development to facilitate educational planning and practice in Hawaii and the Pacific Basin is a primary concern.

The **Division of Educational Broadcasting** is responsible for all of the production and transmission functions of the Hawaii Educational Television Network, which, through its chain of transmitters, serves the entire state of Hawaii. Its studios, located on the University of Hawaii campus, form a production center for the creation of teaching materials broadcast daily into classrooms in the public schools throughout the state. In addition, a wide range of program materials are produced, or acquired from other sources, to serve the general public with information in the arts, political affairs, and public concerns. Direct, college-level teaching materials for "closed circuit" use on campus are also produced, and the studios serve as a laboratory for students in speech and educational communications courses.

The **Environmental Center** was established in 1970 to stimulate, expand, and coordinate education, research, and service efforts of the University related to ecological relationships, natural resources, and environmental quality, with special relation to human needs and social institutions, with particular regard to Hawaii. The center attempts to make most effective the contribution of the University to the problems of determining and maintaining optimum environmental quality. Its membership is composed of those members of the University community actively concerned with ecological and environmental problems.

The **Hawaii Cooperative Fishery Unit** promotes graduate training and research in fishery biology by providing students with support, counseling and facilities. The unit is headquartered in Edmondson Hall and functions academically as part of the department of zoology. Research program centers on the fishery biology and ecology of inshore marine and inland waters. The unit operates under joint sponsorship of the University, the Hawaii Department of Land and Natural Resources—

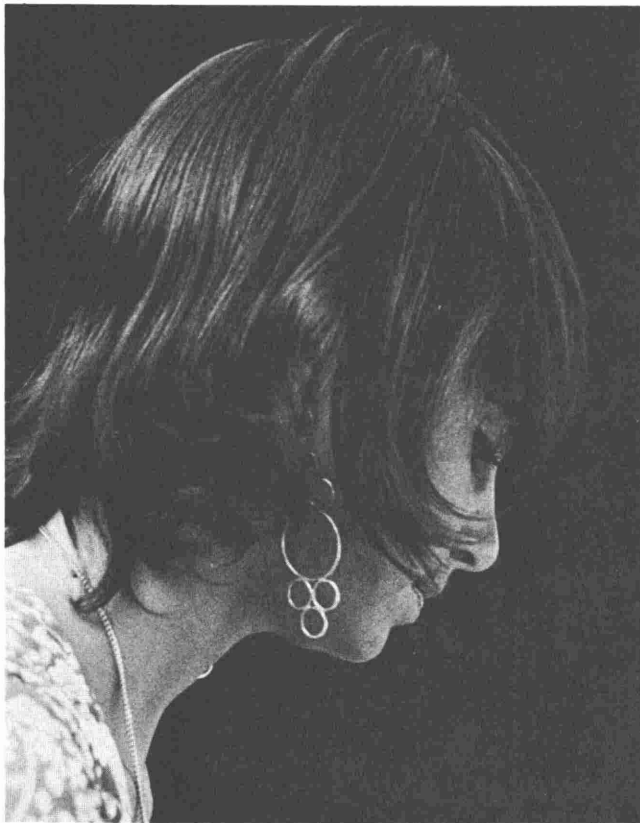
Division of Fish and Game, and the U.S. Bureau of Sport Fisheries and Wildlife, Division of Fishery Services.

The **Hawaii Institute of Geophysics** was organized to take advantage of the unique position of Hawaii as a national laboratory for conducting geophysical research in the broad field of the earth sciences. In cooperation with academic departments devoted to the physical sciences, the institute conducts research programs and provides advanced training in geodesy, aeronomy, oceanography, solid earth geophysics, geology, soils, geochemistry, underwater acoustics, and tsunami. The main laboratory of the institute is located at 2525 Correa Road on the campus. The institute also maintains a ship operations facility at Pier 18, Honolulu, and a seismographic observatory in upper Manoa Valley.

The **Hawaii Institute of Marine Biology**, established in 1948 with facilities on Coconut Island in Kaneohe Bay and at Kewalo Basin, encourages research in the marine biological sciences, including fisheries, by providing facilities and services for faculty members, graduate students and visiting scientists. Its research programs include studies in the ecology, physiology, behavior and systematics of marine animals and plants, pollution studies, biology, chemistry and pharmacology of toxic marine organisms, fundamental research in the interrelationship of organisms and their environment, and an applied resource development and exploitation research under the Sea Grant Program.

The **Industrial Relations Center**, established in 1948, seeks to promote understanding of industrial relations and manpower development problems, techniques and policies. Organized to facilitate University instruction in the disciplines and professions related to industrial relations, it also serves labor, management and the community as the link in a continuing dialogue, reporting on changes in the field to enlarge understanding so that the public good is enhanced. In this endeavor the center functions through several channels, including a library containing the basic information services, as well as current publications; reference service; conferences, lectures and group discussions; and training of advanced students. Research studies in basic industrial relations problems are published by the center, as well as a monthly *Newsletter*, a bimonthly *Selected Acquisitions List*, reprints, reading materials and bibliographies.

The **Institute for Astronomy** was founded in July 1967, to assume responsibility for the development of the University's research programs in astronomy. In cooperation with the department of physics and astronomy, with which certain of its staff share appointments, the institute provides graduate training on the Manoa Campus and at its observing facilities. The institute operates observatories on Mount Haleakala, Maui, for studies of the sun (especially the corona) and of the zodiacal light. On Mauna Kea, Hawaii, an observatory for planetary and stellar studies, equipped with an 88-inch and two 24-inch telescopes, has recently been completed. A space astronomy program has obtained high resolution ultraviolet spectrograms of the sun from rockets, and is planning work based on satellites and space probes. The office of the scientific staff, laboratories for



10

data reduction and instrument development, and shops for instrument construction and maintenance, are located on the mauka Manoa Campus.

The **Instructional Resources Service Center** is staffed by instructional and media specialists. Upon request they offer assistance and consultation to faculty in examination of instructional objectives, overall strategy planning, organization of instructional media, evaluation of media systems, and the necessary follow-up for effective development and implementation of programs.

The selection, location, production, evaluation and effective use of media are coordinated for faculty and staff by the center which has three major sections. *Instructional Systems* operates the closed circuit television system, twelve multi-media auditoria and Varsity Theatre. *Graphics* prepares and develops a wide range of graphic materials including transparencies for projection and diagrams, by using various processes such as diazo and photography. The *Media Lab* is used for demonstrations, media workshops and videotaping for instructional self-analysis. The lab also includes self-service facilities where equipment and materials are provided for faculty who wish to make their own transparencies and other instructional materials.

The **Laboratory of Sensory Sciences** performs basic research on all the sensory capabilities of man and other animals. Vision, hearing, taste, smell and the senses of the body are studied as well as their associated nerve reactions. In the laboratory are included the scientists, students and equipment in the disciplines of biophysics,

psychophysics, electrophysiology, neurology and behavior, all investigating in common, but from different viewpoints, the basic question of the nature of sensation. This interdisciplinary approach, plus the year-round availability of marine animals for study in Hawaii, makes the laboratory unique in the study of the sensory processes.

The **Land Study Bureau** is the center of land research for the University and the state of Hawaii. The bureau plans and conducts a dynamic program of basic and applied research, and publishes its findings, with the objective of achieving highest and best use of the lands of Hawaii. Research is interdisciplinary with a broad base in the physical and social sciences. The bureau participates in the teaching program of the University and provides data for and works cooperatively with students, faculty and staff (including the East-West Center) as they seek solutions to Hawaii's environmental, economic and social problems. The bureau also advises and participates in the technological and economic development of areas throughout the Pacific and Asia.

The **Legislative Reference Bureau**, created by the legislature in 1943 to aid in legislative and governmental problems, is situated at the state capitol, where it maintains a reference library. It provides the legislature, governor, departments, institutions and agencies of the state with bill-drafting services, information and reports.

The **Thomas Hale Hamilton Library**, located on the Mall, houses the main book and periodical collections of the University of Hawaii Library. Maximum utilization of the library's resources is the aim of the organizational plan which places humanities, social science, and science technology librarians near the reference materials and current periodicals of the respective broad subject area. Hamilton's openstacks contain approximately 650,000 volumes, including 13,000 currently received serial titles. Microform and the major research collections are located in Hamilton except those listed below which will remain in Sinclair Library until Phase II of Hamilton Library is completed. The four-story building, which provides space for 955 readers, has an open reading lanai on the top floor.

**Gregg M. Sinclair Library**, located at University Avenue and Campus Road, houses the Undergraduate Collection of 95,000 volumes as well as the Asia Collection, Government Documents, Rare Books, Archives, Hawaiian and Pacific Research Collections. As the undergraduate library, Sinclair has the Reserve Books (graduate and undergraduate), a browsing collection with lounge furniture, a reference collection, a collection of college catalogs, a collection of children's literature, a listening center and seats for 2,000 readers.

**Audio-Visual Services** located in Sinclair Library circulates the library's collections of approximately 1000 film titles, as well as filmstrips, media kits, phonodiscs, slides, tapes and transparencies. Portable equipment to utilize these resources is lent upon request. A-V Services also maintains decentralized pools of equipment conveniently located in various classroom buildings on campus.

Audio-Visual Services operates the **Listening Center** in Sinclair Library and upon request also provides such services as tape duplications and PA systems for special events.

The **Harold L. Lyon Arboretum** occupies 124 acres in upper Manoa Valley, about 2.5 miles from the Manoa campus. It was developed by the Hawaiian Sugar Planters' Association and presented to the University in 1953. Several hundred species of exotic trees and shrubs are established, inventoried and maintained, providing the University and scientific community with an unrivaled facility for research on tropical and subtropical plants.

The **Pacific and Asian Linguistics Institute** plans and conducts research on the languages of Asia, the Pacific Basin and the Americas, with special attention given to previously undescribed languages. The scope of the research includes the compilation of bilingual dictionaries, grammatical descriptions and pedagogical materials. Computer aids are used extensively for lexical storage and retrieval and for comparative linguistic purposes.

The **Pacific Biomedical Research Center** encourages investigations in the areas of subcellular biology, microbiology, cell structure and function, regulatory biology, genetics, behavioral sciences, epidemiology and other areas of medical research. Its building provides space; research equipment, such as electron microscopes; and research facilities, such as an animal colony, to faculty members, graduate students and visiting scientists. The center contains research laboratories for microbiology, physiology, biochemistry, biophysics, and psychology, in which it fosters and facilitates research projects of biomedical interest.

The **Pacific Urban Studies and Planning Program** is a multidisciplinary endeavor, located in the College of Arts and Sciences and guided by the participating academic departments and professional schools—architecture, economics, engineering, geography, political science, public health, social work and sociology. These departments and schools join with the program in offering graduate studies emphasizing planning and urban and regional development. The program sponsors and facilitates problem-oriented research on urban and planning problems, particularly those relevant to Hawaii, the Pacific Basin and Asia and participates in, coordinates with and supports related University efforts.

The **Population Genetics Laboratory** was established in 1968 to conduct research in human genetics, especially on peoples of the Pacific Basin. The CDC 3100 computer at the laboratory is used also by visiting investigators from other institutions. The laboratory has been designated by the World Health Organization as its International Reference Centre for Processing of Human Genetics Data.

The **Social Science Research Institute** facilitates the initiation of faculty research and develops and conducts programs primarily of an interdisciplinary nature in the social sciences and related fields. Particular emphasis is given to comparative studies, futuristic analysis, and quantitative methodology. The institute is developing

new programs in Hawaii Community Studies, Political Leadership, Automation and Society, Comparative Legislative Studies, and Multi-disciplinary Graduate Student Seminars. A program for the study of contemporary Korea is being assisted by the institute. A long-term study of cultural and mental health in Asia and the Pacific provides an opportunity for Asian and American scholars to participate in cooperative research.

The institute provides a variety of support services to social science faculty including computer consultation, manuscript typing, distribution of working papers and publications, information on social science research, and grant assistance.

The **Social Welfare Development and Research Center**, located in the School of Social Work provides interdisciplinary continuing education, consultation, and research in social welfare, with special emphasis on problems of juvenile delinquency and youth development. It utilizes an educational model which treats planning, training and program evaluation as a part of a single interrelated process. The focus is primarily on new and innovative approaches and techniques.

The **Speech and Hearing Clinic** is operated by the division of speech pathology and audiology of the School of Medicine. Diagnostic and therapeutic services in speech and hearing are provided for children, University students, and other adults by staff members and supervised student clinicians. A fee of \$5.00 per semester or part thereof is charged for non-University registrants.

The **Speech Communication Center** provides programs for students discovered to need special attention to improvement of their communication skills. Persons whose skills are evaluated as below criterion are trained in the center until these skills are re-evaluated as at or above criterion (usually after fewer than twenty clock hours of training). Within the space available, the center accepts, on a fee basis, persons not enrolled in the University. The center also engages in basic and applied research and provides training of researchers in speech-communication.

The **Survey Research Office** (formerly the Institutional Research Office) is responsible for providing survey technical facilities to campus researchers and for utilizing those facilities in generating and reporting data required for the planning, administration, and evaluation of the University system. Survey facilities include consultation on study design, questionnaire construction, sampling, data-collection, data-processing, analysis, and reporting. A data archive is maintained for purposes of secondary analysis. Faculty-course evaluations are offered to interested faculty members.

The **University of Hawaii Press** is the book publishing department of the University. It functions in much the same way as any other publishing house, although unlike commercial publishing firms, it operates on a non-profit basis and the emphasis is on scholarly publication.

The Press is a member of the Association of American University Presses and the Association of American Publishers. It publishes books of general interest as well as scholarly monographs, with particular emphasis on books dealing with Hawaii, the Pacific area, and the



Orient. It also publishes four scholarly journals: *Asian Perspectives*, *Oceanic Linguistics*, *Pacific Science*, and *Philosophy, East and West*.

Editorial control (final selection of manuscripts) is vested in a board made up of University of Hawaii faculty members appointed by the president. Faculty members are encouraged to submit booklength manuscripts to the director. Journal papers should be submitted to the respective editors.

The **Office of University Relations and Development** is responsible for the production of all official University publications, for publicity and public relations activities, and for the coordination of efforts to raise funds for the University from private sources.

The **Waikiki Aquarium** is a state-owned museum specializing in Hawaiian aquatic exhibits. It is located in Waikiki and is operated by the University of Hawaii as a place for the education, recreation and inspiration of Hawaii's residents and visitors.

The **Water Resources Research Center** plans and conducts research of both basic and practical nature related to Hawaii's water resources, assists and promotes instruction in water resources in several academic departments, and provides for training opportunities of engineers and scientists through research. Research is interdisciplinary with a broad base of physical sciences, technology and social sciences. It involves hydrology and hydraulic engineering, geology, geophysics and geochemistry, sanitary engineering and public health, climatology and soil physics, agricultural engineering and forestry, and socio-economic and legal aspects. The center operates research laboratories and field research facilities.

12

## INTERNATIONAL PROGRAMS

The international relations of the University are coordinated by the president. The All-University Advisory Council on the International Relations of the University of Hawaii provides for information exchange, cooperation and coordination among the units of the University. As necessary the Advisory Council provides reports and policy advice to the University community.

Currently more than 200 of the University's programs have an international dimension. The University of Hawaii ranks fourth nationally in number of foreign scholars and eleventh in foreign student enrollment.

The University also provides an academic house for the only nationally funded Center for Cultural and Technical Interchange Between East and West: the East-West Center, with institutes devoted to the study of communications, culture learning, food, population, and technology and development. In Hilo, the newly named Center for Cross-Cultural Training and Research is expanding on its prior function as a Peace Corps training center and now is available to train a variety of citizens for cross-cultural experiences, as well as conducting research in this field.

## TUITION AND FEES

*(Tuition and fees subject to change)*

Tuition and fees for graduate students are the same as for undergraduates.

### Application Fee\*

All applicants pay a \$10.00 application fee for each application filed.

### Tuition

Students registered for 12 or more credit hours in any semester pay \$85.00. Nonresidents pay \$340.00 per semester.

Students registered for fewer than 12 credits during the regular session pay \$9.00 per credit hour. Nonresidents pay \$30.00 per credit hour.

*College of Continuing Education and Summer Session.* Students registered in the College of Continuing Education and Summer Session pay \$20.00 per credit hour. Nonresidents pay \$30.00 per credit hour.

### Advance Tuition Deposit

New nonresident students pay \$90; all other students, including continuing and returning nonresidents, \$27. This deposit is nontransferable (applicable only for the semester for which the deposit is made) and nonrefundable (may not be refunded if the student fails to register for the semester for which the deposit is made).

### Fees

To be official, tuition and the general fee must be paid within 24 hours after the close of the final day of registration. Exceptions may be made by the treasury office only upon written permission of the Graduate Division Dean.

*General.* Full-time students pay a general fee of \$18.00 per semester. One-half time graduate assistants who, with special permission from the Graduate Dean, are permitted to register for 12 credits, including audit, must pay the general fee.

*Late registration.* There is a late registration fee of \$5.00.

*Graduation fee.* All recipients of advanced degrees are required to pay a graduation fee of \$5.00 during their last term.

*Thesis binding fee.* The fee is \$4.00 to cover the cost of binding two copies of the thesis, payable during the student's last term.

Payment for the graduation and thesis binding fees should be made at the treasury office.

\*This fee must accompany the application form. No action will be taken on an application until the fee is received by the Graduate Division. Checks or money orders must be made payable to the University of Hawaii. Do not send cash. For those who are applying from countries other than the U.S., payment must be made in international money order. This fee applies to applicants for admission toward a graduate degree program, and not to those who register for summer session only. The fee is not refundable, and does not carry credit toward tuition in the University.

*Course changes.* Each course change after initial registration costs \$2.00, unless the change is required by conditions beyond the control of the student. This charge is not made for withdrawal from the University.

### Refunds

Tuition and special course fees may be refunded to students who withdraw from courses, the percentage refunded to be in accordance with the following schedule:

80% during the first two weeks of instruction.

40% during the third and fourth weeks.

0% after the fourth week.

In no case is refund made for any part of the general fee, late registration fee, or fee for returned check.

## ASSISTANTSHIPS AND FELLOWSHIPS

*Graduate Assistantships.* The University offers a number of graduate assistantships to graduates of accredited institutions of higher learning who have satisfactory scholastic records, an adequate undergraduate background in the major field, and evidence of a high level of English proficiency. All applicants for graduate assistantships must be admitted as potential degree candidates to qualify for appointments. Graduate assistants serve as part-time teaching or technical assistants and carry a program of study usually limited to a maximum of nine hours a semester. The initial remuneration is \$3,708 payable in twelve monthly installments, and waiver of tuition and the general fee. Graduate assistants registering for twelve or more semester hours (including audit) must pay the \$18.00 general fee. They are not exempt from special course fees listed in the *General Catalog*. The period of service is from fall registration week through spring commencement. Applications should be addressed to the chairman of the appropriate department and be filed before February 1. Each application must be accompanied by three letters of recommendation from former professors or employers.

*Research Assistantships.* One-half time research assistantships are available in various fields in connection with research contracts or grants which are supervised by members of the faculty. Inquiries concerning these should be addressed to the chairman of the appropriate field of study.

*East-West Center Scholarships.* See p. 18 for details.

*Fellowships and Traineeships.* The Graduate Student Programs Office of the Graduate Division has available general information on fellowship competitions open to graduate students which are administered by outside foundations or agencies. For application purposes, it is important to distinguish between (1) those awards made directly by the sponsoring agency to individual students, and (2) those awards made by the sponsoring agency to an institution to be awarded, in turn, to students for study at that specific institution.

Awards in the first category are generally awarded by national organizations and allow students to choose their institution of affiliation. Applications are submitted by students to the sponsor, usually in early fall preceding the year graduate study is to begin. Examples listed here with their addresses include:

National Science Foundation

National Research Council

2101 Constitution Avenue

Washington, D.C. 20418

HUD Urban Studies Fellowships

U.S. Department of Housing and Urban

Development

Washington, D.C. 20410

Law Enforcement Predoctoral Fellowships

National Institute of Law Enforcement and Criminal  
Justice

633 Indiana, N.W.

Washington, D.C. 20530

Awards in the second category, which vary in source from federal to local, include NDEA IV Predoctoral Fellowships, NDFL Fellowships in Asian Studies, and EPDA, Part E Fellowships for Prospective Community College Teachers, as well as a large number of smaller programs. At the University of Hawaii nominations for these awards are made by the departments that are eligible. Students are urged to exercise their initiative to explore the various possibilities. In any case, *the first place to inquire is your major department.*

13

## FINANCIAL AIDS

The University of Hawaii subscribes to the College Scholarship Service (CSS) system of financial need analysis and utilizes the CSS inventory of forms. Students who wish to be considered for any of the types of financial assistance outlined below should submit the appropriate CSS form to the nearest address indicated on the form itself. Acceptable CSS forms are the Graduate and Professional Student's Financial Statement (preferred); the Parents' Confidential Statement for students dependent upon their parents for educational costs; the Student's Confidential Statement for students completely independent of parental support. Applications should be submitted so as to arrive at the appropriate CSS office by March 1 in order to be considered for the following academic year. The CSS forms may be secured from most high schools and community colleges or from the Financial Aids Office, University of Hawaii.

The University participates in the National Defense Student Loan, the College Work-Study, the Health Profession Loan/Scholarship and the Federally Insured/Guaranteed Loan programs. Applicants for the latter program who are not residents of Hawaii should contact the State Guarantee Agency in the state of legal residence for details. In addition, the State Higher Education Loan program is available for residents of Hawaii who are full-time students.

Another form of financial aid available to students is employment. The Financial Aids Office performs the functions of an employment agency for on-campus student jobs and serves as an information center for off-campus employment opportunities.

## LIVING ACCOMMODATIONS AND EXPENSES

The student must be fully aware of several problem areas in making plans to attend the University of Hawaii.

First, finding suitable housing will be a major problem unless handled in advance of academic registration. Acceptance to the University does NOT assure one of housing. Housing in this community is scarce, difficult to find and expensive.

Second, there is only a limited number of residence hall facilities on campus. Almost all of these assignments go to state of Hawaii residents since priority is given to these students. There are no facilities on campus for married students. The Student Housing Office keeps listings of available off-campus spaces but most of these are small units scattered throughout Honolulu. These units are limited and reserved usually a month or more in advance of a term. Remaining facilities are usually farther away from campus and very expensive.

The student is cautioned to be prepared to make temporary housing arrangements in hotels or other quarters, if possible in advance, and to bear in mind that rental rates can quickly use up personal funds. He must utilize all possible avenues of searching for housing including newspapers, rental agencies, personal or professional contacts in the community or other sources.

Inquiries concerning student housing should be directed to the Student Housing Office, Johnson Hall-A, 2555 Dole Street, Honolulu, Hawaii 96822.

Gateway House, the only hall available to graduate students, has double-room accommodations for 104 women and 104 men in two separate towers. Both men and women students share common lounge, dining, and recreational facilities on the first floor.

Application-contracts must be accompanied by a \$25 deposit before consideration for space reservation can be made. Room and board fee is \$436 per semester.

### Off-Campus Housing

The Student Housing Office offers a free central listing service and maintains listings of rooms in private homes, a few apartments, and room and board jobs. However, these listings are very limited and quickly exhausted. Moreover, these off-campus landlords must be handled directly by the student. Because of the rapid turnover, the names of landlords cannot be sent through the mail. Spaces which are available to be shared with other students are listed in the office for convenience but names of individual students or roommate requests are not listed. The rush for housing usually starts about

three weeks prior to beginning of classes. There is no place on campus to which luggage or mail may be forwarded ahead of arrival.

### Food Services

In addition to the Gateway House cafeteria, dining facilities on campus include:

*Hemenway Hall Cafeteria.* Plate lunches, sandwiches and snacks are served.

*East-West Center Cafeteria.* A complete food service in Jefferson Hall, including a cafeteria, a snack bar and private dining rooms.

A *snack bar* in the northeast section of the campus.

Food vending machines are also located throughout the campus providing 24-hour service.

### Expenses

Minimum expenses per academic year are estimated to be approximately \$2,790 for students living in off-campus housing; \$2,345 for students living at a University residence hall; \$1,725 for a student living at home. These estimates do not include the costs related to dependents, transportation for out-of-state students, extensive medical/dental care or the tuition differential for nonresident students. They do include costs for board, room, resident tuition, books, supplies, fees other than those related to curricula, clothing, recreation and personal/miscellaneous.

## STUDENT SERVICES

### Student Health Service

The Student Health Service is set up to assist the student in protecting his health. Facilities are housed in the Student Health Service building located at 1710 East-West Road and include both an out-patient clinic and an infirmary. Most of the common everyday illnesses that occur in a student can be cared for through this service, and if simple bed care is indicated, the student may be admitted to the infirmary. The clinic hours run from 8:00 a.m. to 11:30 a.m. and 12:30 p.m. to 4:00 p.m., Monday through Friday and 9:00 a.m. to 11:00 a.m. on Saturdays. A nurse is available during off-duty hours for emergency services only.

Although the service is free, students must pay for drugs prescribed and there is an infirmary charge at \$4.00 a day. The health care services are limited; supplemental health and accident insurance is therefore essential to provide the student with medical care beyond the scope of this service. For information about the ASUH sponsored health insurance plan, consult the Bureau of Student Activities or the Student Health Service.

The University requires that all newly registering daytime students undergo a complete medical examination, and the results of this evaluation must be submitted to the Student Health Service on the University of Hawaii Health Form for approval before medical clearance can

be granted and registration completed. Medical services will be denied all students who do not comply with this requirement. Students who are returning to the University of Hawaii to continue their education after dropping out of the University for more than four years must re-submit this health form for approval. Payment for these preadmission medical examinations is the personal responsibility of the student.

Tuberculosis remains a distinct hazard for all students. All students must have a TB skin test or chest x-ray performed six months prior to enrollment. Positive reactors of the skin test must follow up with a chest x-ray taken immediately and annually thereafter.

All foreign students will be skin tested upon arrival on campus. Positive reactors will be required to have a chest x-ray taken in Hawaii. A repeat chest x-ray is also required by the state of Hawaii of all students applying for visa renewals.

Residents of University housing must obtain a medical clearance from the Student Health Service before they are permitted to reside in the residence halls. Students afflicted with any contagious illness must leave the residence hall for the duration of the contagious period of the illness.

#### **Counseling and Testing Center**

The Counseling and Testing Center's staff consists of professionally trained psychologists, psychiatrists, psychiatric social workers, psychometrists and interns, who, as a team, function on the campus in the areas of student service, graduate training and academic research. Educational, vocational and personal counseling is available to students. Various aptitude, interest and other psychological tests are often used as aids in the counseling process. The Center also maintains an educational and vocational library.

#### **Parking and Traffic**

Students are expected to familiarize themselves with the University's parking and traffic rules and regulations established by the board of regents. These regulations and special instructions may be obtained at the Office of University Relations in Bachman Hall, at the Traffic Desk in the Auxiliary Services building, and also during registration periods at the lanai area of the swimming pool located in the quarry. *Ignorance of these rules and regulations will not excuse a student from the payment of fines for violations.*

*Parking permits* are sold in the lanai of the swimming pool (quarry) during registration periods, and at the Traffic Desk in the Auxiliary Services building throughout the year.

#### **International Student Office**

The International Student Office serves both foreign and American students. It helps those from other countries attending the University, with immigration requirements, financial problems, living arrangements and other University and community matters. Special orientation programs are held at the beginning of each

semester; foreign students admitted to the University are notified in advance and urged to arrive in time to attend them.

The office, located in Webster Hall 101, advises American students who seek opportunities for overseas study, service and travel, and who wish to engage in international student activities while at the University of Hawaii.

Non-U.S. citizens who are graduates of a university and are applying for admission to the University of Hawaii should write to: Graduate Division Admissions Office, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822.

#### **Rights and Freedoms of Foreign Students**

The University of Hawaii, like all state universities, embraces those aspects of academic freedom which guarantee the freedom to teach and the freedom to learn. Free inquiry and free expression for both students and faculty are indispensable and inseparable. Students, whether from the United States or from foreign countries, as members of the academic community, are encouraged to develop a capacity for critical judgment and to engage in sustained and independent search for truth.

Students from foreign countries, as full participants in the educational process at the University of Hawaii, have the right to pursue formal knowledge, verbal or written, in whatever directions and with whatever legitimately appropriate associations as are necessary, without fear of reprisal.

For its part, the University of Hawaii guarantees all students the freedom of silence. No student is required to engage in research or any topic or to make statements of any kind, unless it is his wish to do so.

The University of Hawaii would be most concerned if any government placed its own nationals in jeopardy for engaging in normal academic studies on its campus; it urges other governments to accept the concepts of academic freedom prevalent here if they intend for their nationals to study at this institution.

#### **ENGLISH LANGUAGE INSTITUTE**

The University of Hawaii established the English Language Institute (ELI) as its agency for assuring that the English proficiency of its foreign students is adequate for University course work. ELI responsibilities include testing and evaluating the English competency of all new foreign students, and providing suitable instruction for those students whose English fails to meet standards determined by the University to be sufficient for the pursuit of full-time studies..

**Evaluation and Testing.** Upon arrival at the University, all foreign students are referred to ELI for evaluation of their English proficiency, regardless of whether they have previously taken an English examination as part of their application for admission to the University. Registration for University course work is not permitted until the ELI completes its evaluation. Excused from

testing are the following classes of foreign students:

- (1) those who hold a degree from an accredited college or university in the United States, Australia, Canada, England, or New Zealand;
- (2) those with TOEFL scores of 650 or higher.

**Assignment to ELI Courses.** All foreign students enrolled in ELI courses are assigned to a program of ELI instruction designed to serve individual needs. Courses are offered at basic, intermediate, and advanced levels in oral fluency, structure, reading, and writing. ELI courses cannot be taken in auditor status.

**Waivers.** Graduate students may have any or all of their recommended ELI courses waived, at the discretion of their academic department. A signed waiver form must be submitted to the ELI office in Moore Hall, Room 570.

**Relationship of ELI Assignments to Other Course Work.** Students assigned to ELI training take a reduced academic load, in order to devote sufficient attention to gaining satisfactory competence in English. Students required to take relatively large amounts of ELI work during their first and second semesters must anticipate slower progress toward their academic goals. This is an especially important consideration, and should be recognized by all foreign students required to take courses in the ELI.

**Eligibility for Registration in ELI.** Registration for ELI courses in the fall and spring semesters is limited to students who have been officially admitted to the University. Students who apply to the Graduate Division of the University for the sole purpose of entering ELI in order to improve their English will not be accepted. Such students may be eligible for H.E.L.P. (Hawaii English Language Program); for information about which, write to H.E.L.P., College of Continuing Education and Community Service, University of Hawaii, 2500 Dole Street, Honolulu, Hawaii, 96822.

16

## EAST-WEST CENTER

The East-West Center—formally known as The Center for Cultural and Technical Interchange Between East and West—was established by the U.S. Congress in 1960. The goal of the Center, as mandated by Congress, which provides annual appropriations for its support, is to promote better understanding and relations among the peoples of Asia, the Pacific area and the United States through cooperative study, training and research.

In cooperation with Asian/Pacific countries and the University of Hawaii, the Center aims at the free interchange of information, ideas and beliefs in cultural and technological fields.

Each year about 1,000 students, fellows and technical training participants from more than 35 countries and territories come to the Center under federal scholarships and grants, supplemented in some fields by contributions from foreign governments and private foundations. Academic instruction is provided, and degrees are

awarded to students in degree programs, by the University of Hawaii under a grant-in-aid agreement with the Department of State for operation of the Center. Non-degree programs and projects involving education, research and technological training are conducted by the Center in cooperation with the University, U.S. mainland and Asian/Pacific institutions, federal and state agencies, and private organizations.

Experience at the Center in its first decade has led to the conviction that deeper cultural interchange and mutual respect is fostered when men and women of diverse nationalities study and work together on seeking and testing alternative solutions to common problems affecting the quality of life. Accordingly, academic study, research and training is coordinated in problem-oriented institutes which carry out most of the Center's programs.

## Problem-Oriented Programs

**East-West Communication Institute.** Communication problems involved in social and economic change provide the focus for study, research and training in the institute. Seminars, workshops and special activities provide the more generalized students and scholars in the social sciences and humanities with a specialization in the communications process. Scholarships for M.A. and Ph.D. studies are awarded through the Institute for study at the University in such fields as Asian studies, American studies, art, economics, educational communications, educational psychology, English, history, information sciences, library science, linguistics, political science, psychology, sociology, speech-communication and related disciplines. Institute students and fellows also participate in nondegree training programs in such fields as population information and agricultural communication. The Institute, under a grant from the Agency for International Development, is carrying out a three-year study of information, education and communication support for family and population planning programs in developing countries. Other resource material on the use of communication in social and economic development is collected for research purposes at the Institute, which also issues a periodic Newsletter. Jefferson Fellowships are awarded by the Institute annually to mid-career Asian and Pacific journalists in print and broadcast media for a semester of non-credit study at the University of Hawaii. The 1971-72 Jefferson Fellowships are scheduled for the spring semester, January-May 1972, for editors, writers and broadcasters with particular interest and experience in developmental communication.

**East-West Culture Learning Institute.** The Institute is concerned with study and research on how another culture can be learned without losing the identity of one's own culture. Two major elements, the Culture Learning Program and the Language Learning Improvement Program, are designed to foster the Center's goals of interchange and mutual understanding by coordinated programs of study, research and training. Included in Institute programs is the learning of other cultures by different means such as study of language, literature,

arts, music, drama, history and philosophy. In addition to classroom work, advanced graduate students may receive practical research training experience as interns in the Institute. Institute programs provide Culture Learning scholarships for M.A. and Ph.D. study in such University departments as Asian studies, American studies, anthropology, art, drama and theatre, educational administration, educational foundations, educational psychology, geography, history, music, Pacific Islands studies, philosophy, political science, psychology, public health, social work and sociology. Language Learning Improvement scholarships are awarded for University study in such fields as Asian/Pacific languages, education, English, linguistics, Teaching of English as a Second Language (TESL), psycholinguistics and speech-communication. The Institute also provides nondegree training and aims at the development of instructional material and new curricula based on research.

**East-West Food Institute.** The Institute deals with an integrated interpretation of the multifaceted human technical, and economic concerns with food. Research and training are aimed at contributing toward the solution or relief of problems related to food which range from policy making in national capitals to cultural values, and involve proper distribution and nutrition as well as production. Scholarships are awarded through the Institute for M.A. and Ph.D. study at the University in a wide range of disciplines in the humanities and social and natural sciences as well as in fields directly associated with agriculture, fisheries, nutrition, food technology and economic analysis. Advanced degree students affiliated with the Institute are expected to take at least one course in the tropical application of a food-related field outside the primary subject-matter area of interest; take a course in "Agriculture and Rural Development Administration"; and participate in one semester of the Institute's seminar on "The Food Systems of Asia and the Pacific." Outstanding scholars and authorities are invited in small numbers as senior fellows and fellows to undertake research, discussion, consultation, teaching, program development and writing. Fellowship research activity in 1971-72 is directed toward such fields as multiple cropping, agricultural diversification program technique, agricultural finance and capital formation, resource inventory through photo interpretation, agribusiness, agriculture administration, weed biology and control, soil and water management and the role of foreign capital in development. Aquiculture, nutrition, the social and political impact of technical change, and regional analysis are also among areas of interest.

**East-West Population Institute.** The Institute, established within the Center in 1969, offers scholarships to qualified candidates for advanced degrees in various fields such as anthropology, economics, geography, sociology and public health, who also wish to specialize in population studies. The objective of the degree program is to enable students to acquire a thorough understanding of demographic structures and processes—fertility, mortality and migration—and their causes

and consequences. The program emphasizes the social and economic aspects of population trends and examines the rational and the ways by which societies attempt to modify these trends. Special attention is paid to training in techniques of demographic analysis appropriate for deficient and erroneous data. The Institute's geographic focus is the Asian and Pacific area, reflecting Hawaii's unique position at the crossroads of the Pacific and utilizing the University's extensive research and library facilities in Asian and Pacific studies. The Institute is active in population research with an emphasis on Asian and Pacific populations. Under the supervision of faculty members who hold joint appointments with the East-West Center while also offering population studies courses in various University units, and under the supervision of other Center staff in population, graduate students have opportunities to participate in research projects conducted at the Institute. For more advanced students, particularly at the Ph.D. level, field work outside Hawaii is arranged and supported by the Institute on a team or an individual basis. The Institute also conducts a variety of short-term, nondegree training programs, maintains a specialized collection of books and reference materials, and engages in various research- and service-related activities.

**East-West Technology and Development Institute.** Programs of the Institute are designed to increase the knowledge and capabilities of scholars, students and practitioners in the areas of science and technology, and in development policy, planning and administration. Finding solutions to problems posed by rapid technological change and development is of utmost concern to countries of both East and West and research programs emphasize the generation of new ideas based on Asian and Pacific developmental experiences. Adaptation of new technologies and developmental processes is not seen as a unilateral function from the East-West Center to other institutions, but rather in the form of student, faculty, and staff exchanges, and collaborative programs. Academic fields in which the Institute awards scholarships and fellowships including engineering, ocean and geosciences, economics, political science, sociology, health, education, social work, business and public administration, urban and regional planning. Degree-seeking students are expected to participate in team projects with Institute staff and fellows in research and training to prepare them for their future roles in planning and managing developmental change. Promising areas of scientific and technological research include "technological leapfrogging" and applied "intermediate" technology. "Technological leapfrogging" bypasses steps in the development process by introducing new ideas and new technologies. "Intermediate" technology modifies and adapts technological advances to meet specific needs of individual countries.

One major Institute development program is micro-planning for the areas of health, tourism, education, manpower, housing and small industries. Programs in the development policy field include agrarian reform, tax and fiscal policy, and regional cooperation and in-

tegration. Development administration programs include new enterprises, project management and administrative reform.

### Open Grants

The East-West Center also awards scholarships, fellowships and grants embracing projects and study opportunities not directly associated with its problem-oriented programs. Open Grants provide scope for educational and research innovation in areas of mutual East-West concern and for planning on new Center programs.

Planning involving Center staff, students, fellows and University faculty began in 1970-71 to determine how best to provide a programmatic focus for contributions from various fields in the humanities and the arts.

### Scholarships and Grants

Scholarships for study at the University of Hawaii, mainly at the graduate level, generally include round-trip fare from the student's home, housing in the Center residence halls, tuition and books, medical insurance and a modest stipend for food and incidental expenses. If the student meets Center requirements, a grant may provide field education on the United States mainland for Asian/Pacific students and in Asia or the Pacific for American students.

Candidates for degrees must meet the academic standards of the University of Hawaii and at the same time must give evidence of interest and ability in contributing to intercultural communication. Scholarships are initially awarded for 17 or 19 months with provisions for extension to those who qualify. All degree program scholarships for Americans are at the graduate level. Some undergraduate scholarships are awarded to those students who come from countries where there are a limited number of higher educational institutions.

**Senior Fellows and Fellows.** Grants, usually ranging from four to ten months in residence, are made to experienced, professional level persons—such as professors, government administrators and authors—for participation in Center programs and seminars and for individual research and writing.

**Training Grants.** Housing, living expenses and training costs are provided, sometimes in cooperation with other agencies. The cost of international transportation is usually paid by governments or agencies sponsoring participants. Training projects usually run from three to twelve months.

**Language Requirements.** Because the medium of instruction at the University of Hawaii is English, student grantees from Asia and the Pacific area are tested for English proficiency by the University's English Language Institute. Those requiring extra help are assigned to full-time or part-time training in English until they are ready for a full academic program. American students are required to complete at least two years of Asian or Pacific language study before the end of their grants.

**Intercultural Activities.** To help promote cultural interchange, academic scholarships are awarded to approximately two Asian/Pacific students for each American at the Center. Center-wide activities embracing all participants—students, senior fellows and fellows and technical trainees—are designed to develop intercultural understanding recognized as one of the basic goals of the Center.

### Supporting Services

The East-West Center Press issues new publications originating in the Center, at the University of Hawaii and other East-West institutions. It has developed an import and export book program to promote cultural and technical interchange.

The Conferences and Seminars Office supports international meetings of senior-level experts dealing with problems of mutual concern to East and West, with emphasis on those involving Center programs.

The Office of Participant Services administers conferences and seminars, coordinates intercultural activities and deals with admissions, counseling and liaison with former participants. It is responsible for Community Relations, primarily through the Friends of the East-West Center, a voluntary organization of Hawaii residents which helps Center participants join in community activities. The Office of Public Affairs disseminates information on Center programs and activities. The Office of Administrative Services supports all Center participants and programs.

### General Information

The East-West Center complex on the Manoa campus of the University includes Thomas Jefferson Hall, the administration building which houses 50 offices, a lounge, cafeteria, conference rooms and the exhibition gallery; Abraham Lincoln Hall, which houses the problem-oriented Institutes and the East-West Center Press; John F. Kennedy Hall, a theater-auditorium; Hale Manoa and Hale Kuahine, residence halls for men and women participants. East-West Center funds were used for the construction of Edmondson Hall and a wing of Moore Hall, University classroom buildings. A Japanese garden is adjacent to the administration building and a traditionally-styled Thai pavilion, dedicated by King Bhumibol Adulyadej in 1967, lies between Jefferson and Lincoln Halls.

The Chancellor of the East-West Center, through a grant-in-aid agreement which channels federal funds to the University, is responsible to the Board of Regents through the President of the University. The National Review Board, appointed by the U.S. Secretary of State and headed by the Governor of Hawaii, represents the national interest in the Center and advises the Secretary of State.

Further information concerning scholarships and grants may be obtained by writing to the Office of Admissions, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.



# Academic Information

## ADMISSION

**Deadlines.** Applications for admission to the Graduate Division, transcripts, test scores, and other supporting documents must be postmarked no later than *March 1* for the fall semester, *September 1* for the spring semester.

**Application.\*** Students with baccalaureate degrees from accredited United States institutions of higher learning or, in the case of foreign students, baccalaureate degrees fully equivalent to the bachelor's degree granted by an American university, may be admitted to the Graduate Division, subject to the following qualifications: (1) that the standards of the degree in question are equivalent in both the distribution of academic subject matter and in scholarship achievement requirements to those maintained at the University of Hawaii; and (2) that the student can be accommodated in the field in which he wishes to study.

The Dean of the Graduate Division will deny admission if the applicant's record of scholarship is not sufficiently distinguished, or if his undergraduate program is inadequate for advanced academic or professional study. These provisions affect all applicants whether from colleges or schools in the United States or elsewhere.

Notification of acceptance or rejection is sent to each applicant as soon as possible after a decision is reached on his application. Applicants are warned not to make definite arrangements for attending the University until they have received a formal notice of acceptance from the Graduate Division.

\*Applicants to the Graduate School of Library Studies, School of Social Work, School of Public Health, and School of Medicine should apply directly to the dean of the school concerned.

Students applying for admission must submit the following:

### Graduates of American Universities:

*Classified students:*

1. Application form.
2. Transcripts (two complete sets) from each institution attended.
3. \$10 application fee.
4. Application fee form (enclosed with application beginning June 15, 1971).
5. Residence information form (for tuition purposes).
6. Records of examinations (GRE, MAT, etc.) as required by certain fields (see special requirements under field listings).
7. Letters of recommendation as required by certain fields.

### Graduates of Foreign Universities (non-Americans):

*Classified students:*

1. Application form.
2. Transcripts (two official copies) from each institution attended.
3. \$10 application fee.
4. Application fee form (enclosed with application beginning June 15, 1971).
5. Residence Information form (for tuition purposes).
6. Records of examinations (GRE, MAT, ATGSB, etc.) as required by departments. (See special requirements under field listings.)
7. Letters of recommendation as required by certain fields.
8. Results of Test of English as a Foreign Language.

Note: Foreign students are not accepted as unclassified students.



*Test of English as a Foreign Language.\** All applicants from foreign countries where English is not the usual means of communication are required to take the *Test of English as a Foreign Language* (TOEFL). Applications for admission will *not* be processed until the Graduate Division has received the TOEFL results, which are necessary in order to enable the admissions officer to evaluate the student's English proficiency in terms of his probable ability to carry effective graduate-level studies. TOEFL is administered only four times each year—in January, March, June, and October. Applicants should plan to take TOEFL at the following times:

For admission in:	Take the test the preceding:
September	October or January
January	March or June

Completed registration forms to take TOEFL must be in the office of the Educational Testing Service (ETS) at least *one month* prior to the date of the examination. The *TOEFL Bulletin of Information* and Registration Form can be obtained in a number of cities outside the United States. They often are available at one of the following: American embassies and consulates, offices of the United States Information Service (USIS), United States educational commissions and foundations abroad, and binational centers. In addition, several private organizations distribute TOEFL bulletins, among them (1) the Institute for International Education (IIE) in Nairobi, Kenya; Kowloon, Hong Kong; Paris, France; and Lima, Peru, (2) the African-American Institute in Dar es Salaam, Tanzania; and Lagos, Nigeria, (3) the American Friends of the Middle East in Tehran, Iran; Amman, Jordan; Beirut, Lebanon; Tangier, Morocco; and Cairo, Egypt, (4) the American-Korean Foundation in Seoul, Korea, and (5) the Bureau of Educational Research at Ewing Christian College, Allahabad, U.P. India.

Students who cannot obtain a TOEFL bulletin and registration form locally should write well in advance for them to: Test of English as a Foreign Language, Box 899, Princeton, New Jersey 08540, U.S.A. Students residing in Taiwan must apply to: Language Center, 2-1 Hsu-chow Road, Taipei, Taiwan, for the special Taiwan editions of TOEFL publications. Please do not write to the University of Hawaii for information on TOEFL.

### SUMMER SESSION

Students applying for admission to the summer session should apply to: Director of Admissions and Records, University of Hawaii, 2444 Dole St., Honolulu, Hawaii 96822. Applications for advanced degree programs are accepted for the fall and spring semesters only. Admission to summer session courses does not imply or guarantee eventual admission to the Graduate Division. However, appropriate credits from summer session courses are countable toward an advanced degree at the recommendation of the fields of study involved.

\*See p. 15 for information relating to the University's English Language Institute, and its role in testing and evaluating the English proficiency of foreign students.

### ENTRANCE EXAMINATIONS

As a service to in-state students, application forms for the GRE, ATGSB, and MAT are usually available at the Counseling and Testing Center, 1615 East-West Road. All out-of-state students must write to the address designated below.

**Graduate Record Examination (GRE).** The GRE is required for admission in a number of fields of study. In some fields it is recommended but not required. For requirements of the individual graduate fields of study, consult the relevant field of study descriptions in this catalog. Students taking the test must apply at least one month prior to the examination date. Applicants may write directly to Graduate Record Examinations, Educational Testing Service, 1947 Center Street, Berkeley, California 94704, or Box 955, Princeton, New Jersey 08540. Test dates, test fees and registration deadlines are posted on graduate school bulletin boards on all university campuses in the U.S. The GRE is administered six times a year: in January, February (U.S. only), April, July, October and December. ETS should be directed to forward the test results directly to the department to which you are applying for admission.

**Admission Test for Graduate Study in Business (ATGSB).** Students must apply to ETS by writing directly to Admission Test for Graduate Study in Business, Educational Testing Service, Box 966, Princeton, New Jersey 08540, at least one month prior to the date of examination. The ATGSB is usually administered in November, February, April, June and August of each year at a cost of \$10.00.

**Miller Analogies Test (MAT).** The test takes one hour. A fee of \$3.00 is charged to University of Hawaii students, and \$5.00 to non-students. In-state students who are required to take the MAT should contact the Counseling and Testing Center, 1615 East-West Road, for test dates, registration deadlines and test fees. Mainland U.S. students should contact a college or university in their area to arrange for the testing. Foreign students may write to The Psychological Corporation, 304 East 45th Street, New York, New York 10017.

### CLASSIFICATION OF STUDENTS

Graduate students (graduates of this University or of other institutions of approved standing) who have been admitted to the University of Hawaii Graduate Division are designated as *classified* (regular, probational, special) students.

*Regular* students are those who have been accepted by the Graduate Division and in their respective fields of study as potential candidates to pursue programs of study leading to advanced degrees.

*Probational* students are those who have been admitted probationally by the Graduate Division and in their respective fields of study as potential candidates to pursue programs leading to advanced degrees.

*Special* students are those who have been admitted to special sponsored nondegree training programs or certificate programs.

## UNCLASSIFIED STUDENTS

Because of limited space and facilities, out-of-state graduate students are not accepted as unclassified graduates.

To be considered for admission as a classified graduate student, the applicant must have earned a *B* average (3.0 grade-point ratio) for *all* post-baccalaureate courses as well as for all *graduate* courses (courses numbered 600 and above) completed while in unclassified status at the University of Hawaii as well as at other institutions.

Computation of the grade-point average after admission to the Graduate Division (a *B* average is required for continued registration and graduation) will include grades in courses completed while in unclassified status which are applied toward fulfilling requirements for an advanced degree.

No more than 12 units of course credit earned while in unclassified status at the University of Hawaii may be applied toward fulfillment of advanced degree requirements by students who registered as unclassified graduate students in the College of Continuing Education for the first time in Fall 1969 or thereafter.

## REGISTRATION AND CREDITS

**Social Security Numbers.** Students are required to present social security cards at registration, since the University uses these numbers in its records.

**Certification of Degree.** Students whose bachelor's and/or master's degrees were incomplete at the time they filed applications for admission must submit to the Graduate Division two official copies of transcripts certifying completion of their degrees within 60 days upon registration in the first semester of enrollment. Registration will be cancelled for those who fail to meet this requirement.

**Course Loads.** Sixteen credit hours in a semester and seven in a six-week summer session are considered a maximum course load and may be exceeded only with the approval of the Dean. The minimum full-time load for graduate students is as follows:

8 credits, including 2 or more graduate courses (courses numbered 600 and above)

9 credits, including 1 graduate course

12 credits, undergraduate courses exclusively

A doctoral candidate, however, carrying fewer than 8 credits in Thesis 800 may be certified by his adviser as carrying a full load. For graduate teaching assistants, the minimum full-time load is 6 credits. Because their duties ordinarily require 20 hours per week, they are restricted to 9 credit hours (including thesis research 800). Graduate assistants registering with special permission for twelve semester hours (including audit) must pay the general fee (\$18.00).

**Late Registration.** With written approval from the dean of his college, a student may register for credit (initial or as a result of program changes) only during and not later than the first three class days following regular registration. See Calendar, "Last day of registration for credit."

Registration to audit courses is permitted at any time, but auditors may not change to credit status after the above late registration period.

**Variable Credit Courses.** The number of credits obtainable in most courses is stated in this catalog and in the schedule of courses available shortly before registration. However, certain courses, designated by "hours arranged," offer variable credit. Students in these courses usually carry on individual work. The number of credits for which a student enrolls and will earn in such a course must be approved by the instructor at the time of registration. Students register for a definite number of credits and may earn no more or less than the stated number without the college dean's approval.

**Course Changes.** Students wishing to change a course or courses must follow the procedures given for withdrawing from a course (see below) and for late registration (see above). Forms are available in self-service racks in the Graduate Division hallway.

**Withdrawal from Courses.** To withdraw from a course, a student must have the signature of the instructor on a form available in self-service racks in the Graduate Division hallway. The student must then obtain approval from his academic adviser and the Graduate Division and turn in the form, along with a \$2 fee, to the Treasury Office in Bachman Hall.

A student may withdraw from a course up to the last four weeks of the semester; he will receive a grade of *W* (withdrawal, not failing). After the last date for withdrawals, a student may receive a grade of *W* if (and *only* if) he completely withdraws from the University with the approval of the Graduate Division.

If a student ceases to attend classes without officially withdrawing prior to the last four weeks of class, the instructor may award any one of the following final grades: *A*, *B*, *C*, *D*, *F*, or *I*. An instructor will award an *I* on the basis of the feasibility of the student's making up the work within the prescribed time limit. If an *I* (incomplete) is awarded, the instructor must also award an alternate grade to be recorded on the student's record if he does not undertake the work necessary to remove the *I*. This alternate grade may be any one of the following: *A*, *B*, *C*, *D*, *F*, or, if the course was taken under Credit/No-Credit, *CR* or *NC*.

Refunds for withdrawals from courses are noted under "Tuition and Fees—Refunds." Students seeking tuition refunds for withdrawals from courses should go to the Treasury Office in Bachman Hall immediately after the withdrawal form has been completed and signed, taking the form with them.

**Denial of Registration.** The Dean of the Graduate Division will deny further registration to any student whose work is below the required level.

**Graduate Credit for Seniors.** Seniors at the University of Hawaii may earn credit toward an advanced degree for some courses completed during their last semester as undergraduates provided (1) that the courses taken are in excess of the requirement for the bachelor's degree and (2) that such courses may be used to fulfill requirements in the major field. To obtain such credit

requires written approval of the dean of the appropriate undergraduate college and the Graduate Division when registering for the course.

**Credit by Examination.** Graduate students may obtain credit by examination in courses numbered 300-499 with the approval of the program adviser of program committee, the instructor concerned, and the Dean of the Graduate Division, subject to the general University regulations and procedures, except that there shall be no limit on the number of such examinations which a graduate student may take during any one semester. Credit may not be obtained by examination in courses numbered 600 or above.

**Correspondence Course Credits.** No graduate credit is allowed for correspondence courses.

**Undergraduate Deficiencies.** Under no circumstances are courses in directed research to be used to make up undergraduate deficiencies.

## COURSE NUMBERS

Courses numbered 600-799 are intended primarily for graduate students. Courses numbered 300-499 are upper-division undergraduate courses which may be used to fulfill advanced degree requirements.

Courses numbered 500-599 are not applicable toward advanced degrees. These numbers are used to designate special institute, in-service training, study tour, and refresher courses.

## CREDITS, GRADES, AND EXAMINATIONS

Work accomplished by students is usually recognized in terms of credits, grades, grade points, and grade-point ratios. Grade reports are given out at the end of each term.

**Credits.** A credit (also called a semester hour or a credit hour) is given to a student for work satisfactorily accomplished during three hours a week spent in the preparation and recitation of assignments in a course, or in the field or laboratory. The normal division of time in nonlaboratory courses is one hour in the classroom and two hours in preparatory work. Thus, a three-credit course signifies that the class usually meets three hours a week and that the student is expected to spend six hours in preparation of assignments.

**Grades.** Grades given in all courses are *A, B, C, D, F, CR, NC, W, and I*, except for 800 (thesis research) in which the grade of *S* (satisfactory) is given upon acceptance of the thesis. Failure to make satisfactory progress on a thesis does not entitle a student to refund of tuition fees. The lowest passing grade is *D* but only grades of *A, B, and C*, may be used to fulfill requirements for advanced degrees.

An *I* is given to a student who has failed to complete a small but important part of a semester's work before the semester grades are determined, if the instructor believes that the failure was caused by conditions beyond the student's control and not by carelessness and pro-

crastination. Each student receiving an *I* should contact his professor to determine the steps to be taken to remove the *I*. The deadline for removing an *I* received in the first semester is the Easter recess of the following semester; for removing an *I* received in the second semester or the Summer Session, the deadline is the Thanksgiving recess of the next semester. When the instructor records a grade of *I* on the final grade card, he must also record the grade to which the *I* will revert if the work is not made up by the deadline; that grade would be computed on the basis of what grades or other evidence the instructor does have, averaged together with *F*'s for all the incompleting work (including the final examination, if it is not taken). If the work is completed prior to the deadline, the instructor will report a change of grade, taking the completed work into consideration.

**Grade points** are given for all courses in which grades of *A, B, C, D, or F* are reported. They are computed as follows: for each credit received in a course, 4 grade points are granted if the grade is *A*, 3 if *B*, 2 if *C*, 1 if *D*, 0 if *F*.

**Grade-point ratios** are determined by dividing the total number of grade points by the total number of credits for which a student has been registered. Courses for which grades of *W, I, NC* or *CR* have been recorded are not included in the computation of ratios.

**Grade Reports.** Grade reports are sent to students through the mail at the end of each semester and summer session.

## CREDIT—NO CREDIT OPTION (formerly Pass-Fail Option)

The major purpose of the Credit-No Credit Option is to encourage students to broaden their education by venturing into subject areas outside their fields of specialization without hazarding a relatively low grade. Under the option, students receive grades of *CR* (Credit) or *NC* (No Credit). These do not carry grade points, therefore are not computed in the student's grade-point ratio.

The Credit-No Credit Option may be exercised at any time during the semester, but no later than the last day for withdrawal from classes, and only under the following conditions:

1. Except as noted, courses taken under the *CR/NC* option may not be applied toward the requirements for the master's degree. Only 699/799 directed reading/research courses may be taken on *CR/NC* at the option of the graduate field of study and may be granted credit toward a master's degree within the limits already prescribed by the Graduate Division (two credits in Plan A thesis programs).
2. A course for which a grade of *NC* is received may be retaken under the *CR/NC* option, or under the regular letter-grade system.
3. The *CR* designation in the non-letter grade system denotes *D*-caliber work or better.

4. The NC designation and the course in which it is received will appear in official records as part of the student's academic history.
5. The NC designation affects neither the credit hours total nor the grade-point total of the student.
6. The CR designation assumes all functions and meanings of the former P (Pass) designation.

## REQUIREMENTS FOR CONTINUED REGISTRATION

To remain eligible for further graduate work and to be awarded a graduate degree, candidates and intended candidates must have a *B* average (3.0 grade-point ratio) for all courses numbered 300-499 and 600-799 they have completed. In addition, they must also have a *B* average for all graduate courses (i.e., courses numbered 600 and above) they have completed. Grades for courses numbered 100-299 and 500-599 will not be computed in the grade-point ratio.

Credit-hour requirements for graduate degrees can only be fulfilled by grades of *A*, *B*, and *C* except for 699/799 courses taken under the Credit-No Credit Option. Grades of *CR* for 699/799 directed reading or research courses are counted in credit-hour requirements within stated rules, but are not computed for grade-point ratios. Grades of *NC* taken under the Credit-No Credit Option are not computed. Grades of *D* and *F* will not be counted toward the completion of requirements for advanced degrees but will be counted in computing the grade-point ratio. In computing the GPR of a student who has been required to retake a course in which he received a grade of *C*, *D*, or *F*, all grades in that course will be included, as will the appropriate number of units for each time the course was repeated. For a *C* grade, however, the course will be counted only once for purposes of fulfilling the requirements for a graduate degree.

Intended candidates and candidates whose cumulative grade-point ratios fail to meet the minimum requirements after completing two or more semesters and upon completion of at least 12 credit hours of course work will be placed on academic probation for the following semester. Those on probation who fail to attain the minimum standards at the end of the probationary period will be denied further registration in the Graduate Division.

Graduate students who are not working for graduate degrees, certificates, or diplomas must have a minimum grade-point ratio of 2.5 upon completion of 12 credits or more. Students failing to maintain this level of achievement will be denied further registration in the Graduate Division.

For purposes of these rules, a "semester" is the calendar period—and two summer sessions will equal one semester—regardless of the number of credits taken.

Two grades below *B* in undergraduate courses taken during the first semester as a graduate student at the University of Hawaii may be excluded when the Graduate Division computes the grade-point ratio if a petition, filed by the student and recommended for ap-

proval by the chairman of the graduate faculty, is approved by the Dean. If these grades are so excluded, the concomitant course credits may not be counted toward fulfillment of requirements for graduation degrees. Such waivers will not alter the official University record of student grades and grade-point ratios.

## DIPLOMAS

An application for a diploma must be filed with the Graduate Division at the beginning of the semester in which the student expects to complete his degree requirements.

## DEGREE CHECKS

An appointment for a degree check must be made at the time the student registers for his final semester of work. At this time the student will be informed of missing grade labels, Progress Report Forms, etc.

The Graduate Division will automatically cross off the graduation list the name of any student whose final grade label contains either a grade of *I* (incomplete) or a missing grade, unless a certification is received beforehand from the chairman of his graduate field of study that the course is not a requirement for the degree.

23

## CONFERRING OF DEGREES

Degrees are conferred and diplomas awarded four times annually, in December, May, August and September. Commencement exercises are held in December, May, and August. Students completing their degree requirements at any time during the year may, upon request, receive certification from the Dean of the Graduate Division that the degree will be conferred at the end of the appropriate semester.

Diplomas may be obtained from the admissions and records office. Inquiries regarding diplomas should be addressed to: Admissions and Records, 2444 Dole St., not to the Graduate Division.

## TRANSCRIPTS

Transcripts may be obtained from the admissions and records office.

## RESPONSIBILITY

Students admitted to the Graduate Division are assumed to be mature adults and are expected to behave accordingly. Though advisory services are provided to assist the students, the student alone is responsible for following the procedures and completing the steps required in his program. Requirements of the Graduate Division, both procedural and substantive, may be waived only by written request of the student and/or committee concerned and must have the written approval of the Dean. Petition forms are available in department offices and the Graduate Division office.

**DEGREES, REQUIREMENTS, AND PROCEDURES****MASTER'S DEGREES**

The University of Hawaii confers the degrees of Master of Arts, Master of Business Administration, Master of Education, Master of Fine Arts, Master of Library Studies, Master of Music, Master of Public Health, Master of Science, Master of Social Work, and Master of Architecture.

The Master of Arts is offered in:

American Studies • Anthropology • Art  
Asian Studies • Asian Languages (Chinese, Japanese)  
Classics • Drama and Theatre • Economics  
English • French • Geography • German • History  
Linguistics • Mathematics • Music • Pacific Islands  
Studies • Philosophy • Political Science • Psychology  
Sociology • Spanish • Speech-Communication  
Teaching of English as a Second Language

The Master of Science is offered in:

Agricultural Economics • Agricultural Engineering  
Agronomy and Soil Science • Anatomy • Animal  
Sciences • Astronomy • Biochemistry • Biophysics  
Botanical Sciences • Chemistry • Civil Engineering  
Electrical Engineering • Entomology • Food Science  
Genetics • Geology & Geophysics • Horticulture  
Information Sciences • Mechanical Engineering  
Meteorology • Microbiology  
Nursing • Nutrition • Ocean Engineering  
Oceanography • Pharmacology • Physics • Physiology  
Public Health • Speech Pathology & Audiology  
Zoology

The Master of Education is offered in:

Educational Administration	Elementary Education
Educational Communications	Educational Psychology
Educational Foundations	Secondary Education

The Master of Architecture is designed to provide intensive professional study and to meet the criteria of professional licensing boards.

The Master of Fine Arts is offered for creative production rather than research in: Art • Drama and Theatre.

The Master of Music is offered for composition and performance in Music.

The Master of Library Studies is offered by the Graduate School of Library Studies. For requirements, etc., see the bulletin of the Graduate School of Library Studies.

The Master of Social Work is offered by the School of Social Work. For requirements, etc., see the bulletin of the School of Social Work.

The Master of Public Health is offered by the School of Public Health. For requirements, etc., see the bulletin of the School of Public Health.

**Residence**

The minimum residence requirement is two semesters of full-time work or four six-week summer sessions or the equivalent in credits. For the Master of Social Work and the Master of Fine Arts in visual arts, four semesters of full-time work are required.

**Time Allowed**

Candidates for the master's degree who fail to complete all requirements within five years after admission to candidacy must be readmitted to candidacy by the Dean of the Graduate Division before they can proceed. All work must be completed within seven years preceding the date upon which the degree is conferred.

Candidates for the doctoral degree will normally be expected to complete all requirements within six years after admission into the doctoral program.

**Transfer of Credits**

Upon recommendation of the graduate faculty and no later than admission to candidacy, up to one-half of the total course credits required in a given field of study may be transferred, provided, however, that at least one-half the credits required in graduate courses (numbered 600 and above) are completed at the University of Hawaii. Up to 6 credits of work completed at another accredited institution following admission to candidacy may be transferred to this University, providing such transfer does not exceed the maximum allowable. No credit may be transferred from another institution unless the grade is *B* or better.

For an East-West Center student whose program includes a semester or two at mainland or Asian universities, the total number of credits approved for transfer before the student leaves for his field study will be automatically transferred, provided that the Graduate Division receives official transcripts of records from the institutions attended. All course credits and grades will be computed into the student's grade-point ratio. The student is responsible for delivering the transcripts to the Graduate Division.

**Progress Report Forms**

The Graduate Division issues to each graduate field of study a set of printed forms for each new graduate student who enrolls. The graduate field of study uses these progress report forms to notify the Graduate Division of the student's progress toward his degree. The "Summary of Procedure" after each degree discussed on the following pages lists the forms which are submitted to the Graduate Division and the copies which are sent to the student.

**Rules and Requirements**

The rules and requirements listed below are those of the Graduate Division and must be observed by all graduate students. Please note, however, that for some programs of study there are special requirements. For each field of study there is a statement of special requirements, if any, for the master's and doctoral degrees.

## PLAN A (THESIS)

Unless otherwise stated, Plan A is available in all fields of study.

**Credit-Hour Requirements.** A minimum of 30 credit hours are required, including a minimum of 18 credit hours of course work and between 6-12 credit hours of thesis research, depending on the requirements of the graduate field of study. A minimum of 12 credits, exclusive of research methods courses, must be earned in courses numbered 600-799, including at least one graduate seminar in the major field or in a related field. A maximum of 2 credits may be allowed in directed research courses (699 and 799).

Candidates must be registered in the appropriate thesis research course (800) during the entire term in which the work for the degree is completed. Candidates who accumulate the maximum number of thesis research credits but fail to complete all degree requirements *must* register for a minimum of one credit of thesis research at the beginning of the term in which the degree is awarded.

Candidates who complete all requirements for the degree during the six-week summer terms need not be registered during the subsequent fall semester.

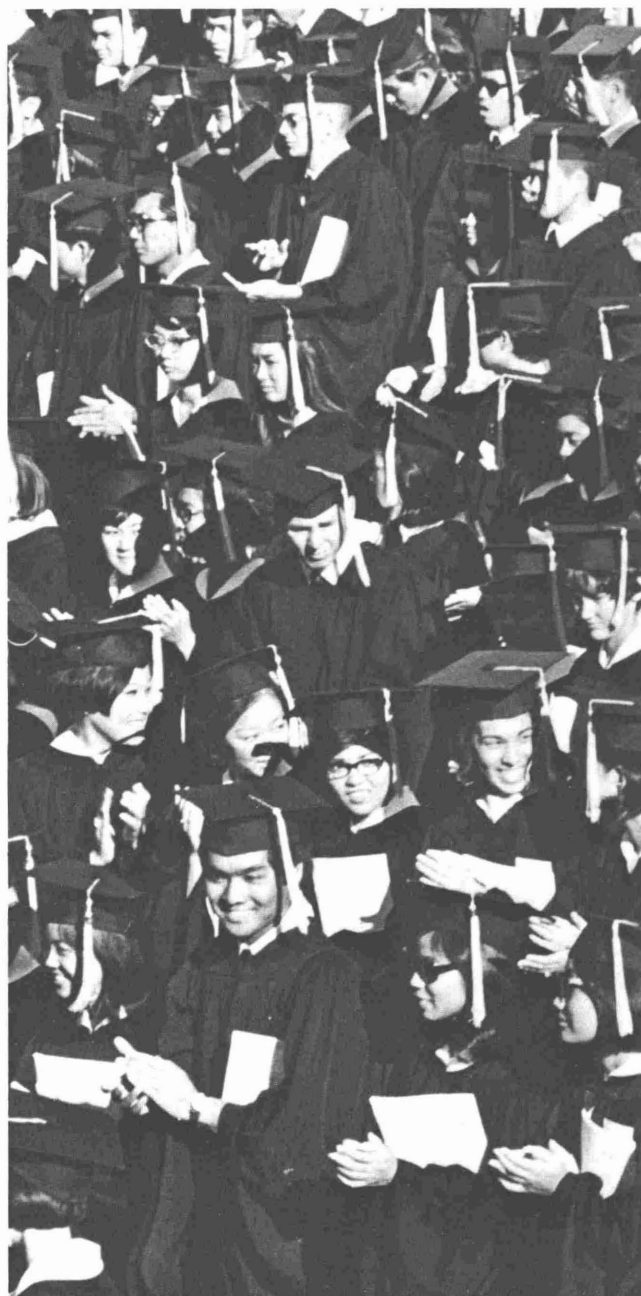
**Thesis Requirement.** When a thesis problem has been approved by the graduate faculty of the student's field of study, the chairman of the graduate field of study sends to the Graduate Division the candidate's name, the thesis title, and a recommendation for membership of the thesis committee by January 15 for May graduation, May 15 for December graduation, and by February 1 for those who expect to complete their degree requirements during the summer session. The student may then enroll in the thesis research course (800) at the beginning of the next academic term. Students *must* register for Thesis 800 during the announced registration period. Students given special permission by the Graduate Division to register after the announced registration period will be assessed a late registration fee or a change of registration fee, whichever is applicable.

Upon request by the thesis committee relevant work done by the student in directed research (course 699) may be utilized as part of the thesis research. In such instances, the total credit for such directed research (course 699) and thesis research (800) to be applied toward the minimum requirement for the degree shall not exceed the maximum specified for thesis credit (6-12).

The thesis committee is made up of three members of the graduate faculty.

The chairman of the thesis committee is primarily responsible for directing and guiding the candidate's research and writing activities. It is the responsibility of the student to keep all members of the committee informed of the scope, plan, and progress of both the research and the thesis. Instructions for thesis preparation can be obtained at the Graduate Division office.

Copies of the completed thesis must be submitted to committee members at least two weeks prior to the



date of the final examination. The original and first carbon copies, signed by all members of the committee, must be deposited with the Graduate Division by the deadline specified in instructions issued to all candidates at the beginning of the session in which the degree is conferred. Additional bound copies may be required by individual departments.

### Examinations

**General Examination.** At the option of the faculty of the field of study, a general examination may be required before a student is advanced to candidacy for a master's degree. All students within a particular field of study must take the examination if it is required at



all. The examination is usually given during the first semester of residence. It is designed to reveal the quality of the student's preparation for advanced work in his field and his ability to pursue graduate work at the master's level. The examination also enables the student's committee or adviser to assist in planning a program that will overcome any deficiencies in the student's background.

A student who passes the examination may be recommended for advancement to candidacy for the master's degree. A student who fails the general examination may repeat it once. However, he will not be considered for candidacy again should he fail the general examination the second time.

In fields of study not requiring a general examination, the student may be advanced to candidacy upon the recommendation of his adviser and/or the graduate faculty of the field of study concerned. It is assumed that in these cases the recommendation for advancement to candidacy will be based on some other form of evaluation of the student's potential performance rather than of his performance in the general examination.

**Final Examination.** A final oral examination, covering the thesis and related areas, may be required by individual graduate fields of study. All students within a particular field of study must take the examination if it is required at all. It should be held at least three weeks before the end of the term during which the degree is conferred. It is conducted by the thesis committee and is open to all graduate faculty members. As an alternative, the committee chairman may have the candidate present results of the thesis at a departmental graduate seminar, but all members of the thesis committee must be present.

Should the student fail the final examination he may repeat it only once. If the field of study does not require a final examination, the chairman of the graduate faculty concerned reports the completion of all degree requirements on Progress Report Form VI.

#### Summary of Procedure

1. Application for admission to the Graduate Division.
2. Preliminary conference; appointment of interim adviser.  
(Progress Report Form I submitted to Graduate Division, with copy to student.)
3. General examination, if required, and admission to candidacy.  
(Form II submitted, with copy to student.)
4. Appointment of thesis committee. (Form III submitted, with copy to student.)
5. Approval of thesis topic. (Form IV submitted, with copy to student.)
6. Application diploma, payment of graduation and thesis binding fee.
7. Completed thesis submitted to committee.
8. Final oral examination, if required. (Form VI submitted; student notified of results.)
9. Final copies of thesis submitted to Graduate Division.
10. Granting of the degree.

#### PLAN B (NONTHEISIS)

Plan B is available only in the following fields of study:

Agricultural Economics • Agricultural Engineering  
 American Studies • Anthropology • Art (Eastern Art History) • Asian Languages (Chinese, Japanese)  
 Asian Studies • Astronomy • Biochemistry • Biophysics  
 Botanical Sciences • Business Administration  
 Civil Engineering • Drama and Theatre • Economics  
 Educational Administration • Educational Communications • Educational Foundations  
 Educational Psychology • Electrical Engineering  
 Elementary Education • English • Entomology  
 Food Science • Genetics • Geography  
 Geology and Geophysics  
 German • History • Horticulture • Information Sciences • Library Studies • Linguistics  
 Mathematics • Mechanical Engineering  
 Meteorology  
 Microbiology • Music Education • Music Performance  
 Nursing • Ocean Engineering • Pharmacology  
 Philosophy • Physics • Physiology • Plant Pathology  
 Political Science • Public Health • Secondary Education • Social Work • Sociology • Spanish  
 Speech-Communication • Teaching of English as a Second Language • Zoology

**Credit-Hour Requirements.** A minimum of 30 graduate credit hours is required. A minimum of 18 credits must be earned in courses numbered 600-799, including at least one graduate seminar in the major field or in a related field.

When the student is advanced to candidacy, the chairman of the field of study appoints a program adviser or a program committee made up of three members of the graduate faculty. The program adviser/committee advises the candidate and approves a coherent program of courses for the candidate.

#### Examinations

**General Examination.** At the option of the faculty of the field of study, a general examination may be required before a student is advanced to candidacy for a master's degree. All students within a particular field of study must take the examination if it is required at all. The examination is usually given during the first semester of residence. It is designed to reveal the quality of the student's preparation for advanced work in his field and his ability to pursue graduate work at the master's level. The examination also enables the student's committee or adviser to assist in planning a program that will overcome any deficiencies in the student's background.

A student who passes the examination may be recommended for advancement to candidacy for the master's degree. A student who fails the general examination may repeat it once. However, he will not be considered for candidacy again should he fail the general examination the second time.

In fields of study not requiring a general examination, the student may be advanced to candidacy upon the recommendation of his adviser and/or the graduate faculty of the field of study concerned. It is assumed

that in these cases the recommendation for advancement to candidacy will be based on some other form of evaluation of the student's potential performance rather than on his performance in the general examination.

**Final Examination.** At the option of the faculty of the field of study, a final examination may be required of Plan B candidates for the master's degree. If required, it is designed to determine the candidate's achievement in his field of study at the master's level. This examination has several possible forms. It may be a seminar appearance, a written comprehensive examination, an oral examination, some equivalent, or a combination of these. If a final examination is required by the field of study, it must be given at least three weeks before the end of the term during which the degree is conferred.

Should the student fail the final examination, he may be permitted to repeat it only once. A student who fails the examination a second time is irrevocably dropped from the program.

#### Summary of Procedure

1. Application for admission to the Graduate Division.
2. Preliminary conference; appointment of interim adviser. (Progress Report Form I submitted to Graduate Division, with copy to student.)
3. General examination, if required, admission to candidacy, and establishment of degree plan. (Form II submitted, with copy to student.)
4. Appointment of program committee/adviser. (Form III submitted, with copy to student.)
5. Diploma application, payment of graduation fee.
6. Final examination, if required.
7. Completion of course work.
8. Granting of the degree. (Form VI submitted; student notified of results.)

### PLAN C (EXAMINATIONS)

Plan C is available on a two-year experimental basis in Agronomy and Soil Science, Economics, English, English as a Second Language, Linguistics, and Mathematics. Neither a thesis nor a certain number of course credits is required by this plan. Rather, the student is asked to demonstrate competence by examination.

A preliminary conference will be held to discuss with the student his objectives and how to meet them, and to determine the general program the student will follow in order to prepare himself for the required examinations. The conference will be conducted by the chairman of the graduate field of study or by a member of the graduate faculty designated by him. The plan of study developed at this conference may include course work and/or independent study and research. Each field of study specifies its own requirements in addition to the following.

#### Examinations

**General Examination** (oral and/or written). A general exploratory examination will be given to determine if the intended candidate should be admitted to candidacy for the master's degree under Plan C, and to ascertain weaknesses in the student's academic preparation and

how to overcome them. This examination is designed to reveal the quality of the student's preparation for advanced work in his field and his ability to pursue graduate work at the master's level. The examination will be conducted by the student's interim adviser and the graduate faculty of the field of study or a committee thereof consisting of at least three members of the faculty. It is given during the first semester of residence, and is from one to two hours in length. A student who fails the general examination may repeat it after three months only if a petition, recommended for approval by the graduate faculty of the major field of study, is approved by the Dean of the Graduate Division. The student will not be considered for candidacy again should he fail the general examination twice.

**Final Examination** (written and oral). A final examination or series of examinations, written and oral, will be given to determine the candidate's comprehension of his field of study at the master's level. Since there are no course requirements for this Plan, the final examinations will be designed to give the student opportunity to demonstrate a level of achievement consonant with the level of achievement required by Plans A and B. It is assumed that many students will prepare themselves for the examinations by taking courses recommended by advisers.

Specifications for the number of written examinations required, what they cover, and the amount of time required for each (two or three hours or more for written examinations and one or more for the oral portion) are set forth in the statement of requirements in each field of study. The written examinations may be given by the candidate's committee or by an examination committee of graduate faculty members constituted for that purpose.

The oral portion of the final examination follows the written portions and must be held at least three weeks before the end of the term during which the degree is conferred. It is conducted by the candidate's committee and is open to all members of the graduate faculty.

If the candidate fails the final examination, he may be allowed to repeat it upon petition approved by the graduate faculty concerned and the Dean of the Graduate Division. Should the student fail the final examinations a second time, he is irrevocably dropped from candidacy.

#### Summary of Procedure

1. Application for admission to the Graduate Division.
2. Preliminary conference; appointment of interim adviser (Progress Form I submitted to Graduate Division, with copy to student).
3. General examination and admission to candidacy (Form II submitted, with copy to student).
4. Appointment of program committee (Chairman and at least two other members; Form III submitted, with copy to student).
5. Application for diploma.
6. Final examinations (Form VI submitted, student notified of results).
7. Payment of graduation fees.
8. Granting of degree.





## DOCTOR OF PHILOSOPHY

28

The degree of Doctor of Philosophy is awarded only for the most distinguished scholarly achievement. The quality of a candidate's work is judged by a variety of means culminating in a set of comprehensive and final examinations and a dissertation. The dissertation must be a significant original contribution to knowledge in the candidate's chosen field. The additional, special requirements in any given field of study, as stated below, are designed to prepare the candidate for the examinations and successful completion of his dissertation.

No faculty or staff member of CI-3, R-3, or higher rank may be awarded either a master's or doctoral degree by the University of Hawaii in the graduate field of study administered by the department in which he is employed.

Candidates are accepted only in fields of study in which the teaching staff, library, laboratory equipment, and cooperative relationships with other research institutions make it possible to offer training. These are:

Agricultural Economics • Agronomy and Soil Science  
 American Studies • Anthropology • Asian  
 Languages (Japanese) • Astronomy  
 Biochemistry • Biophysics  
 Botanical Sciences • Chemistry • Drama and Theatre  
 Economics • Educational Psychology  
 Electrical Engineering • Entomology • Genetics  
 Geography • Geology and Geophysics  
 History • Horticulture • Linguistics  
 Mathematics • Meteorology • Microbiology  
 Ocean Engineering • Oceanography • Pharmacology  
 Philosophy • Physics • Physiology • Political  
 Science • Psychology • Sociology • Zoology

### Residence

The minimum residence requirement is three semesters of full-time work or the equivalent in credits at the University of Hawaii.

### Time Allowed

A candidate for the doctoral degree will normally be expected to complete all requirements within six years after admission into the doctoral program.

### Credits

There are no course credit requirements for the Ph.D. degree; nonetheless, candidates may be advised or required to enroll in courses if, in the opinion of their advisers or the faculty in charge of the program of study, these courses are essential to preparation for the examinations required of all candidates. For information regarding required or recommended courses, see the section of this bulletin appropriate to the field of study.

### Language Requirements

At the option of the graduate field of study, the intended candidate for the Ph.D. degree may be required to demonstrate comprehension of one foreign language. To test for comprehension, the student will be given a written examination. To pass the examination he must be able to read at reasonable speed research materials in his field of interest. English is not considered a foreign language in this context. The agency to administer the examination is designated by the graduate faculty of the fields of study, but all students within a particular field of study must be examined by the same agency for examinations offered by that agency.

No limit has been placed on the number of times a student may take the examination. However, it must be passed before a student can be advanced to candidacy and before he may take the comprehensive examination.

### Doctoral Committee

The doctoral committee may be selected at any time after a student becomes an intended candidate. The chairman of the graduate faculty of the field of study recommends to the Dean of the Graduate Division appointment of a doctoral committee consisting of at least *five* members of the graduate faculty, including representatives of the minor field or fields. This committee, appointed by the Dean of the Graduate Division, prescribes for the candidate a course of study in preparation for the comprehensive examination. The committee conducts the comprehensive and oral examinations described below. It also approves the dissertation research problem and dissertation itself (see below).

### Examinations

Doctoral candidates must pass the following examinations:

#### Qualifying Examination (optional to fields of study)

Some fields of study require a Ph.D. qualifying examination. The purpose of this examination is to determine whether to encourage a student to proceed in a doctoral program, and if encouraged, to enable his advisers to assist him in planning a program that will familiarize him with the requisite knowledge and techniques of his chosen field of study. Fields of study requiring this examination give it early in the intended candidate's program (often coinciding with the master's final examination). It may be oral and/or written, and is conducted either by a special examination committee appointed by the chairman of the graduate field of study or by the student's doctoral committee.

#### Comprehensive Examination

The comprehensive examination is an important step in the sequence toward the Ph.D. degree. This examination covers the major field of study and work fundamental thereto and minor fields as may be required by the field of study. Its purpose is to ascertain the student's comprehension of his field(s) of study.

The examination is given only after the student has completed his foreign language requirement, if required, and when, in the judgment of his doctoral committee, he has had sufficient preparation in his field of study either through course work or other individual study and research. The comprehensive examination may be either oral or oral and written. It is conducted by the student's doctoral committee composed of five members of the graduate faculty, at least one being from outside the major field of study and outside the department responsible for the field of study.

Students who fail the comprehensive examination may repeat it once at the discretion of the graduate

faculty concerned. A student who fails the second examination is irrevocably dropped from the program.

The student who passes the examination is eligible, at the option of the various fields of study, to receive a University certificate indicating that he has completed all requirements of the Ph.D. except for the dissertation.

### Final Examination

A final examination in defense of the dissertation, which may also cover related subjects, is required of all candidates for the Ph.D. degree. The examination is oral and is conducted by the candidate's doctoral committee. It is never less than one hour in length. Arrangements for it must be made at least one month in advance, and it must occur at least six weeks before the end of the session in which the degree is granted. The examination is announced in the *University Bulletin* and is open to the public.

If the candidate fails the final examination, he may be allowed to repeat it upon petition approved by the graduate faculty concerned and the Dean of the Graduate Division. If the candidate fails the final oral examination twice, he is dropped from candidacy.

If the candidate passes the examination, all other requirements having been met, he will be awarded the Ph.D. degree at the end of the appropriate term.

### Dissertation

A minimum of three members of the doctoral committee of five must read the dissertation. The committee will make the decision with the student on which three will read the dissertation and affix their signatures to the title page. This policy does not preclude all five members from reading the dissertation.

The doctoral dissertation is expected to be a scholarly presentation of an original contribution to knowledge resulting from independent research and should be suitable for publication.

When the dissertation topic has been approved by the doctoral committee, it will notify the Graduate Division. The candidate may then register for the dissertation research course (800) during the next registration period.

A graduate student may undertake a research problem when the subject is primarily in one field but has close relationship to other fields; in such an event, at the time the student submits his dissertation proposal, it must be ensured that: (1) the student possesses sufficient knowledge of the related field or fields to be able to deal competently with the research and dissertation, and (2) a representative of the related field is placed on the student's doctoral committee.

The candidate should look to the chairman of his doctoral committee for primary direction regarding research methods and the preparation of results. It is the joint responsibility of the chairman and the student to see that all members of the committee are kept informed of the scope, plan, and progress of both the research and the dissertation. A brochure on instructions for preparation of the dissertation can be obtained at the Graduate Division office.

Copies of the completed dissertation must be submitted to committee members at least four weeks prior to the date of the final oral examination. The original and first carbon copies must be deposited with the Graduate Division by the deadline specified in instructions issued to all candidates at the beginning of the session in which the degree is conferred. Additional bound copies may be required by individual departments.

A majority of the members of the doctoral committee must approve both the dissertation and the examination on the dissertation. A minority member has the right of appeal to the Graduate Division Council for a final decision. The chairman must ensure that the final form of the dissertation, including revisions, and amendments agreed upon, is acceptable to a majority of the committee. The committee members express their approval on the signature page of the dissertation.

Candidates must be registered in the appropriate thesis research course (800) during the entire term in which the work for the degree is completed. Candidates who accumulate the maximum number of thesis research credits but who fail to complete all degree requirements must be registered for a minimum of one credit of thesis research during the term in which the degree is awarded.

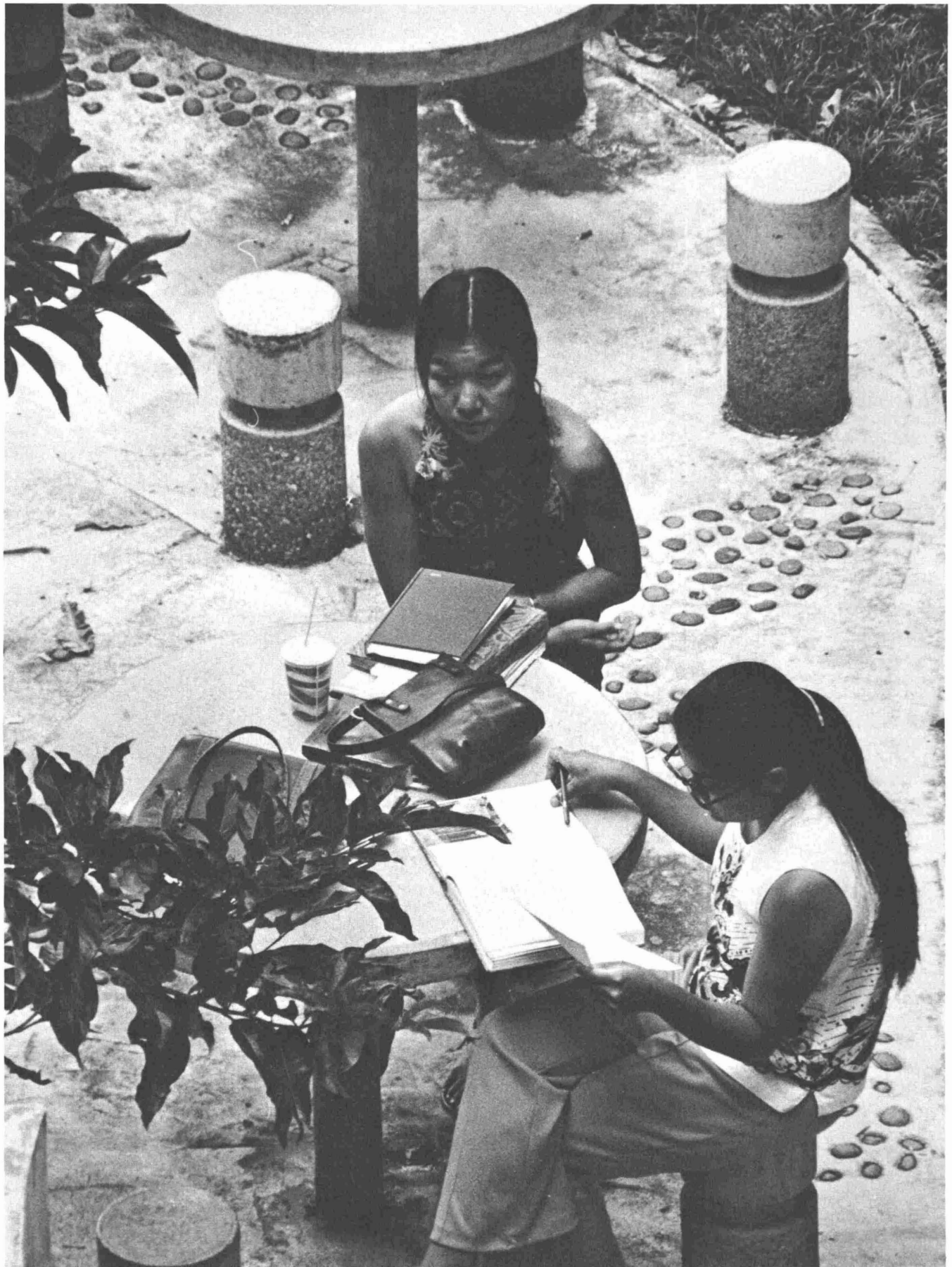
Candidates who complete all requirements for the degree during the six-week summer terms need not be registered during the subsequent fall semester.

Chairman of graduate fields of study have the privilege of being ex officio members of all doctoral committees in the field.

### Summary of Procedure

1. Application for admission to the Graduate Division.
2. Preliminary conference; appointment of interim adviser. (Progress Report Form I submitted to Graduate Division, with copy to student.)
3. Certification of proficiency in a foreign language; admission to candidacy. (Form II submitted, with copy to student.)
4. Appointment of doctoral committee. (Form III submitted, with copy to student.)
5. Approval of dissertation proposal. (Form IV submitted, with copy to student.)
6. Certification of proficiency in second foreign language, where required; comprehensive examination. (Form V submitted.)
7. Diploma application, payment of graduation and dissertation binding fee.
8. Abstract of dissertation filed with the Graduate Division.
9. Final examination. (Form VI submitted.)
10. Copies of dissertation filed in Graduate Division.
11. Granting of the degree.

The above order is that usually followed, but at the pleasure of the graduate faculty of any field of study, admission to candidacy and beginning of dissertation research may be delayed until after successful performance on the comprehensive examination.



# Graduate Fields of Study

## FACULTIES, REQUIREMENTS , AND COURSES

Courses listed here numbered 300-499 are undergraduate courses which may be available for graduate programs in the major field. Courses numbered 600 and above are graduate courses.

Only the number, title, and credit of courses are given. Course descriptions will be found in the University's *General Catalog*. Students should consult the time schedules issued prior to the opening of sessions for information on courses offered, credit, instructors, etc.

In addition to the minimum requirements stated in the forepart of this *Bulletin*, specific requirements are indicated here by fields of study.

### Agricultural Economics

#### *Graduate Faculty*

F. S. Scott, Jr., Ph.D. (Chairman)—market development  
R. N. Anderson, Ph.D.—resource economics  
H. L. Baker, Ph.D.—resource economics  
J. R. Davidson, Ph.D.—production and marine economics  
C. Gopalakrishnan, Ph.D.—resource and marine economics  
J. T. Ishida, Ph.D.—marketing  
J. T. Keeler, M.S.—farm management  
A. B. Larson, Ph.D.—price analysis  
N. G. M. Luykx, II, Ph.D.—agricultural policy  
W. G. Marders, Ed. D.—rural sociology and extension  
B. M. Renaud, Ph.D.—econometrics and regional economics  
H. Spielmann, Ph.D.—marketing and agricultural policy  
C. P. Wilson, Ph.D.—marketing and agricultural policy  
H. Yamauchi, Ph.D.—resource economics

#### *Affiliate Faculty*

W. L. Collier, Ph.D.—production economics  
K. Gertel, Ph.D.—resource economics  
H. C. Hogg, Ph.D.—resource economics  
P. P. Wallrabenstein, Ph.D.—statistics

The department offers a master's degree program under Plan A (thesis) or Plan B (nonthesis), and a pro-

gram leading to the Ph.D. If the master's degree is expected to be a terminal degree, the student is encouraged to pursue Plan A.

Students may in some instances be admitted to the master's program in agricultural economics although undergraduate training was in a different but related field providing that deficiencies in preparation are satisfied either by examination or by completion of the appropriate courses.

The Ph.D. program may include a major in production economics, marketing, resource economics, agricultural economic development, agricultural finance, price analysis, or a related area upon the approval of the student's Ph.D. committee. The student may also select one or more minors in related fields.

In addition to the oral comprehensive examination required by the Graduate Division, the Ph.D. candidate is required to pass written comprehensive examinations in four fields:

- (1) Economic theory, emphasizing micro economics, macro economics and history of economic thought.
- (2) Agricultural economics, including production economics, farm management, land and resource economics, marketing, price analysis, and agricultural policy.
- (3) Quantitative methods, including research tools, statistics, and econometrics.
- (4) Specialized field in agricultural or resource economics.

The department requires a minimum core requirement for both the M.S. and Ph.D. programs. For further information, request departmental brochure on procedures and requirements from the chairman of the department.

AGRICULTURAL ECONOMICS (AgEc)

- 410 Introduction to Quantitative Methods in Agricultural Economics (3)
- 427 Management of Agri-Business Firms (3)
- 428 Production Economics (3)
- 429 Agricultural Policy and Planning (3)
- 430 Agricultural Finance (3)
- 432 Introduction to Natural Resource Economics (3)
- 434 Statistical Methods (3)
- 470 Regional Economic Analysis (3)
- 480 Computer Programming in Agricultural Economics Research (3)
- 624 Research Methodology (3)
- 625 Economics of Agriculture: Tropical Countries and Asia (3)
- 626 Collection of Economic Data in Agriculture (3)
- 629 Advanced Production Economics (3)
- 630 Advanced Agricultural Market Analysis (3)
- 634 Quantitative Methods and Statistical Analysis (3)
- 635 Seminar: Agricultural Price Analysis and Statistics (3)
- 636 Seminar: Agricultural, Resources, and Ecological Policy (3)
- 637 Resource Economics (3)
- 638 Seminar: Land Use in Developing Countries (3)
- 639 Agricultural Development Economics and Development Planning (3)
- 640 Agriculture and Rural Development Administration (3)
- 680 Rural Sociology and the Agricultural Economy (3)
- 699 Directed Research (v.)
- 701 Seminar in Agricultural Economics (v.)
- 800 Thesis Research (v.)





## Agricultural Engineering

### Graduate Faculty

- J. K. Wang, Ph.D. (Chairman)—harvesting and processing equipment, soil dynamics  
 H. M. Gitlin, M.S.—agricultural process engineering  
 E. B. Hundtoft, Ph.D.—experimental design, agricultural machinery  
 D. M. Kinch, Ph.D.—agricultural machinery, environment control  
 Tung Liang, Ph.D.—systems engineering  
 M. R. Smith, Ph.D.—agricultural machinery  
 I-pai Wu, Ph.D.—irrigation engineering

### Affiliate Faculty

- W. N. Reynolds, M.S.—irrigation

Intended candidates for the M.S. must present a bachelor's degree in an accredited engineering program or the equivalent.

Agricultural engineering courses available for the graduate program are listed below. Courses from related fields of engineering, agriculture and sciences may also be utilized to fulfill the course credit requirements. Candidates may specialize in fruit and nut harvesting equipment, fruit and nut processing equipment, machinery management, soil dynamics, precooling and storage of fresh product, surface hydrology, irrigation engineering, environment control engineering, and physical properties of biological materials. Required courses are marked with an asterisk.

### AGRICULTURAL ENGINEERING (AgEng)

- 331 Mechanizing Food Production I (3)  
 332 Engineering Application in Food Production (3)  
 333 Computer Programming for Bio-science (3)  
 431 Agricultural Power (3)  
 432 Agricultural Implements (3)  
 435 Irrigation Principles and Practices (3)  
 499 Directed Research (v.)  
 622 Experimental Methods in Cause-Effect Modeling (3)  
 631 Analysis of Implement Design (3)  
 635 Farm Irrigation System Design (3)  
 638 Systems Analysis in Bio-sciences (3)  
 647 Methods of Agricultural Engineering (3)  
 648 Post Harvest Process Engineering (3)  
 699 Directed Research (v.)  
 \*700 Seminar (1)  
 \*800 Thesis Research (v.)

## Agronomy and Soil Science

### Graduate Faculty

- W. G. Sanford, Ph.D. (Chairman)—plant nutrition  
 D. P. Bartholomew, Ph.D.—crop physiology  
 P. C. Ekern, Ph.D.—soil management, agricultural meteorology  
 S. A. El-Swaify, Ph.D.—soil salinity, physical chemistry  
 R. L. Fox, Ph.D.—soil fertility and chemistry, soil and management  
 R. E. Green, Ph.D.—soil pesticide integrations, soil physics  
 H. Ikawa, Ph.D.—soil mineralogy, soil genesis and classification  
 Y. Kanehiro, Ph.D.—soil chemistry, fertility

D. L. Plucknett, Ph.D.—crop management, weed control, soil fertility

- P. P. Rotar, Ph.D.—plant breeding  
 J. A. Silva, Ph.D.—soil fertility and soil chemistry, statistics  
 L. D. Swindale, Ph.D.—soil genesis and classification, physical chemistry  
 Y. N. Tamimi, Ph.D.—forest soils, fertility  
 J. R. Thompson, Ph.D.—crop production, pasture management  
 G. Uehara, Ph.D.—soil physics, mineralogy; soil management  
 U. Urata, Ph.D.—cytogenetics, breeding of grasses and sugar cane  
 A. S. Whitney, Ph.D.—pasture management, forage physiology  
 H. Y. Young, M.S.—plant chemistry, nutrition, pesticide chemistry

### Affiliate Graduate Faculty

- D. J. Heinz, Ph.D.—sugar cane breeding  
 M. Isobe, Ph.D.—sugar cane agronomy  
 Tung Ming Lai, Ph.D.—soil chemistry, fertility, sugarcane agronomy  
 D. D. Williams, Ph.D.—pineapple agronomy

This graduate field of study offers two options, one in agronomy and the other in soil science. The first option is designed for candidates whose primary interests lie with crop science, and the second option is designed for students who wish to place greater emphasis on soils.

Intended candidates for the M.S. or Ph.D. degrees must present a minimum of 18 undergraduate credits either in agronomy or in soil science and subject matter related to one of these. Applicants must also submit to the department scores for the aptitude and advanced (biology) tests of the Graduate Record Examination. The soil science option also requires two years of college chemistry. Related fields for agronomy are animal science, botany, chemistry, climatology, genetics, horticulture, plant pathology, plant physiology, soil science, and zoology. Related subject matter fields for soil science are agricultural engineering, agronomy, botany, chemistry, geosciences, mathematics, microbiology, and physics.

A general examination will be required of all intended M.S. candidates during the first semester of enrollment. The examination will consist of two parts; a basic examination in the natural and physical sciences, and selected questions representing major agronomy and soil science disciplines. All M.S. candidates must register for seminar in agronomy or soil science.

The Plan A (thesis) program is for M.S. candidates. A minimum of 21 course credits is required, including a minimum of 12 credits, in courses numbered 600-799. No more than 2 credits in directed research (Agronomy 699, Soil Science 699) may be allowed toward the degree under this plan.

The agronomy option allows the use of Plan B only by students accepted as intended candidates for the Ph.D. directly from the B.S. degree. Upon completion of their course requirements, such students will be required to present a seminar at which time the program committee will decide (a) whether the student passes or fails, and (b) if he passes whether he will be allowed to continue for the Ph.D.

The Plan C option is limited to superior students. Selection of candidates will be based upon their pre-

vious academic records, an interview, and level of performance in the general examination. The student will be required to take courses, present reports and to take examinations as outlined by the program committee. Upon completion of program requirements the student will be required to take a written and oral final examination. The program committee will then decide (a) if the student passes or fails and (b) if he passes whether or not he will be allowed to continue for the Ph.D. in agronomy and soil science.

The degree of Ph.D. in agronomy and soil science is awarded only for distinguished scholarly achievement. The dissertation, which is a significant original contribution of basic knowledge in the candidate's field, is required. Only students with superior academic records in predoctoral programs will be accepted into the program. For the soil science option, mathematical preparation at least to the level of differential and integral calculus is strongly recommended.

Ph.D. candidates will be required to take a predoctoral qualifying examination similar in nature to the general examination taken by all candidates for the M.S. degree. If the intended candidate receives his M.S. from this department, then his M.S. committee will decide whether or not he may be accepted as an intended Ph.D. candidate. The committee will further decide if such intended candidate will be required to take the qualifying examination.

**Language Requirement:** One of the requirements for Ph.D. degree candidates in the field of agronomy and soil science will be knowledge of two or more languages, one of which must be English. When the additional language is not the student's native tongue, the language requirement may be fulfilled by either:

- (1) Completion with a passing grade of two semesters of a foreign language as taught by the University of Hawaii language department (either European or Asian and Pacific languages) or
- (2) Transfer of credits equivalent to (1) above from another institution, or
- (3) Demonstration of competence equivalent to completion of the first two semesters of foreign language at the University of Hawaii as determined by the language department credit-by-examination procedures.

Subsequently, they will be required to take written and oral comprehensive examinations and a final oral examination which will include a public defense of the dissertation. All Ph.D. candidates must register for seminar in agronomy or soil science.

Courses in the major field are to be selected from those listed below. Supplementary courses in related fields will be required as determined by the area of specialization. Those in the agronomy option may specialize in tropical crop production, crop physiology, plant breeding, cytogenetics, pasture management, or plant-soil relationships. In the soil science option students may specialize in tropical soil genesis and characterization, soil chemistry, soil physics, soil mineralogy, soil fertility, soil salinity or soil management.

AGRONOMY (Agron)  
 310 Tropical Crop Production (3)  
 402 Tissue Culture (3)  
 411 Sugar Cane Agronomy (3)  
 412 Pineapple Culture (2)  
 413 Pasture Management (3)  
 610 Physiology of Crop Production (3)  
 651 Advanced Techniques in Plant and Soil Analysis (3)  
 699 Directed Research M.S. (v.)  
 701 Seminar in Advanced Agronomy (1)  
 710 Mineral Nutrition of Tropical Crops (2)  
 799 Directed Research Ph.D. (v.)  
 800 Thesis Research (v.)

SOIL SCIENCES (Soils)  
 404 Soil Microbiology (3)  
 440 Soil Salinity and Irrigation Water Quality (3)  
 460 Soil Physics (3)  
 461 Soil Erosion: Causes and Controls (3)  
 470 Tropical Soil Survey and Interpretation (2)  
 640 Advanced Soil Chemistry (3)  
 650 Advanced Soil Fertility (4)  
 661 Meteorology in Agriculture (3)  
 670 Soil Formation and Classification (4)  
 671 Soil and Clay Mineralogy (3)  
 699 Directed Research M.S. (v.)  
 704 Seminar in Advanced Soil Science (1)  
 799 Directed Research Ph.D. (v.)  
 800 Thesis Research (v.)

## American Studies

### Graduate Faculty

S. Lutzky, Ph.D. (Chairman)—history and social backgrounds  
 S. Brown, Ph.D.—politics and history of ideas  
 R. Denney, B.A.—literature and sociology  
 J. Gurian, Ph.D.—literature and social problems  
 F. Matson, Ph.D.—politics and social science  
 J. McCutcheon, Ph.D.—social and cultural history  
 J. Neil, Ph.D.—cultural history and art

### Cooperating Faculty

J. T. Araki, Ph.D.—Japanese language  
 B. O. Campbell, Ph.D.—economics  
 R. H. Canary, Ph.D.—American literature  
 A. M. Keppel, Ph.D.—education  
 H. F. Margulies, Ph.D.—history  
 G. D. Paige, Ph.D.—political science  
 R. L. Rapson, Ph.D.—history  
 F. W. Riggs, Ph.D.—political science  
 R. K. Sakai, Ph.D.—history  
 W. F. Vella, Ph.D.—history  
 A. M. Whitehill, Ph.D.—international management

The American studies department offers a graduate program designed as a multidisciplinary and cross-cultural approach to the study of problems in American life. Taking advantage of the location of the University, library resources and faculty interests, the department places a special emphasis on the problems shared by the U.S. with Asian nations and cultures.

Recognizing the unique nature of the program and the difficulties of adequate undergraduate preparation, especially for students from Asian countries, departmental requirements for intended candidates are flexible. Candidates should present a record indicating a wide range of study in the humanities and the social sciences or be willing to undertake additional courses or



readings in those fields before acceptance as degree candidates. The G.R.E. aptitude scores are required before requests for admission to either the M.A. or Ph.D. programs are considered by the department. No general examination is required.

Intended candidates for the M.A. degree may select either the Plan A (thesis) or the Plan B (nonthesis) programs. For either program candidates are required to take 15 semester credits in American studies courses, including American Studies 701-702. In addition, candidates should undertake a balanced program of courses in the fields of the humanities and the social sciences. Candidates under Plan A should include a minimum of 12 semester hours and under Plan B, 18 semester hours of courses in the fields of the humanities and the social sciences. An oral examination covering the thesis only is required of Plan A candidates. Plan A candidates will receive 6 credit hours for their thesis work. The mandatory requirement for American Studies 701-702 is in place of the final examination requirement for both Plan A and B.

Intended candidates for the Ph.D. degree are expected to possess the M.A. degree in American studies or its equivalent. An applicant should have a scholarly attainment of an unusually high order to work within a multidisciplinary program and both written and oral preliminary examinations will be required. The program of study will not require a specific group of courses other than four seminars, American Studies 711-714. The seminars will cover four fields in American civilization and the examinations given at their conclusion will be considered as part of the preliminary examinations. Candidates will be admitted into the seminars only after the advisory committees have agreed that candidates have completed their individually planned prerequisites of other courses and readings. The language requirements for admission to candidacy will be the minimum requirements set by the Graduate Division unless the candidate's advisory committee sets additional requirements.

American candidates having a special career interest in Asia may obtain the certificate offered by the Overseas Career Program in conjunction with the degree in American studies.

#### AMERICAN STUDIES(AmSt)

- 370 Music in Modern America (3)
- 390 Introduction to Contemporary America (3)
- 435 Radical Tradition in America (3)
- 460 Myths in American Development (3)
- 465 Popular Culture in America (3)
- 475 American Taste (3)
- 480 Foreign Policy and the American Personality
- 485-486 Contemporary American Civilization (3)
- 490 Special Topics (3)
- 495 Black Americans and American National Character (3)
- 615 Leaders and Movements in American Thought (3)
- 621 The West in the American Consciousness (3)
- 631 Mass Media in American Society (3)
- 635 Perspectives in Comparative Literature (3)
- 641 Asian Influences in American Civilization (3)
- 650 American Civilization and the Overseas American (3)
- 665 Seminar: Presidential Leadership & American Civilization (3)

- 670 Seminar: Sociability in the United States (3)
- 672 Environmental Design in Hawaii (3)
- 701-702 Proseminar—M.A. (3-3)
- 711 American Representative Institutions (3)
- 712 American Beliefs (3)
- 713 American Technology and Society (3)
- 714 American Arts and Society (3)
- 750 Seminar in the Interaction of Asia and America (3)
- 799 Directed Research (v.)
- 800 Thesis Research

#### Anatomy

##### Graduate Faculty

- V. J. DeFeo, Ph.D. (Chairman)—embryo-uterine relationships, endocrinology and physiology of reproduction, electron microscopy, human sexuality
- M. Diamond, Ph.D.—sex behavior, human sexuality, endocrinology of reproduction
- R. G. Kleinfeld, Ph.D.—cellular and developmental biology, cytochemistry, electron microscopy
- J. C. Hoffmann, Ph.D.—control of reproductive cycles, endocrinology of reproduction
- R. Yanagimachi, Ph.D.—sperm capacitation, ovum fertilization
- R. J. Teichman, Ph.D.—comparative sperm morphology, biological membranes, electron histochemistry

Only the M.S. degree is offered at present. It is hoped that the Ph.D. program may become available in a few years. The thesis research in which students participate relates to the subject of reproductive biology in mammals, including humans (the department of anatomy has a close working relationship with the section of obstetrics and gynecology). All research programs are multidisciplinary and involve not only the biological structures relating to reproduction but also their biochemical and physiological aspects. This approach will also be reflected in the planning of a student's curriculum by the faculty. The department also maintains a strong interest in sex behavior and human sexuality. Excellent, well-equipped facilities exist for both the teaching and research programs including two modern electron microscopes. The courses which are available are listed below and a description of their contents can be found in the *Medical School Bulletin*.

#### ANATOMY (Anat)

- 602 Functional Human Anatomy (6)
- 628 Mechanisms of Gamete Interaction (2)
- 632 Reproduction and Sexuality (2)
- 634 Experimental Methods in the Study of Reproductive Behavior (v.)
- 699 Directed Research (v.)
- 800 Thesis Research (v.)

In addition to the specific courses above, the department of anatomy is strongly involved in the following interdisciplinary *biomedical* courses at the graduate level.

#### BIOMEDICAL SCIENCE (Biomed)

- 601 Cell Structure and Function (3)
- 602 Endocrinology and Reproduction (3)
- 603 Organ Structure and Function (7)
- 604 Neuroscience (4)

## Animal Sciences

### Graduate Faculty

- R.W. Stanley, Ph.D. (Chairman)—nutrition  
 C.C. Brooks, Ph.D.—swine nutrition  
 R.B. Herrick, Ph.D.—poultry physiology  
 J.H. Koshi, Ph.D.—dairy science  
 R.M. Nakamura, D.V.M., Ph.D.—animal diseases  
 A.L. Palafox, Ph.D.—poultry nutrition  
 E. Ross, Ph.D.—poultry nutrition  
 D.W. Vogt, Ph.D.—animal breeding and quantitative genetics  
 O. Wayman, Ph.D.—general physiology and physiology of reproduction

The M.S. in animal sciences is offered in the fields of genetics, nutrition, animal diseases, and physiology. Strong training in chemistry, physics, and mathematics is desirable with emphasis depending upon the field of specialization. Candidates wishing to specialize in nutrition, animal diseases, or physiology should be strong in chemistry and physics with a good background in mathematics. Candidates wishing to specialize in animal breeding or quantitative genetics should be particularly strong in mathematics with a good biological background.

Thesis research is required for animal sciences graduate students and carries 12 credits.

### ANIMAL SCIENCES(AnSc)

- 442-443 Physiology of Domestic Animals (4-4)  
 444 Animal Nutrition (4)  
 445 Animal Breeding (3)  
 446 Animal Diseases and Their Control (3)  
 641 Seminar in Animal Sciences (1)  
 642 Ruminant Nutrition (2)  
 643 Physiology of Reproduction (3)  
 652 Quantitative Genetics (3)  
 699 Directed Research (v.)  
 800 Thesis Research (v.)

## Anthropology

### Graduate Faculty

- S.T. Boggs, Ph.D.—culture and personality, education and anthropology, methods  
 A.G. Dewey, Ph.D.—Indonesia, Polynesia, Melanesia; social anthropology, culture change  
 P. B. Griffin, Ph.D.—North America, Polynesia; archaeological theory, ecological anthropology  
 S.A. Howard, Ph.D.—Polynesia; social and psychological anthropology, ethnoscience  
 W.P. Lebra, Ph.D.—East Asia; social anthropology, religion  
 R.W. Lieban, Ph.D.—Philippines, Southeast Asia; social anthropology, medical anthropology  
 K.L. Luomala, Ph.D.—Polynesia and Micronesia; ethnology and folklore  
 F.J. Mahony, Ph.D.—Micronesia; applied anthropology, medical anthropology  
 T.W. Marezki, Ph.D.—East Asia; psychological and applied anthropology, culture change  
 D.L. Oliver, Ph.D.—Oceania; social anthropology  
 M. Pietrusewsky, Ph.D.—physical anthropology  
 W.G. Solheim, Ph.D.—Southeast Asia; archaeology

### Affiliate Faculty

- G. Bateson, M.A.—Melanesia, Indonesia; culture and personality, communicational aspects of culture  
 K.E. Emory, Ph.D.—Polynesia; archaeology, ethnology  
 R.W. Force, Ph.D.—Oceania; culture change  
 Y. Sinoto, D.Sc.—Polynesia and Japan; archaeology  
 D. Yen—Oceania, Southeast Asia; ethnobotany

Intended candidates for the M.A. or Ph.D. need not have an undergraduate background in anthropology. All applicants must submit to the department Graduate Record Examination aptitude scores and three letters of recommendation at the time of application. Lack of previous training in anthropology may result, however, in study to fill gaps in knowledge. Such decisions will be taken by course instructors, who may set up appropriate admission requirements for their courses. The goal of the Ph.D. program is to allow early and intensive specialization within the field of anthropology and adequate comprehension of one field of specialization and related knowledge as a preparation for undertaking dissertation research. The specializations offered by the department are social and psychological anthropology, and archaeology. Cross-disciplinary specializations are welcomed, especially in such related fields as linguistics and human biology. Graduate programs are flexible and tailored to the interests of the individual student. Evaluation of the student's capacity to do graduate work will normally be carried out by the end of the first year. Students favorably evaluated will be admitted to candidacy for the M.A. or Ph.D.

### M.A.

The M.A. candidate has a choice of a thesis (Plan A) or a nonthesis (Plan B) program. Plan A consists of 24 semester hours of course work and a thesis worth an additional 6 hours. Plan B consists of 30 semester hours. Both require a minimum of 18 credits in graduate courses in anthropology. The course requirements should be met in a way which provides a broad knowledge of one sub-field of anthropology and an acquaintance with a second sub-field within anthropology or another discipline. The M.A. candidate who selects Plan A must pass a final oral examination. For candidates who select Plan B the final exercise will consist of an oral examination (or critical analysis) given by the committee, a presentation to a graduate seminar, and/or directed research papers written by the student after his admission to candidacy for the degree. The oral examination or other final exercise will assess the candidate's knowledge of one topic, possession of relevant information about one ethnographic area, and his understanding of the principles of research methods.

Attention is called to the fact that the M.A. program at present is modelled closely upon the Ph.D. program. Consideration is being given to M.A. programs designed for students in such applied fields as education, international programs, public health, and medicine. Students with interests in these fields are invited to discuss with the graduate program coordinator M.A. programs specifically designed for their needs.

**Ph.D.**

The Ph.D. program has no unit requirements apart from the Graduate Division requirement of three semesters of full-time work. No specific course is required. The student will work out with his advisory committee a program to accomplish the following goals: A broad knowledge of one sub-field of anthropology (biological anthropology, archaeology, linguistics, and social-cultural anthropology, the latter including psychological anthropology); an acquaintance with a second sub-field within anthropology or another discipline; deep and critical knowledge of the topic which is most relevant to the research which the student plans to carry out for the dissertation; pertinent information about one ethnographic area; knowledge of appropriate methods of analysis; and an acceptable dissertation proposal.

In order to develop a broad knowledge of one sub-field a student will take a regular graduate course or seminar from at least 4 different members of the department, and also some work in a second sub-field within anthropology or another discipline. Equivalent graduate study at another university can be substituted for these requirements with the approval of the student's advisory committee. Students will be encouraged to undertake faculty supervised research prior to submitting a dissertation proposal. Students who intend to teach introductory anthropology later in their careers will be encouraged to develop a broad acquaintance with the entire field of anthropology and to develop teaching abilities through practice.

Before undertaking dissertation research a student will submit a detailed proposal to his doctoral advisory committee. The committee may amend the proposal and suggest further ethnographic, theoretical, or methodological areas which the candidate should investigate. When the student and his committee are satisfied that he is fully prepared for his dissertation research the student will be given a comprehensive oral examination, which will ascertain the student's comprehension of the topics and areas defined as program goals above. This examination will be conducted by the student's doctoral advisory committee. All members of the department faculty are invited to attend. Upon submission of the final draft of his dissertation a candidate will, under present Graduate Division requirements, present an oral defense of the dissertation.

**ANTHROPOLOGY(Anth)**

- 300 Study of Contemporary Problems (3)
- 305 History of Anthropology (3)
- 306 Foundations of Anthropological Method (3)
- 310 Human Evolution (3)
- 320 Archaeological Theory and Interpretation (3)
- 330 Social Organization (3)
- 340 World Ethnography (3)
- 350 Oceania (3)
- 355-356 Asia (3-3)
- 370 Ethnographic Field Techniques (3)
- 380 Archaeological Field Techniques (3)
- 381 Archaeological Laboratory Techniques (3)
- 400 Anthropological Statistics (3)
- 415 Ecological Anthropology (3)
- 416 Economic Anthropology (3)
- 417 Political Anthropology (3)

- 418 Culture and the Individual (3)
- 419 Oral Art (3)
- 422 Comparative Religion (3)
- 423 Social and Cultural Change (3)
- 445 Regional Ethnology (3)
  - (1) Continental East Asia
  - (2) Mainland Southeast Asia
  - (3) Island Southeast Asia
  - (4) Micronesia
  - (5) Polynesia
  - (6) Melanesia
  - (7) Other to be announced
- 460 Regional Archaeology (3)
  - (1) Asia
  - (2) Europe, Africa, and Near East
  - (3) North and South America
  - (4) Other to be announced
- 480 Anthropological Applications (3)
  - (1) Development
  - (2) Health
  - (3) Education
- 481 Applied Anthropology (3)
- 483-484 Japanese Culture and Behavior (3-3)
- 485-486 Peoples of Hawaii (3-3)
- 620 Theory in Social and Cultural Anthropology (3)
  - (1) Kinship
  - (2) Cognitive Systems
  - (3) Religion
  - (4) Political Institutions
  - (5) Law and Social Control
  - (6) Economics
  - (7) Ecology
  - (8) Other to be announced
- 630 Theory in Physical Anthropology (3)
- 635 Culture History (3)
- 640 Method and Theory in Archaeology (3)
  - (1) Prehistory
  - (2) Environmental Archaeology
  - (3) Other to be announced
- 699 Directed Reading or Research (v.)
- 710 Seminar in Research Methods (3)
- 712 Data Processing in Archaeology (3)
- 750 Research Seminar (3)
  - (1) Archaeology
  - (2) Linguistics
  - (3) Ethnography
  - (4) Social Anthropology
  - (5) Psychological Anthropology
  - (6) Biological Anthropology
- 800 Thesis Research (v.)

38

**Architecture**

*Graduate Faculty*

- H. Burgess, M.S. Arch.—architectural design, perception and behavior
- B. Etherington, B. Arch.—tropical architecture and development studies
- L. Minerbi, Dott. Arch., MUP—urban/regional design and planning
- D. Terazaki, M.E.—architectural engineering and technology
- E. Toth, M.S.—structural engineering and computer applications
- J. Utzon, B. Arch.—architectural design and theory

*Affiliate Faculty*

- T. Creighton, B.A.—architectural and planning theory
- F. Haines, M. Arch.—professional architecture practice
- W. Merrill, M. Arch.—urban/regional design
- R. Preuss, B. Arch., MUP—urban design and planning

The professional degree of M. Arch. in architecture is designed to provide intensive professional study and to meet the criteria of professional licensing boards. At the same time an opportunity to elect courses from other departments and colleges within the University encourages integration of architecture with other disciplines and provides a broad social and technical curriculum. Emphasis areas are: architectural design, architectural engineering and technology, urban/ regional design, and tropical and development studies. Requirements for graduation are completion of 30 credit hours of course work and 6 credit hours of thesis research. See department bulletin for detailed requirements.

Candidates for the Master's degree in architecture are accepted from three categories.

1. Holders of bachelor's degrees in a major other than architecture. Such students are required to complete 65 credits of undergraduate architectural preparatory work before becoming candidates.
2. Holders of a bachelor's degree in pre-architecture or an equivalent pre-professional degree. These students are required to complete 28 credits of post-graduate architectural preparatory work before becoming candidates.
3. Holders of a five-year B.Arch. degree or equivalent. These students are admitted immediately to candidacy.

Applicants under categories 2 and 3 noted above must when applying to the Graduate Division, simultaneously submit to the department of architecture: (a) indication of major area of study: architectural design, architectural and environmental engineering, urban/regional design, or tropical and development studies. (b) Samples of work done in intended major; e.g., colored transparencies, or black and white photographs in brochure form. Brochures should not exceed 12 by 18 inches. Brochures will be returned by mail only if sufficient postage is included.

In addition to meeting departmental and Graduate Division academic requirements and prior to admission to candidacy, applicants are required to submit documented evidence of completion of 600 hours of supervised work in the offices of practicing architects, architectural engineers, landscape architects, urban/regional designers and/or planners.

#### ARCHITECTURE(Arch)

- 400 Special Projects in Architecture (v.)
- 401 Architectural Structures "D" (4)
- 402 Architectural Structures "E" (4)
- 411 Building and Zoning Codes (3)
- 412 Working Drawings, Estimating and Specifications (3)
- 421 Environmental Control (3)
- 431 Architectural Design "D" (4)
- 432 Architectural Design "E" (4)
- 441 Strategy in Urban & Regional Design (4)
- 442 Methods of Urban & Regional Design (4)
- 471 Environmental Psychology (3)
- 476 Architectural Archetypes (3)
- 477 Research Seminar (v.)
- 488 Design Internship (v.)
- 496 Field studies (v.)

- 601 Architectural Kinetics (4)
- 616 Professional Practice (3)
- 621 Seminar on Tropical Architecture (3)
- 640 Architecture and Planning in Tropical Areas (4)
- 671 Advanced Environmental Psychology (3)
- 672 Environmental Design in Hawaii (3)
- 699 Directed Work (v.)

## Art

### Graduate Faculty

- C.W. Anderson, M.A.—painting, design
- K. Bushnell, M.F.A.—painting
- J.H. Cox, M.A.—painting, Oceanic art
- B. Ecke, M.A.—Chinese art
- M. Havaas, M.F.A.—textile design
- C.F. Horan, M.A.—ceramics
- S. Kimura, M.F.A.—painting
- K.G. Kingrey, M.A.—design
- R. Kowalke, M.F.A.—printmaking
- H.O. McVay, M.A.—ceramics
- P. Neogy, M.A.—Asian art
- B. Norris, B.A.—painting
- H.A. Robinson, M.A.—weaving
- M. Sato, M.F.A.—sculpture
- E. Stasack, M.F.A.—painting, printmaking
- M. Turnbull, M.A.—painting
- C. Weber, Ph.D.—Japanese art
- J. Wisnosky, M.F.A.—painting

### Visiting Artists in residence arranged

The M.A. is given in the fields of Asian and Pacific art history. Intended candidates must present the equivalent of an undergraduate major in the history of art including 24 credits in art history and related courses, and, in addition to English, a reading knowledge of one language in which a considerable body of relevant literature is published. Art 384, 385, 391 or the equivalent may be required of transfer students as prerequisites to work towards the M.A. The faculty will determine the suitability of Plan A or Plan B at the preliminary conference. The history of art as well as the studio programs are concerned with the creative, the experiential and the developmental aspects of art.

The M.F.A. (Plan A only) is a terminal degree in creative studio work in the visual arts. As such, it is closer to the Ph.D. in character than to the M.A. 48 credit hours are required. Students accepted to candidacy before September 1970 may elect to transfer to the extended program or may continue under the old requirements.

Studio specialization is required in a selected area. Course work includes a minimum of 18 credits in studio and 6 credits in thesis which includes an exhibition of original work in the chosen medium. Intended candidates must present the equivalent of an undergraduate major in art including 18 credits in art history and theory. Evidence of ability to do creative work of superior quality must be presented by means of a portfolio or slides.



In view of the intensive character of the program of professional studies in art, students who are admitted to the Graduate Division with a B.A. or B.S. degree are required to complete work which is comparable to that of a bachelor of fine arts degree or its equivalent before admission for the master of fine arts degree. Ordinarily this will not exceed two semesters of study.

An otherwise deficient or incompatible undergraduate program will require at the discretion of the graduate faculty, additional course work for either degree. The M.F.A. will require a minimum of two years of study for a well-qualified candidate.

Courses available for the graduate program are listed below. For the M.A. a maximum of 9 hours may be earned in appropriate advanced courses in other departments as approved by the graduate adviser. For the M.F.A. degree elective courses may be in any art department program or any academic department of the University approved by the graduate adviser.

For the M.F.A., Art 699 Directed Work, may be taken for not more than 3 credits per semester for a total of 12 credits maximum of the 48 required.

Art courses which qualify for a graduate degree may be taken in any area of specialization for which adequate preparation is demonstrable, subject to consent of instructor and graduate adviser.

#### ART(Art)

- 384 Art of Japan and Korea (3)
- 385 Art of China (3)
- 391 Art of South Asia (3)
- 400 Special Projects in Art (v.)
- 401 Glass Blowing (3)
- 402 Glass Blowing (3)
- 407 Advanced Photography (3)
- 463-464 Visual Communication (3-3)
- 470 Renaissance Art (3)
- 471 Baroque and Rococo Art (3)
- 472 American Art (3)
- 473 Contemporary Art (3)
- 474 Arts of the 20th Century (3)
- 475 Arts of the Pacific (3)
- 476 Primitive Art (3)
- 477 Primitive Art of the Pacific Rim (3)
- 478 Arts of Melanesia (3)
- 483 Applied Arts of Japan (3)
- 485 Applied Arts of China (3)
- 491 Art of Islam (3)
- 495 Art of Southeast Asia (3)
- 496 Art and Architectural Field Studies (v.)
- 617 Printmaking (3)
- 624 Painting (3)
- 630 Textile Design (3)
- 638-639 Weaving (3-3)
- 646 Ceramics (3)
- 647 Ceramics (v.)
- 648 Ceramic Glazes and Clay Bodies (3)
- 649 Ceramics (3)
- 653 Graduate Sculpture (v.)
- 665 Advanced Typography (3)
- 675 Arts of Hawaii (3)
- 677 Tribal Arts of Indonesia and South Asia (3)
- 685 Early Chinese Painting (3)
- 686 Later Chinese Painting (3)
- 691 Art of Central Asia (3)
- 699 Directed Work (v.)
- 773-774 Visual Design Research (v.)
- 780 Japanese Sculpture (3)
- 781 Japanese Painting (3)
- 791 Buddhist and Hindu Art (3)

## Asian Languages

### Graduate Faculty

- J. DeFrancis, Ph.D. (Chairman)—Chinese: applied linguistics, civilization  
 J.T. Araki, Ph.D.—Japanese: literature  
 R.M. Baumer, Ph.D.—Indic languages  
 R.L. Cheng, Ph.D.—Chinese and Japanese: linguistics  
 S. Dardjowidjojo, Ph.D.—Indonesian: linguistics  
 N. Fujioka, M.A.—Japanese: classical and modern grammar  
 T.W. Gething, Ph.D.—Thai: linguistics  
 H. Ikeda, Ph.D.—folklore: Japanese bibliography and literature  
 P. Jenner, Ph.D.—Cambodian: linguistics and literature  
 Y. Kusanagi, Ph.D.—Japanese: linguistics  
 P.H. Lee, Ph.D.—East Asian comparative literature  
 F.K. Li, Ph.D.—Chinese and Thai: linguistics  
 Y.C. Li, Ph.D.—Chinese: linguistics  
 N.D. Liem, Ph.D.—Vietnamese: linguistics  
 C.T. Lo, Ph.D.—Chinese: folklore and traditional literature  
 W.H. Maurer, Ph.D.—Sanskrit: literature  
 H. Taylor, Ph.D.—Japanese: linguistics  
 V.H. Viglielmo, Ph.D.—Japanese: modern literature and thought  
 L.P.H.C. Winters, M.A.—Chinese: classical poetry and modern literature  
 J. Young, Ph.D.—Japanese and Chinese: applied linguistics, civilization

Intended candidates for the M.A. or Ph.D. in Asian languages must present a minimum background equivalent to a strong undergraduate major in the language. Those not fulfilling this requirement may be admitted to candidacy only under the condition that they make up their deficiencies as early as possible. Aptitude Test of GRE is required with application for admission.

### M.A.

The M.A. degree is offered in Chinese and Japanese. Both Plan A (thesis) and Plan B (nonthesis) programs in each of the following major concentrations are available: Chinese (1) language, (2) literature, and (3) teaching Chinese as a second language (CHISL); Japanese (1) language, (2) literature, and (3) teaching Japanese as a second language (JASL).

Under Plan A (thesis) a minimum of 21 hours of course work, including at least 18 credit hours in the major field, plus 9 hours of thesis research is required. A minimum of 12 credits in the major field must be earned in courses numbered 600 or higher including the graduate seminar, Chinese or Japanese 750.

Under Plan B (nonthesis), a minimum of 30 hours of course work, including at least 21 hours in the major field, is required. A minimum of 18 credits in the major field must be earned in courses numbered 600 or higher including the graduate seminar, Chinese or Japanese 750.

Intended candidates must have a B.A. in Chinese or Japanese or have had equivalent preparation in the discipline. Additional details regarding the program may be found in separate departmental circulars summarizing the prerequisites, required courses, and suggested electives for each of these fields.

### Ph.D.

A Ph.D. degree is offered in Asian languages with emphasis on Japanese. There are four major areas in which candidates for the Ph.D. may work: Classical-Medieval Japanese, Edo Japanese, Modern Japanese, and History of the Japanese Language. The doctoral candidate is expected also to have two minor fields of study to be selected in consultation with his advisers. Suggested fields include Japanese art, Japanese or East Asian philosophy, Asian drama and theater, general linguistics, history of China, Korean language and literature, and Western literature.

Prospective candidates will be formally advanced to candidacy upon passing qualifying examinations. They must pass a comprehensive examination and a final oral examination in defense of the dissertation. Apart from having a command of English and Japanese, candidates must be proficient in a foreign language—normally French or German—in which there is considerable literature pertinent to their areas of concentration, and must also acquire a basic competence in classical Chinese.

### CHINESE

- Language:(Chnse)  
 401-402 Fourth-Level Chinese (4-4)  
 404 Accelerated Fourth-Level Chinese (8)  
 421-422 Advanced Chinese Conversation (3-3)  
 433-434 Selected Readings in Chinese (3-3)  
 435-436 Introductory Classical Chinese (3-3)  
 437-438 Advanced Classical Chinese (3-3)  
 440 Chinese Composition (2)  
 451-452 Structure of Chinese (3-3)  
 470 Language and Culture of China (3)  
 490 Reference Materials for Chinese Studies (1)  
 631 Chinese Phonology (3)  
 632 Chinese Dialects (3)  
 641-642 Contrastive Analysis of Mandarin and English Structure (3-3)  
 643-644 Methodology in Teaching Chinese as a Second Language (3-3)  
 693-694 Methods in Chinese Studies (3-3)  
 750.2 Research Seminar in Chinese—Language (3)  
 750.3 Research Seminar in Chinese—Teaching Methods (3)  
 800 Thesis Research (v.)  
 690 Directed Reading—Chinese (v.)  
 699 Directed Research (v.)

### Literature:(ChLit)

- 461-462 Introduction to Modern Chinese Literature (3-3)  
 611-612 Contemporary Chinese Literature (3-3)  
 613-614 Chinese Poetry (3-3)  
 616 History of Chinese Literary Criticism (3)  
 617 Traditional Chinese Fiction (3)  
 618 Traditional Chinese Drama (3)  
 750 Research Seminar in Chinese—Literature (3)  
 800 Thesis Research (v.)  
 690.1 Directed Reading—Chinese (v.)  
 699 Directed Research (v.)

### JAPANESE

- Language:(Jpnse)  
 400 Intensive Advanced Japanese (16)  
 401-402 Fourth-Level Japanese (4-4)  
 404 Accelerated Fourth-Level Japanese (8)  
 411-412 Advanced Japanese Aural Comprehension (3-3)  
 421-422 Advanced Japanese Conversation (3-3)  
 431-432 Selected Readings in Japanese (3-3)



- 435-436 Introduction to Japanese Documentary and Epistolary Styles (3-3)  
 440 Advanced Japanese Composition (2)  
 451-452 Structure of Japanese (3-3)  
 455-456 Topics in Japanese Grammar (3-3)  
 457-458 Japanese Grammar: Classical (3-3)  
 470 Language and Culture of Japan (3)  
 490 Reference Materials for Japanese Studies (3)  
 491-492 Japanese Interpretation (3-3)  
 495-496 Japanese Translation (3-3)  
 631-632 History of Japanese Language (3-3)  
 641-642 Contrastive Study of Japanese and English Structure (3-3)  
 643-644 Methodology in Teaching Japanese as a Second Language (3-3)  
 750.1 Research Seminar in Japanese—Language (3)  
 750.2 Research Seminar in Japanese—Teaching Methods (3)  
 800 Thesis Research (v.)  
 690 Directed Reading—Japanese (v.)  
 699 Directed Research (v.)

## Literature:(JaLit)

- 461 Introduction to Modern Japanese Literature (3)  
 462 Introduction to Traditional Japanese Literature (3)  
 609-610 Japanese Poetry (3-3)  
 611-612 Contemporary Japanese Literature (3-3)  
 614 Edo Literature (3)  
 615 Medieval Japanese Literature (3)  
 616 Classical Japanese Literature (3)  
 621-622 History of Japanese Literary Criticism (3-3)  
 623 Japanese Folklore (3)  
 690 Japanese Bibliography (3)  
 750 Research Seminar in Japanese—Literature (3)  
 800 Thesis Research (v.)  
 690 Directed Reading—Japanese (v.)  
 699 Directed Research (v.)  
 761-762 Seminar in East Asian Comparative Literature (3-3)

## Asian Studies

### Graduate Faculty

- D.W.Y. Kwok, Ph.D. (Director)—history  
*East Asia*  
 F.C. Hung, Ph.D. (Chairman)—economics  
*Southeast Asia*  
 W.F. Vella, Ph.D. (Chairman)—history  
*South Asia*  
 B. Stein, Ph.D. (Chairman)—history

The graduate program in Asian studies is designed primarily for students who have taken their B.A. in a discipline and who wish to study a particular geographical and cultural region of Asia at the M.A. level. Such an approach entails studying the region through at least two disciplinary viewpoints. The program is open also to Asian nationals provided they concentrate their study upon an area not native to them. The master's degree is the terminal degree in Asian studies; this degree is offered only under Plan B, which is a nonthesis program.

Graduate work in Asian studies is supervised and coordinated by three respective area studies committees for East Asia, Southeast Asia, and South Asia.

Students not having sufficient academic background for the study of Asia may be required to take, without credit toward the degree, certain preparatory courses designated by their respective area committee. Atten-

tion is drawn to the language requirement listed below. Graduate Record Examination scores for aptitudes are also required for admission to the program, but advanced test scores are not required.

Requirements for the M.A. in Asian studies include:

- (1) a concentration and completion of 15 hours of courses approved by the area adviser in consultation with the pertinent department in one of the following disciplines: anthropology, economics, geography, history, political science, philosophy, and sociology;
- (2) a minimum of 6 hours of Asian courses outside the field of concentration;
- (3) a multidisciplinary graduate Asian studies seminar offered by the area program committees, to be taken towards the end of the candidate's degree program;
- (4) a minimum of 6 hours of credit in an Asian language at the fourth-level or higher; entering students who have achieved this level and can demonstrate this proficiency through examination, may select alternate courses equalling 6 credits with the consent of their area committee adviser;
- (5) submission of a major seminar paper to the appropriate area committee for consideration as partial fulfillment of the M.A. degree.

## ASIAN STUDIES(Asian)

- 601 Contemporary Chinese Studies Seminar (3)  
 603 Contemporary Japanese Studies Seminar (3)  
 750 Seminar in Asian Studies (3)  
     (1) East Asian Studies  
     (2) Southeast Asian Studies  
     (3) South Asian Studies  
 799 Directed Research (v.)

## Astronomy

### Graduate Faculty

- J.R. Holmes, Ph.D. (Chairman)—optics spectroscopy  
 A.M. Boesgaard, Ph.D.—stellar spectroscopy  
 W.K. Bonsack, Ph.D.—stellar spectroscopy  
 J.T. Jefferies, D.Sc.—solar physics, radiation transfer  
 F.Q. Orrall, Ph.D.—solar physics  
 W.M. Sinton, Ph.D.—planetary and infra-red astronomy  
 R.D. Wolstencroft, Ph.D.—interplanetary and interstellar matter  
 J.B. Zirker, Ph.D.—solar physics

Undergraduate preparation for admission to the graduate program in astronomy includes a minimum of 35 semester hours of undergraduate credits in physics or astronomy, some of which must be in atomic and nuclear physics, electro-magnetism, mechanics, optics, and thermodynamics. An undergraduate course in introductory astronomy is recommended. Courses in mathematics through differential equations are also required. Applicants for admission must submit to the department aptitude and advanced (physics) scores of the Graduate Record Examination. M.S. must be completed before Ph.D. is attempted.

Courses in astronomy available for the graduate pro-

gram are listed below. Courses required for the M.S. degree in astronomy are marked with an asterisk. In addition Physics 600 and 610 are required. While no additional courses are required for the Ph.D., the student's adviser may recommend additional courses to ensure adequate background.

#### ASTRONOMY(Astr)

- \*621 Stellar Atmospheres I (3)
- 623 Stellar Interiors and Evolution (3)
- \*627 Galactic Structure I (3)
- \*629 Astrophysical Techniques (3)
- 724 Solar Physics (3)
- 725 Planetary Physics (3)
- 732 Astrophysical Spectra (3)
- 733 Special Topics in Astronomy (3)

### Biochemistry and Biophysics

#### Graduate Faculty

- L.H. Piette, Ph.D. (Chairman)—mechanisms of organic and biological reactions, electron paramagnetic resonance
- I.R. Gibbons, Ph.D.—cytology, electron microscopy
- F.C. Greenwood, Ph.D.—biochemical endocrinology; metabolism of protein hormones
- M. Mandel, Ph.D.—physiology of temperate bacteriophage; nuclear magnetic resonance
- J.A. Mann, Ph.D.—biomembrane dynamics, structure and function; surface physics and chemistry; theoretical chemistry (joint appointment with Chemistry)
- J.D. McConn, Ph.D.—enzyme kinetics and the catalytic function of metals
- B. McConnell, Ph.D.—structure of nucleic acids
- R.H. McKay, Ph.D.—physical biochemistry, biological oxidations
- B.E. Morton, Ph.D.—ribosomal structure and function
- H.F. Mower, Ph.D.—biological nitrogen fixation; hydrogenase enzymes; energy transfer mechanisms
- K.T. Yasunobu, Ph.D.—relationship of enzyme structure to function

#### Affiliate Faculty

- R.M. Heinicke, Ph.D.—enzymology, nutrition, plant biochemistry
- L.G. Nickell, Ph.D.—physiology and biochemistry of sugar cane

The M.S. (Plans A and B) and Ph.D. degrees are offered in both biochemistry and biophysics. The following information supplements the general requirements and procedures listed by the Graduate Division. The department requires all candidates to submit results of the Graduate Record Examination. Acceptance for graduate work by the department will admit the student to candidacy for the M.S. degree. A final written examination for the M.S. degree is required for both Plan A (thesis) and Plan B (nonthesis) students. For the M.S. degree, Plan A, the thesis will be examined by a thesis committee but no oral examination will be given. The number of units of course work are those required by the University—Plan A—30 credit hours—a minimum of 18 credit hours of course work and 12 credit hours of thesis research. For the M.S. degree, Plan B, nonthesis, the number of credits of course work are those required by the University, 30 graduate credit hours.

A written qualifying examination covering courses

601, 602 and 611 in general biochemistry and 601, 602 and 603 in biophysics is required for the Ph.D. degree before the student may continue to the comprehensive examination and then to enrollment in Thesis Research 800.

The qualifying examination is normally offered at the end of the second semester. Students joining the department with an M.S. degree may, on request, take the qualifying examination at time of entrance. Success in the biochemistry and/or biophysics section will credit the students with the relevant courses.

The comprehensive examination will take the form of an oral examination by the candidate's doctoral committee based on two original research propositions and a thesis outline submitted by the candidate. The final oral examination in defense of the dissertation follows University regulations. To facilitate matters for the candidate the doctoral committee will be kept informed as to the progress of the thesis research.

Further details may be obtained from the Prospectus for Graduate Training and Guide for Incoming Ph.D. Candidates issued by the department.

Intended candidates must have or acquire adequate preparation in organic, physical, and analytical chemistry and mathematics and physics. They should consult with the department faculty in planning their curricula and in choosing appropriate courses offered by other departments such as microbiology, physiology, pharmacology, genetics, zoology, chemistry, mathematics and physics. The students may participate in research programs in the area of enzyme structure and mode of action, protein and hormone biosynthesis, virus and nucleic acid structure, studies on the genetic mechanisms, bioenergetics and applications of electron spin resonance to the elucidation of membrane structure, cancer and antibody-antigen interaction. Academic and industrial careers as well as service in government are available to graduates of this program. Available courses are listed below.

#### BIOCHEMISTRY(Bioch)

- 441 Basic Biochemistry (3)
- 442 Basic Biochemistry Laboratory (1)
- 601-602 General Biochemistry (3-3)
- 611 General Biochemistry Laboratory (2)
- 605-606 Medical Biochemistry (2-2)
- 705 Special Topics in Biochemistry (2)
- 710 Special Topics in Enzymology (2)
- 713 Advanced Enzyme Kinetics (2)
- 720 Bioenergetics (2)
- 730 Nucleic Acids and Viruses (2)
- 740 Advanced Protein Chemistry (2)
- 671 Seminar (1)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

#### BIOPHYSICS(Bioph)

- 601-602 Survey of Biophysics (3-3)
- 603 Biophysics Laboratory (3)
- 701 Molecular Structure and Function of Chromosomes (2)
- 703 Conformational Analysis of Biopolymers (2)
- 704 The Role of Free Radicals in Biological Systems (2)
- 705 Special Topics in Biophysics (2)
- 706 Molecular Structure and Function of Cell Organelles (2)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

**Botanical Sciences***Graduate Faculty*

E.K. Akamine—post harvest physiology, tropical fruits  
 M. Aragaki—fungus physiology, disease control  
 G.E. Baker—mycology, fungal ecology, medical mycology  
 I.W. Buddenhagen—phytobacteriology, ultrastructure  
 H.F. Clements—environmental physiology, crop-logging  
 B.J. Cooil—mineral nutrition, salt uptake, tree nutrition  
 M.S. Doty—marine ecology, productivity, algal systematics  
 D.J.C. Friend—quantitative growth, environmental physiology  
 J.E. Hunter—virology, general plant pathology  
 O.V. Holtzmann—nematology, general pathology  
 M. Ishii—virology  
 N.P. Kefford—hormonal regulation of development  
 W. Ko—soil microbiology  
 C.H. Lamoureux—comparative and developmental morphology, conservation  
 D.S. Meredith—epidemiology, aerobiology  
 D. Mueller-Dombois—tropical and pioneer ecology  
 S. Nakata—developmental physiology of tree crops  
 S.S. Patil—host parasite physiology, post-harvest pathology, fungus physiology  
 E.W. Putman—carbohydrate biochemistry, soil chemistry  
 Y. Sagawa—cytology, cytogenetics, orchid genetics  
 S.M. Siegel—exobiology, stress physiology and biochemistry  
 C.W. Smith—morphogenetic processes, environmental effects  
 W.L. Theobald—systematics of angiosperms  
 E.E. Trujillo—soil-borne diseases

*Affiliate Faculty*

W.J. Apt—nematology, pineapple diseases  
 R.S. Byther—soil-borne diseases  
 F.R. Fosberg—tropical ecology and systematics  
 B. Krauss—anatomy, ethnobotany  
 L.G. Nickell—physiology of sugar cane, tissue culture  
 K.G. Rohrbach—pineapple disease  
 P. van Royen—systematics of tropical species  
 G.W. Steiner—host parasite physiology  
 W.H. Wagner—systematics, ferns  
 C.A. Wismer—diseases of sugar cane

M.S. (Plans A and B) and Ph.D. degrees in botanical sciences are offered. At the discretion of a candidate and his committee the degree may have the subtitle of a subdiscipline, *e.g.*, Botanical Sciences (Plant Pathology).

Intended candidates must present a minimum of 18 hours of undergraduate credit in botanical sciences or in related biological or agricultural sciences. In addition, a basic preparation in the physical sciences and in expository writing in English are required. Applications for admission must include scores of the Graduate Record Examination for aptitudes. A study program to remedy deficiencies and to meet degree requirements will be determined by each candidate's committee through examination and continuing counsel.

Plan A (thesis) and Plan B (nonthesis) are separate M.S. programs with distinct purposes. Before admission to candidacy, the plan a candidate intends to follow must be declared and approved. Plan A is the usual program to be taken by candidates. Plan B is offered at the discretion of the graduate faculty for students who do not intend to make research in botanical sciences their profession. Plan B programs emphasize the technological aspects of the botanical sciences. For the M.S.

degree—Plan A, 12 credits shall be for thesis and a minimum of an additional 18 credits for courses approved by a candidate's committee are required. For the M.S. degree—Plan B, of the minimum of 30 credits required, 15 credits shall be earned in the major field, or an approved related field, in courses numbered 600-799. Of these credits, 6 must be for directed research in aspects of botanical sciences chosen by the candidate in consultation with his committee.

All students take a qualifying examination within their first two semesters in a degree program. A requirement of all degrees is the presentation of a seminar on the research undertaken as part of the degree program.

Within one year of declaring his intention to enter the Ph.D. program, a student takes a reading examination in a foreign language significant to his area of specialty. On passing this examination, the student is admitted to candidacy and completes a program of instruction specified by his committee, including the demonstration of a working knowledge of either a second foreign language or another tool subject, and a dissertation. The dissertation is expected to be an original contribution based on independent research. It is initiated by the preparation of a critical review of the literature which becomes the basis for a dissertation proposal. Dissertation research for the Ph.D. degree is done in an aspect of botanical sciences for which a member of the graduate faculty of the field will accept responsibility as committee chairman.

The comprehensive examination is oral or oral and written and is conducted by the candidate's committee plus any members of the graduate faculty who wish to attend. In addition to general botanical sciences, the candidate is examined in depth in areas of botanical sciences or related disciplines selected by the committee and approved by the graduate faculty. The final oral examination in defense of the dissertation consists of a public seminar and examination by the graduate faculty and dissertation committee.

Available courses are listed below.

## BOTANICAL SCIENCES

## Botany (Bot)

- 410 Plant Anatomy (3)
- 412 Microtechnique (3)
- 421 Developmental Biology (3)
- 430 Mycology (3)
- 435 Experimental Mycology (3)
- 436 Medical Mycology (3)
- 440 Environmental and Space Biology I (2)
- 450 Natural History of the Hawaiian Islands (2)
- 453 Physiological Ecology (4)
- 454 Vegetation Ecology (4)
- 461 Systematics of Vascular Plants (4)
- 470 Principles of Plant Physiology (4)
- 480 Phycology (3)
- 610 Botanical Seminar (1)
- 612 Advanced Botanical Problems (v.)
- 615 Morphology Seminar (2)
- 618 Cytology (3)
- 620 Origin, Evolution and Distribution of Flowering Plants (4)
- 631 Marine Phytoplankton (3)
- 640 Environmental and Space Biology II (v.)
- 650 Environmental Phytogeography (2)
- 651 Dynamics of Marine Productivity (3)

- 662 Advanced Taxonomy (4)
- 665 Nomenclature Seminar (2)
- 670 Plant Nutrition and Water Relations (3)
- 671 Energetics and Biosynthesis in the Plant Kingdom (3)
- 672 Techniques in Physiology (2)
- 673 Techniques in Physiology-Biochemistry (2)
- 675 Physiology Seminar (1)
- 681 Phycology-Chlorophyta (2)
- 682 Phycology-Phytoplankton (2)
- 683 Phycology-Myxophyta and Phaeophyta (2)
- 684 Phycology-Rhodophyta (2)
- 699 Directed Research (v.)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

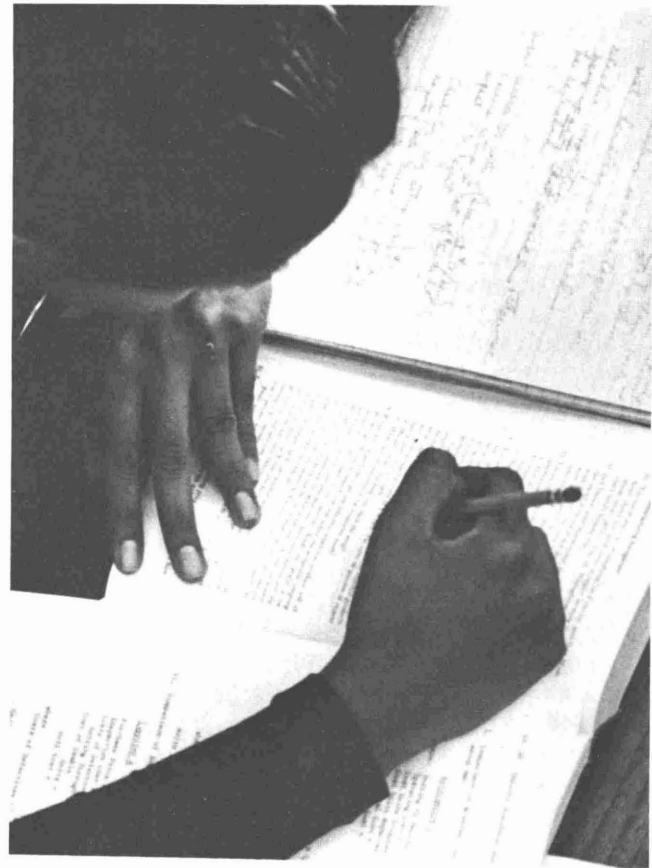
#### Plant Pathology (PPath)

- 411 Principles of Plant Pathology (4)
- 420 Biology and Ecology of Soil-Borne Plant Pathogens (3)
- 601 Tropical Plant Pathology (3)
- 605 Clinical Plant Pathology (2)
- 612 Principles of Plant Disease Control (3)
- 616 Plant Nematology (3)
- 621 Plant Pathology Techniques (3)
- 625 Advanced Plant Pathology (2)
- 630 Plant Virology (3)
- 635 Epidemiology of Plant Diseases (3)
- 660 Plant Pathology Seminar (1)
- 699 Directed Research (v.)
- 705 Host-Parasite Physiology (3)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

## Business Administration

### Graduate Faculty

- H.D. Lowe, D.B.A. (Chairman)—accounting
- J. Adler, Ph.D.—accounting, finance
- J.K. Bailey, Ph.D.—management
- R.E. Baird, Ph.D.—management, travel industry management
- E.M. Barnet, Ph.D.—management, marketing, travel industry management
- H.D. Bess, Ph.D.—transportation
- R.B. Buchele, Ph.D.—management
- A. Carol, Ph.D.—business economics and quantitative methods
- P.N.H. Chung, Ph.D.—business economics, statistics
- C.F. Congdon, M.B.A.—statistics
- D.A. Corbin, Ph.D.—accounting, finance
- M. Cotlar, Ph.D.—management
- L.J. Crampon, M.B.A.—travel industry management
- E.M. Currie, Ph.D.—accounting
- E.W.J. Faison, Ph.D.—marketing
- J.B. Ferguson, Ph.D.—personnel management, industrial relations
- L.P. Freitas, Ph.D.—finance
- C. Gee, M.A.—travel industry management
- T.Q. Gilson, Ph.D.—management, industrial relations
- R.C. Hook, Ph.D.—marketing
- M.E. Hopkins, Ph.D.—personnel management, industrial relations
- T. Ige, Ph.D.—business economics
- L.W. Jacobs, Ph.D.—management, marketing, industrial relations
- L.E. Jacobsen, Ph.D.—accounting, finance
- R. Kessner, Ed.D.—management
- S. Kim, Ph.D.—business economics
- H.E. Kramer, Ph.D.—marketing
- E.E. Laitila, Ph.D.—real estate
- S.S.O. Lee, Ph.D.—accounting
- K.H. Lie, Ph.D.—business economics and quantitative methods
- H.D. Lowe, D.B.A.—accounting
- J.V. Miccio, Ed.D.—management
- J.R. Omph, Ph.D.—accounting
- E.C. Pendleton, Ph.D.—labor economics, industrial relations
- H.C. Reeser, Ph.D.—management



- E. Richman, D. Eng. Sci.—management
- K.K. Seo, Ph.D.—business economics, money and banking
- C.H. Spencer, D.B.A.—accounting
- R.H. Sprague, Ph.D.—systems analysis
- H.B. Stellmacher, M.B.A.—marketing
- R.A. Taussig, Ph.D.—accounting
- A.M. Whitehill, Ph.D.—international management

The objective of the College of Business Administration is to provide service to the state of Hawaii and the Pacific area by meeting their needs for an institution of top quality, offering opportunities for the development of administrative skills (or those skills required for the successful management of business organization). The M.B.A. program is designed to fulfill this objective by offering to qualified people of various educational and cultural backgrounds the opportunity of studying business administration in a multi-cultural environment. The curriculum is set up so that students receive a broad base of graduate level knowledge on which to develop their decision-making skills. The methods of teaching vary from lecture and seminar courses to those in which the case study method is predominant, and the material covered relates to both large and small business management and freely incorporate studies of an international nature. The M.B.A. program is presently being offered on the Manoa campus in Honolulu and overseas in Japan and Okinawa.

Intended candidates for the M.B.A. must submit the results of the Educational Testing Service Examination "Admission Test for Graduate Study in Business."

For graduate students not having backgrounds in business administration, a group of 500-level courses is offered for the purpose of achieving an orientation to the graduate level courses.

All of the 500 courses will be required unless specifically exempted on the basis of academic records or proficiency demonstrated to the department chairman involved.

Students are admitted on the basis of undergraduate grade averages and the results of the ATGSB examination.

There are two programs leading to the M.B.A., both requiring a minimum of 33 hours of work. One is a thesis program offered under Plan A of the Graduate Division, the other is a nonthesis program offered under Plan B of the Graduate Division. The College of Business Administration does not require the General Examination (as defined in this *Bulletin*) for either M.B.A. program, nor does it require the final examination for the M.B.A. Plan B. The college does require a final oral examination for the M.B.A. Plan A.

**Program Requirements—MBA Plan A**

- Group I, Foundation Courses—required only of students not possessing an undergraduate background in business administration. Do not count towards the 33 required credit hours ..... up to 15 hours
- Group II, Advanced Disciplines & Functions ..... 18 hours
- Group III, Electives ..... 9 hours
- Group IV, Thesis ..... 6 hours

---

33 hours

**Program Requirements—MBA Plan B**

- Group I, Foundation Courses—required only of students not possessing an undergraduate background in business administration. Do not count towards the 33 required credit hours .... up to 15 hours
- Group II, Advanced Discipline & Functions ..... 21 hours
- Group III, Electives ..... 9 hours
- Group IV, Integrative ..... 3 hours

---

33 hours

**BUSINESS ADMINISTRATION**

Group I

- (Bus)
- 501 Accounting (3)
- 502 Economic Analysis (3)
- 503 Introduction to Quantitative Methods (3)
- 504 The Management Process (3)
- 505 Marketing and Operations Management (3)

Group II

- 601 Managerial Accounting (3)
- 611 Statistical Methods of Business Analysis (3)
- 621 Managerial Economics (3)
- 631 Finance (3)
- 641 Management: A Systems Analysis (3)
- 642 Behavioral Science for Business (3)
- 651 Marketing (3)

Group III

- Accounting (Acc)
- 437 Advanced Tax Problems (3)
- 445 Advanced Cost Accounting (3)
- 703 Advanced Auditing (3)
- 704 Computers and Accounting In Business Systems (3)
- 705 Advanced Accounting Problems (3)
- 706 Accounting History and Theory (3)
- 707 Accounting for Management Planning and Control (3)
- 708 Seminar in Advanced Accounting (3)
  
- Business Analysis & Quantitative Methods (BAS)
- 455 Applied Regression Analysis (3)
- 713 Statistical Decision Theory (3)
- 714 Operations Research (3)
- 715 Quantitative Methods of Business and Economic Forecasting (3)
  
- Business Economics (BEc)
- \*721 Multinational Business in World Economics
- 723 Operations Economics (3)
- 724 Current Economic Problems (3)
- \*725 Capital Markets and International Finance (3)
  
- Finance (Fin)
- 733 Problems in Business Finance (3)
- 734 Investment Analysis and Management (3)
- 735 The Financial System (3)
  
- Law (Law)
- 786 Environment of Business (3)
  
- Management (Mgt)
- 743 Selected Topics in Organization Theory and Practice (3)
- \*744 Comparative Management (3)
- 746 Production and Operations Management (3)
  
- Marketing (Mkt)
- 752 Consumer Behavior
- \*753 International Marketing Management (3)
- 754 Marketing Communication and Promotional Strategy (3)
- 755 Marketing Research Methodology (3)
  
- Personnel and Industrial Relations (PIR)
- 763 Personnel Administration (3)
- 764 Advanced Personnel Administration (3)
- 765 Labor Relations (3)
- 766 Problems of Collective Bargaining (3)
  
- Real Estate (RE)
- 441 Land Economics
- 773 Real Estate (3)
- 774 Land Resource Development (3)
  
- Management Information System (BAS)
- 783 Data Management Systems (3)
- 784 Management Information Systems (3)
- 785 Systems Analysis-A Computer Approach to Decision Models (3)
- 786 Computer Simulation-Business & Economics (3)
  
- Transportation (Trans)
- 453 Air Travel Management
  
- Travel Industry Management (TIM)
- 775 Advanced Travel Industry Management (3)
  
- Research (Bus)
- 799 Directed Research

Group IV

- (Bus)
- 796 Business Policy
- 799 Directed Research
- 800 Thesis (6)

---

\*Courses 721, 725, 744, and 753 comprise International Business Course group.

## Chemistry

### Graduate Faculty

- R. L. Pecsok (Chairman)—chromatography, preparation and analysis of ultrapure materials
- G. Andermann, Ph.D.—analytical chemistry, emission spectroscopy, X-ray spectroscopy, infrared reflectance studies
- T. T. Bopp, Ph.D.—physical chemistry, nuclear magnetic resonance
- R. W. Buddemeier, Ph.D.—inorganic and environmental chemistry, radiocarbon dating, distribution of natural carbon isotopes, geochronology
- R. E. Cramer, Ph.D.—inorganic chemistry, nuclear magnetic resonance contact shifts, EPR of sigma radicals, molecular orbital calculations
- J. W. Gilje, Ph.D.—inorganic chemistry, boron hydride chemistry, phosphorus and nitrogen chemistry
- A. T. Hubbard, Ph.D.—electroanalytical chemistry, thin layer electrodes, platinum complexes, fused salts
- J. L. Ihrig, Ph.D.—reaction mechanisms, free radicals, kinetics magnetochemistry
- R. G. Inskeep, Ph.D.—infrared spectroscopy, hydrogen bonding, complex ions
- E. F. Kiefer, Ph.D.—organic chemistry, small ring compounds, olefin transition metal complexes, nuclear magnetic resonance
- H. O. Larson, Ph.D.—natural products, new synthetic methods, rearrangements
- R. S. H. Liu, Ph.D.—organic photochemistry
- J. A. Mann, Ph.D.—physical chemistry, theoretical chemistry, physics and chemistry of surfaces
- R. L. McDonald, Ph.D.—physical chemistry, solvent extraction of inorganic complexes, kinetics of isotopic exchange reactions
- R. E. Moore, Ph.D.—organic chemistry, structure determination and biosynthesis of natural products from marine organisms
- D. W. Muenow, Ph.D.—high temperature mass spectrometry, volatile components of materials of geochemical interest
- J. J. Naughton, Ph.D.—analytical, physical, solid state and geochemistry
- L. L. Schaleger, Ph.D.—physical organic chemistry, kinetics and mechanism, hydrolysis and hydration phenomena
- P. J. Scheuer, Ph.D.—organic chemistry, structure determination of natural products
- K. Seff, Ph.D.—physical chemistry, structure determination by X-ray crystallography
- J. L. T. Waugh, Ph.D.—boron chemistry, intermetallic and heteropoly compounds, X-ray studies
- H. Zeitlin, Ph.D.—oceanographic chemistry, reflectance spectrophotometry

Graduate study in chemistry has three aspects: course work, independent study, and research. A thesis based

on original research is the most important part of the master's or doctor's degree. Comprehensive examinations taken by Ph.D. candidates encourage a student to read the original literature in his field of interest.

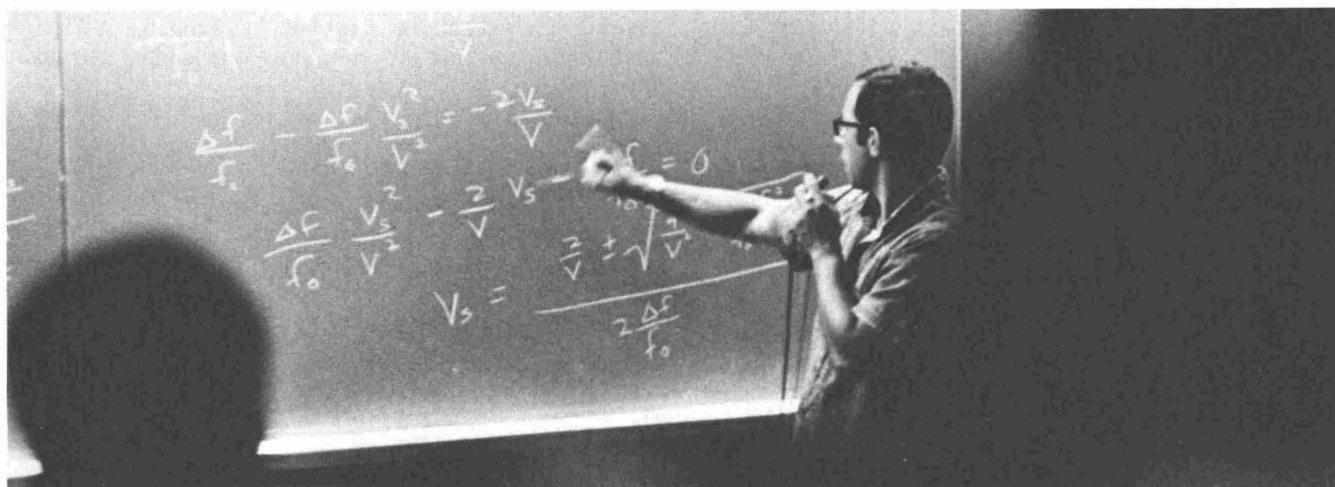
Intended candidates for the M.S. or Ph.D. must present the following minimum undergraduate preparation in chemistry: year courses in general, organic, analytical, and physical chemistry.

The candidate for a M.S. in chemistry is granted 12 course credits for an acceptable thesis. The remaining 18 credits must be selected from those listed below or from graduate offerings in mathematics and the natural sciences. Required courses are marked with an asterisk.

The department of chemistry at the University of Hawaii offers M.S. and Ph.D. research and study opportunities in analytical, inorganic, organic and physical chemistry with specialized research opportunities offered in environmental and marine related chemistry. Additional details may be found in a departmental brochure.

### CHEMISTRY (Chem)

- |          |   |
|----------|---|
| 445      | Modern Synthetic Methods (3)                                  |
| 621      | Introductory Quantum Chemistry (3)                            |
| 622      | Advanced Inorganic Chemistry I (3)                            |
| 623      | Advanced Inorganic Chemistry II (3)                           |
| 631      | Instrumental Methods of Analysis (3)                          |
| 632      | Electroanalytical Chemistry (3)                               |
| 633      | Introduction to Spectroscopy (3)                              |
| 641      | Advanced Organic Chemistry: Structure and Stereochemistry (3) |
| 642      | Advanced Organic Chemistry: Mechanisms (3)                    |
| 651-652  | Intermediate Physical Chemistry (3-3)                         |
| 655      | Radiochemistry and Nuclear Reactions (3)                      |
| 656      | Radiochemical Techniques (1)                                  |
| *691-692 | Seminar (1-1)   |
| 721-722  | Special Topics in Inorganic Chemistry (v.)                    |
| 731-732  | Special Topics in Analytical Chemistry (v.)                   |
| 741-742  | Special Topics in Organic Chemistry (v.)                      |
| 744      | Organic Applications of Spectroscopy (3)                      |
| 751-752  | Special Topics in Physical Chemistry (v.)                     |
| 753      | Quantum Chemistry (3)   |
| 756      | Statistical Mechanics (3)                                     |
| 758      | Crystallography (3)   |
| 761-762  | Special Topics in Environmental Chemistry (v.)                |
| 799      | Directed Research (v.)  |
| *800     | Thesis Research (v.)  |





**Civil Engineering***Graduate Faculty*

M. L. P. Go, Ph.D. (Chairman)—structures  
 R. D. Bauman, Ph.D.—transportation engineering  
 C. L. Bretschneider, Ph.D.—ocean engineering  
 N. C. Burbank, Sc.D.—environmental and sanitary engineering  
 A. N. L. Chiu, Ph.D.—structures  
 J. R. Evans, M.S.—soil mechanics  
 Y. S. Fok, Ph.D.—hydrology, water resources system analysis  
 R. A. Grace, Ph.D.—hydrology, hydraulics  
 H. S. Hamada, Ph.D.—structures, applied mechanics  
 H. P. Harrenstien, Ph.D.—applied mechanics  
 H. W. Klemmer, Ph.D.—sanitary microbiology (PBRC)  
 L. S. Lau, Ph.D.—hydrology, environmental and sanitary engineering  
 T. Mitsuda, Ph.D.—applied mechanics  
 N. N. Nielsen, Ph.D.—structures  
 R. S. Szilard, Ph.D.—structures, applied mechanics  
 G. T. Taoka, Ph.D.—applied mechanics  
 J. A. Williams, Ph.D.—hydromechanics  
 R. H. F. Young, Sc.D.—environmental and sanitary engineering  
 S. S. Zundelevich, Ph.D.—structures, applied mechanics

*Affiliate Faculty*

A. Q. Y. Tom, Sc.D.—environmental and sanitary engineering

Applicants for admission to the M.S. program in civil engineering must present a B.S. in civil engineering or the equivalent. A general examination will be required. For either Plan A (thesis) or Plan B (nonthesis), a minimum of 30 credits including two graduate seminars, approved by the student's committee, is required. Plan A will include from 6 to 9 credits of thesis research. For either plan, a minimum of 12 credits is required in graduate civil engineering courses (numbered 600 and above) exclusive of thesis, seminar and directed reading or research. Additional information regarding course details and degree requirements may be obtained from the department office.

## CIVIL ENGINEERING (CE)

624 Flow in Porous Media (3)  
 626 Surface Water Hydrology (3)  
 627 Ground Water Hydrology (3)  
 628 Water Resources Planning and Development (3)  
 629 Water Resources System Analysis (3)  
 631 Environmental and Sanitary Engineering Theory I (3)  
 632 Environmental and Sanitary Engineering Theory II (3)  
 633 Environmental and Sanitary Engineering Design I (3)  
 634 Environmental and Sanitary Engineering Design II (3)  
 635 Environmental and Sanitary Engineering Chemistry (4)  
 636 Environmental and Sanitary Engineering Microbiology (4)  
 637 Environmental and Sanitary Engineering Lab (3)  
 638 Environmental and Sanitary Engineering Public Health (3)  
 641 Marine Disposal of Wastes (3)  
 651 Soil Mechanics (3)  
 664 Analysis and Design of Urban Transportation Systems (3)  
 665 Simulation and Modeling of Urban Systems (3)  
 671 Theory of Elasticity I (3)  
 675 Theory of Vibrations (3)  
 676 Structural Dynamics (3)  
 677 Energy Methods in Applied Mechanics (3)  
 678 Theory of Plates (3)  
 679 Theory of Thin Shells (3)  
 681 Advanced Indeterminate Structures (3)  
 682 Numerical Methods of Structural Analysis (3)  
 683 Advanced Reinforced Concrete Design I (3)

684 Advanced Reinforced Concrete Design II (3)  
 685 Plastic Analysis of Metal Structures (3)  
 696 Selected Topics in Civil Engineering (3)  
 697 Seminar in Civil Engineering I (1)  
 698 Seminar in Civil Engineering II (1)  
 699 Directed Reading or Research (v.)  
 800 Thesis Research (v.)

**Classics***Graduate Faculty*

A. Burns, Ph.D. (Chairman)—Roman republic, Greek philosophy  
 R. Littman, Ph.D.—Greek history  
 J. Tyler, Ph.D.—Roman and Greek poetry, drama

Two plans are offered. Plan A (thesis) is intended primarily for students planning to continue to a doctorate in classics. Plan B (nonthesis), leading to the M.A. in classics—Latin, is intended primarily for students who wish to emphasize course work in Latin with a view to teaching in secondary schools.

Requirements for admission are those of the Graduate Division and a B.A. degree in Greek, Latin or Classics with a minimum grade-point average of 3.0 in the major field. Students with a slightly lower grade-point average may be admitted on a provisional basis.

Under Plan A, degree requirements include 30 semester hours of work in Latin or Greek. The distribution of work between Latin and Greek will depend on the student's main interest and the results of the preliminary conference and examination. Of the 30 hours, 6 will be allowed for thesis, and 12 must be in courses numbered 600-799. Candidates must demonstrate a reading knowledge of German or French. Oral defense of the thesis will complete the program.

Under Plan B, 30 semester hours are required, of these at least 18 must be in courses numbered 600-799. Concentration of course work will be in Latin. The student will be expected to demonstrate a knowledge of Greek civilization which may be acquired through graduate or undergraduate course work in Greek, ancient history, Greek philosophy, literature in translation, or through independent study. Candidates must show a reading knowledge of German or French. A comprehensive examination completes the degree requirements.

## LATIN (Latin)

409 Lyric Poets (3)  
 420 Vergil (3)  
 427 Satire (3)  
 428 Drama (3)  
 433 Roman Philosophy (3)  
 434 Lucretius (3)  
 440 Oratory (3)  
 490 Seminar (3)  
 601 Advanced Latin Composition (3)  
 610 Literature of the Republic (3)  
 611 Augustan Literature (3)  
 612 Literature of the Empire (3)  
 651 Seminar in Roman Literature (3)  
 699 Directed Research (v.)

- GREEK (Greek)  
 409 Plato (3)  
 410 Historians (3)  
 421 Homer (3)  
 422 Lyric Poetry (3)  
 431 Introduction to Drama (3)  
 432 Drama (3)  
 441 Pre-Socratics (3)  
 442 Aristotle (3)  
 490 Seminar (3)  
 651 Seminar in Greek Literature (3)  
 699 Directed Research (v.)

- CLASSICS  
 800 Thesis Research (6)

- EUROPEAN LANGUAGES (EL)  
 630 Seminar in Research Methods (1)

## Drama and Theatre

### Graduate Faculty

- E. Ernst, Ph.D. (Chairman)—Oriental theatre, aesthetics  
 J. Brandon, Ph.D.—Oriental theatre  
 G. Cannon, A.B.—acting, directing  
 D. Carroll, Ph.D.—playwriting, theory  
 T. Knapp—acting, directing  
 E. Langhans, Ph.D.—theatre history  
 R. Mason, M.F.A.—design  
 J. Trapido, Ph.D.—stagecraft and lighting, theatre planning  
 C. Wolz, M.A.—dance

### M.A. and M.F.A.

Two master's degrees are offered: the master of arts (both Plan A and Plan B) and the master of fine arts. For the M.A. thesis the candidate does research in theatre history, criticism, or theory. The M.F.A. thesis consists of an essay and a record of creative work in play production, playwriting, design, or dance.

Intended candidates must present an adequate undergraduate background in the humanities, submit three letters of recommendation, submit official scores for the Graduate Record Examination aptitude tests, pass a foreign language examination and a general examination in drama and theatre before admission to candidacy. East-West Center grantees from the United States must attain proficiency in an Asian language.

All candidates must take 461-462, 610, 660, and 6 credits from 620, 631 or 632, 640, or 650. Those with sufficient undergraduate preparation may take approved related graduate courses in other departments. Besides work in course, candidates must participate in the production of at least three plays.

Final oral and written comprehensive examinations are required of all candidates.

### Ph.D.

The doctor of philosophy degree, given for scholarship in theatre history, criticism, or theory, not creative or artistic work, is offered in three areas: (1) **Western Theatre**. Required courses are 610 and two other

seminars. A minor of at least 12 graduate credit hours is required in anthropology, art, English, history, music, or philosophy. (2) **Oriental Theatre**. Required courses are 610, 664, and one other seminar. A minor of at least 12 graduate credit hours is required in Far Eastern history, art history, or philosophy; or in Oriental drama and literature. (3) **Comparative Oriental-Western Theatre**. The curriculum is determined by the graduate faculty.

The degree is not conferred for the acquisition of academic credits. It is granted only to candidates who demonstrate outstanding ability to do imaginative research and who present the results in a cogent dissertation.

Applicants for admission to the Ph.D. program must submit a detailed statement of the research they propose, three letters from those acquainted with their academic work, a sample of their research (such as a seminar paper or master's thesis), and official scores from the Graduate Record Examination aptitude tests.

Admission to candidacy requires a broad background in the humanities, a master's degree in theatre or its equivalent, and competence in dramatic production. Two foreign languages appropriate to the proposed area of research are required; for candidates in Oriental theatre and comparative Oriental-Western theatre at least one language must be Asian.

Candidates must demonstrate their teaching ability by giving several lectures in an undergraduate course.

- DRAMA AND THEATRE (Drama)  
 340 Advanced Stagecraft (3)  
 353-354 Design in the Theatre (3-3)  
 356 Costume for the Stage (3)  
 370 Creative Dramatics (3)  
 372 Drama in Performance (3)  
 381-382 Intermediate Modern Dance (3-3)  
 383-384 Intermediate Ballet (3-3)  
 388 Dance Composition (3)  
 410 Theatre Management (3)  
 421-422 Advanced Acting (3-3)  
 440 Advanced Stage Lighting (3)  
 461-462 History of the Theatre (3-3)  
 464 Oriental Drama and Theatre: India and Southeast Asia (3)  
 465 Oriental Drama and Theatre: China and Japan (3)  
 468 Dance History (3)  
 474 Children's Theatre (3)  
 476 Puppetry (3)  
 481-482 Advanced Modern Dance (3-3)  
 483-484 Advanced Ballet (3-3)  
 490 Playwriting (3)  
 492 Advanced Playwriting (3)  
 610 Seminar in Theatre Research (3)  
 620 Advanced Acting Techniques (3)  
 631-632 Seminar in Direction (3-3)  
 640 Problems in Stagecraft and Stage Lighting (3)  
 650 Advanced Design (3)  
 660 Theories of the Theatre (3)  
 662 Seminar in Drama and Theatre (3)  
 664 Seminar in Oriental Theatre (3)  
     (1) India and Southeast Asia  
     (2) China and Japan  
 699 Advanced Theatre Practice (3)  
 730 Seminar in Direction (3)  
 750 Seminar in Design (3)  
 760 Seminar in Aesthetics of the Theatre (3)  
 799 Directed Work (3)  
 800 Thesis Research (v.)

## Economics

### Graduate Faculty

- B. Campbell, Ph.D. (Chairman)—macroeconomic theory, monetary theory  
 S. Comitini, Ph.D.—marine resource economics, international economics  
 P. Demeny, Ph.D.—economic demography, microeconomics  
 M. Friedman, Ph.D.—economic theory\*  
 W. Gorter, Ph.D.—international economics  
 R. Heller, Ph.D.—international economics, monetary theory  
 F. Hung, Ph.D.—microeconomics, economic development  
 R. Kamins, Ph.D.—public finance  
 Y. Lim, Ph.D.—economic development, monetary theory  
 W. Miklius, Ph.D.—industrial organization, regional economics  
 L. Miller, Ph.D.—monetary theory, microeconomics  
 S. Naya, Ph.D.—international economics, economic development  
 H. Oshima, Ph.D.—economic development, income accounting  
 R. Pollock, Ph.D.—public finance, macroeconomics  
 J. Power, Ph.D.—economic development, economic theory  
 A. Takayama, Ph.D.—mathematical economics, international trade\*  
 K. Yamamura, Ph.D.—comparative economic development\*  
 Y. Yeh, Ph.D.—international economics

\*Visitor, 1971-72. +Visitor, Spring 1972.

The department offers programs leading to the M.A. and Ph.D. in economics. These programs are designed to prepare students for careers as research economists in government and business and for careers in the academic profession.

All students are expected to acquire a strong background in economic theory. In addition, specialization is possible in the following fields: economic development, international economics, urban and regional economics, public finance, monetary economics, economic history, econometrics, mathematical economics, economic demography, human resource economics, and marine resource economics.

Faculty research interests and the supporting programs of the University make a regional emphasis focusing on Asia and the Pacific possible in many of the fields listed.

### Departmental Requirements

Entering graduate students are expected to have completed courses in intermediate micro and macroeconomic theory, in money and banking, and in elementary statistics. Students not having these courses will be expected to complete them before being admitted to candidacy. Although not required for all fields, mathematics through calculus is necessary for some fields of specialization and will prove useful for anyone planning to work for a Ph.D. in economics.

All degree candidates must pass Economics 600 and 601 with a B or better in each course and must take and pass Economics 425. These requirements may be waived if a candidate can demonstrate that he has met their equivalent elsewhere or under the Plan C program of the M.A. degree.

Official scores of the Aptitude and Advanced Economics sections of the Graduate Record Examinations and two letters of recommendation must be submitted by applicants for graduate status in economics.

## M.A.

The department offers Plan A, Plan B, and Plan C programs leading to the M.A. degree.

Plan A candidates may count 6 units taken outside the department and 9 units of thesis research toward the 30 credit hours they are required to complete.

Plan B candidates must pass a written comprehensive examination covering micro and macroeconomic theory and either (a) pass a written examination in one additional field or (b) submit acceptable term papers in graduate courses in two additional fields. Plan B candidates may count 9 units taken outside the department toward the 30 units required for the M.A. degree.

A limited number of M.A. candidates can be admitted to Plan C by a general (oral or written) exploratory examination in the beginning of each semester. Plan C candidates must pass the comprehensive examination of Plan B (a) and a final oral examination and submit a research paper. No specific course credits are required under this plan.

## Ph.D.

Ph.D. students must pass a qualifying examination, a comprehensive examination, and a final oral examination in defense of their dissertation.

They must also demonstrate, either through course work at the U.H. or elsewhere or by passing an examination, competence in econometrics at the Econ 426 level and in history of economic thought at the Econ 404 level.

The qualifying examination, which is the same as the M.A. comprehensive examination in micro and macroeconomic theory, will normally be taken soon after the student has completed the courses required of all degree candidates.

In addition to the oral examination required by the Graduate Division, the comprehensive examination will include written examinations covering micro and macroeconomic theory and either (a) two additional fields in economics or (b) one additional field in economics and one outside field (approved by the department).

### ECONOMICS (Econ)

- 400 Growth and Fluctuations (3)
- 404 History of Economic Thought (3)
- 405 Comparative Economic Systems (3)
- 410 Economic Development (3)
- 411 Economic Development of Europe (3)
- 412 Economic Development of U.S. (3)
- 415 Asian Economic Development (3)
- 420 Mathematical Economics (3)
- 425 Econometrics I (3)
- 426 Econometrics II (3)
- 430 Economics of Human Resources (3)
- 440 Monetary Theory and Policy (3)
- 450 Public Finance (3)
- 452 State and Local Finance (3)
- 458 Public Resource Allocation (3)
- 460 International Trade Theory (3)
- 461 International Finance
- 470 Industrial Organization and Public Control of Business (3)
- 480 Transportation and Public Utilities (3)
- 490 Location Theory and Regional Analysis (3)

- 492 Regional Economic Development (3)
- 495 Urban Economics (3)
- 496 Selected Topics in Contemporary Economic Problems (3)
- 600 Macroeconomic Theory (3)
- 601 Microeconomic Theory (3)
- 602 Economic Growth and Fluctuation (3)
- 603 Advanced Microeconomic Theory (3)
- 604 History of Economic Thought (3)
- 605 Mathematical Economics (3)
- 606 National Income Accounts (3)
- 610 Economic Development I (3)
- 611 Economic Development II (3)
- 613 Economic Development of the West (3)
- 614 Economic Development of Japan (3)
- 616 Economic Development of China and Korea (3)
- 618 Economic Development of Southeast Asia (3)
- 624 Advanced Econometrics I (3)
- 626 Advanced Econometrics II (3)
- 627 Economic Programming (3)
- 640 Monetary Theory (3)
- 650 Theory of Public Finance (3)
- 651 Theory of Public Finance-Revenue (3)
- 660 International Trade Theory (3)
- 662 International Finance (3)
- 670 Human Resources and Manpower Economics (3)
- 672 The Economics of Population Growth (3)
- 690 Regional Economic Analysis (3)
- 698 Seminar in Marine Economics (3)
- 699 Directed Research (v.)
- 700 Seminar: Macroeconomic Theory (3)
- 701 Seminar: Microeconomic Theory (3)
- 710 Seminar in Economic Development (3)
- 730 Research Seminar (3)
- 745 Workshop: Financial and Monetary Aspect of Economic Development (v.)
- 760 Seminar in International Economics (3)
- 780 Selected Topics in Economic Analysis (3)
- 800 Thesis Research (v.)

## Educational Administration

### Graduate Faculty

- R.R. Dunwell, Ed.D. (Chairman)—administrative theory; research in educational administration
- H.V. Everly, Ph.D.—general school administration
- C.R. Ingils, Ed.D.—educational administrative theory and practice; supervision; personnel; public relations
- J.A. Thompson, Ph.D.—school law; finance; collective negotiations
- S.S. Varney, Ed.D.—systems analysis; educational management; public relations

Intended candidates for the M.Ed. must present a minimum of 10 semester hours in professional education courses, and in addition, have had two years of successful teaching experience. Applicants shall provide written evidence of such experience when applying.

Admission to candidacy is based upon (1) the quality of the student's undergraduate and graduate record; (2) the Advanced Test in Education of the Graduate Record Examination and the Miller Analogies Test (a minimum score at the 50th percentile is considered satisfactory on each test); (3) successful completion of EA 685; and (4) an oral interview by the department of educational administration.+

Plan A requires 30 semester hours, 6 of which are earned through the thesis. In addition to EA 685, course credit hours must include 3 in educational foundations, 3 in educational psychology, 3 in research methods, and at least 2 seminars in educational administration or supervision.

Plan B, the nonthesis plan, requires 36 semester hours. Required are EA 685, 3 semester hours in educational psychology, 3 semester hours in educational foundations, 1 seminar in educational administration or supervision, and EA 700, Research Seminar in Educational Administration. Nine to 15 of the 36 required hours must be in fields other than educational administration and supervision.

A minimum of 15 semester hours in educational administration is required for completion of the M.Ed under either Plan A or B.

Selection of specific courses in the above fields will be by the program committee of the candidates.

The department of educational administration will accept a maximum of 9 semester hours toward the master's in educational administration when such work is taken as a regular graduate student.

## EDUCATIONAL ADMINISTRATION (Ed EA)

- 600 Theory of Administration (3)
- 610 School-Community Relations (3)
- 620 School Finance (3)
- 623 Administrative Problems in Physical Education (3) (Identical with HPE 623)
- 630 School Law (3)
- 640 Systems Analysis in Educational Administration (3)
- 650 School Personnel Practices (3)
- 660 School Plant (3)
- 670 School Supervision (3)
- 680 School Organization (3)
- \*685 Educational Administration: Theory and Principles (3)
- 699 Directed Research (v.)
- ‡700 Research Seminar in Educational Administration (3)
- 720 Seminar and Internship in Administrative Leadership (v.)
- 770 Seminar in School Supervision (3)
- 780 Seminar in Educational Administration (3)
  - (1) Elementary
  - (2) Intermediate
  - (3) Secondary
  - (4) Adult
  - (5) Technical and Vocational
  - (6) Community College
  - (7) Higher Education
- §800 Thesis Research (v.)

\*Master's candidates, Plan A and B.

+EA 685 shall be taken as early as possible in the program for those students working toward the M.Ed. in educational administration. The required oral interview shall be conducted in the second quarter of the course.

‡EA 700 shall be taken during the last semester of work for M.Ed. of educational administration candidates—Plan B.

§Required of Plan A candidates.

## Educational Communications

### Graduate Faculty

G.Z. Kucera, Ph.D. (Chairman)—communications and sociology  
 L.A. Butler, Jr., Ph.D.—educational communications and curriculum development  
 L.A. Lum, M.Ed.—curriculum and educational technology  
 R.A. Sanderson, Ph.D.—educational communications  
 R.J. Sparks, Ph.D.—communications and educational technology  
 W.A. Wittich, Ph.D.—educational communications and public administration

### Affiliate Faculty

E.O. Minor, Ed.D.—educational technology

Educational communications is a field of study concentrating on the application of new technological advancements to the general areas of education. After determination of learner needs and curricular objectives, the task of educational communications is to identify and plan the most expedient and the most efficient teaching strategies and learning experiences through various media channels. Drawing many of its major premises from the disciplines of psychology and other behavioral sciences, and operating within the general framework of the theories of curriculum development, educational communications emphasizes thoughtful application of media for the improvement of teaching and learning, and seeks the formulation of proper administrative procedures necessary for a systematic and meaningful integration of mediated experiences into the teaching-learning process.

The department of educational communications has set the following objectives for its graduate students who, at the conclusion of their study and training should:

- (1) be conversant with and communicative in learning aspects of educational media and methods;
- (2) have knowledge of the existing body of media research, its meaning and influence on practical applications of new media techniques in the teaching-learning process;
- (3) be well acquainted with the principles and processes of systems analysis as applied to teaching-learning situations;
- (4) be able to plan, design and execute meaningful applications of instruction with systematic use of media;
- (5) be proficient in techniques involved in origination of instructional materials for use in classroom and other learning situations;
- (6) be capable of engaging in planning and creating new media learning facilities, in modifying existing ones, and in administering them as curriculum support programs for the benefit of learners as well as teachers.
- (7) have developed a positive professional attitude, through an active involvement in appropriate professional organizations and community services.

Applicants for admission must possess a bachelor's degree from an accredited institution and have had at

least one year of successful teaching experience, or equivalent.

Admission to candidacy is based on: (1) the quality of the student's undergraduate record; (2) his performance on a departmental general examination; (3) his teaching or comparable experience; (4) at least a 3.0 (B) average in his graduate work; (5) the Graduate Record Examination; aptitude test (verbal and quantitative), and advanced test in education (code 34).

Thesis and nonthesis programs are based on 30 credits beyond the bachelor's degree. At least 18 hours must be in the field of educational communications as such. Thesis Plan A requires 24 credits plus 6 thesis credits. Nonthesis Plan B requires 30 credits and in addition, the completion of a seminar report.

The courses with an asterisk are required for the M.Ed. degree in educational communications.

### EDUCATIONAL COMMUNICATIONS(Ed EC)

- 314 Audio Visual Techniques (2)
- \*404 Survey of Educational Communications Media (3)
- 599 Workshop in Educational Media (1)
- 614 Audio Visual Media Systems (3)
- \*620 Production of Instructional Materials (3)
- 623 Survey and Production of Asian and Pacific Study Materials (3)
- 625 Educational Still Photography (3)
- 626 Educational Motion Pictures (3)
- \*630 Television in Education (3)
- 635 Advanced Educational Television (3)
- 639 Mass Media and Education (3)
- 640 Programmed Learning (3)
- 650 Mass Services Administration (3)
- 699 Directed Research (v.)
- \*700 Seminar in Educational Media Research (3)
- 710 Seminar in Organization and Administration of Media Programs (3)
- 800 Thesis Research (v.)

## Educational Foundations

### Graduate Faculty

R. Stueber, Ph.D. (Chairman)—history  
 S. Amioka, Ph.D.—philosophy, Japanese education (on leave)  
 R. Anderson, Ph.D.—comparative education  
 W. Boyer, Ed.D.—philosophy, social foundations  
 M. Ezer, Ed.D.—social foundations  
 G. Frazier, Ph.D.—philosophy, social foundations  
 S. Jaeckel, Ed.D.—history, social foundations  
 A. Keppel, Ph.D.—history  
 V. Kobayashi, Ph.D.—comparative education, philosophy  
 R. Potter, Ed.D.—history, social foundations

The purpose of the master's degree program in educational foundations is to develop educators capable of critical analysis of alternatives in educational policy and practice related to the social and moral problems faced by the state, nation, and the world. The candidate studies educational theory using the fields of history, philosophy, and the social sciences as well as other areas in professional education. Sharp distinctions between theory and practice, and the humanistic and scientific components of education are avoided.

Intended candidates for the M.Ed. degree normally present credit hours in undergraduate professional education equivalent to the requirements for the B.Ed. at the University of Hawaii. B.A. holders without supervised student teaching may be accepted provided they make a commitment to education, have equivalent experience (such as Peace Corps or Vista), or provided they make up such experience before admission to candidacy.

Advancement to candidacy is based on the quality of the student's work during the first semester in the program.

Both Plan A (thesis) and Plan B (nonthesis) are available. In both programs, requirements include at least 30 semester credits, two of the Ed EF courses marked with an asterisk, and at least one seminar in the department. Courses in fields of study other than educational foundations will normally be concentrated in one or two of the following: American studies, anthropology, Asian studies, economics, history, philosophy, political science, religion, sociology, or other graduate fields in education. When offered, graduate courses in educational foundations not listed below may be included in degree programs.

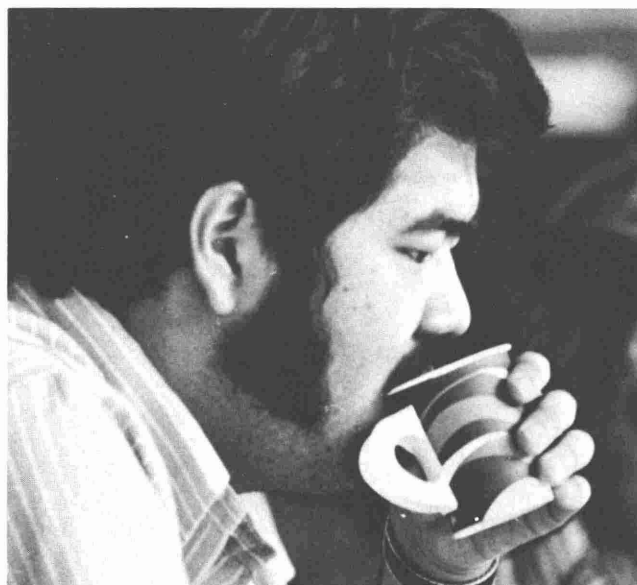
**Plan A:** The program may include a maximum of 10 semester credits in approved courses other than educational foundations if related to the candidate's announced goals. The thesis carries 6 credit hours. No more than 2 credits of directed research (Ed EF 699) may be included in Plan A. An oral examination on the thesis constitutes the final examination.

**Plan B:** The program normally includes 18 semester hours of education of which at least 12 credits are in the department of educational foundations. Twelve credits in a planned and approved sequence of courses in other fields are also normal requirements. No more than 6 credits of 699 may be included in Plan B. A final seminar appearance is required at which time the student presents his Plan B project.† This presentation constitutes the final examination in Plan B.

#### EDUCATIONAL FOUNDATIONS (Ed EF)

- 409 Culturally and Economically Disadvantaged Pupil (3)
- \*445 Educational Sociology (3)
- 480 Anthropology and Education (3)
- 485 Education for a World Without War (3)
- \*650 Historical Foundations of Western Education (3)
- \*651 History of American Education (3)
- 652 History of Education in Hawaii (3)
- 657 Community College (3)
- \*660 Philosophy of Education (3)
- 665 Comparative Ideologies and Education (3)
- \*669 Foundations of Comparative Education (3)
- \*670 Comparative Education: Europe and America (3)
- \*671 Comparative Education: Asia (3)
- 681 The Church and the School (2)
- \*683 Social Foundations of Education (3)
- 685 Education in America (3) (for foreign students only)
- 699 Directed Reading and/or Research (v.)
- 751 Recent History of American Education (3)
- 757 Educational Utopias (2)

†See department brochure on Plan B.



- 761 History of American Higher Education (3)
- 763 Seminar in Educational Theory (2)
  - (1) Educational Issues
  - (2) John Dewey
  - (3) Contemporary Educational Philosophers
  - (4) Japanese Educational Philosophy
  - (5) History of Education
- 768 Seminar in Problems in Education (v.)
- 770 Seminar in Comparative Education (2)
- 800 Thesis Research (v.)

## Educational Psychology

### Graduate Faculty

- I.E. Reid, Ph.D. (Chairman)—learning, measurement
- D.C. Adkins, Ph.D.—statistics and measurement
- T.M.C. Chang, Ph.D.—education of culturally disadvantaged, school psychology
- D.R. Collins, Ed.D.—school counseling
- P. Dunn-Rankin, Ed.D.—statistics, computer application
- H.J. Dupont, Ph.D.—education of emotionally disturbed
- G.Y. Fujita, Ph.D.—statistics
- D.W. Fullmer, Ph.D.—counseling; group and individual
- T. Gust, Ph.D.—counseling
- F.P. Haehnlen, Ph.D.—college student personnel
- D.K. McIntosh, Ed.D.—education of mentally retarded
- D.A. Leton, Ph.D.—school psychology
- W. Nunokawa, Ph.D.—counseling
- T.A. Ryan, Ph.D.—learning, measurement
- D.G. Ryans, Ph.D.—measurement
- A.W. Staats, Ph.D.—learning, language development

Applicants for the M.Ed. and Ph.D. programs in educational psychology must present a minimum of 18 semester hours in professional education courses. Twelve of these hours must be comprised of work in educational psychology or psychology and include courses in developmental psychology, psychological foundations in education and tests and measurements.

A minimum of 3 units in philosophy of education or



history of education is required. This requirement may be met by the undergraduate course Foundations of American Education, or its equivalent.

### M.Ed.\*

At the time the student applies for admission to the program, the results of the Graduate Record Examination and the Miller Analogies Test must be submitted. Advancement to candidacy is based on the quality of the student's work in the first semester of courses.

Areas of study offered: counseling and guidance, college student personnel, learning, measurement, and research methods. The curriculum in counseling and guidance meets certification requirements of the Hawaii State Department of Education.

Plan A requires a minimum of 24 credit hours in a planned and approved sequence of courses, 18 of which will normally be in educational psychology, and 6 hours of thesis research.

Plan B requires a minimum of 30 hours in a planned and approved sequence of courses, 18 of which will normally be in educational psychology.

### Ph.D.\*

The Ph.D. program in educational psychology requires a minimum of three years (six semesters) of graduate study. The master's degree is not ordinarily required as a prerequisite for the Ph.D.; however, the graduate faculty may request potential candidates to complete the master's degree before entering the doctoral program. Two semesters of resident credit may be granted for the master's degree in educational psychology.

The current Ph.D. program in educational psychology offers three emphases: (1) counseling and guidance, (2) learning, and (3) measurement, statistics, and research design. Application for admission to the program must include: (1) the academic record of the candidate, (2) results of the Miller Analogies Test, and the Graduate Record Examination including the Aptitude tests, and an Advanced Achievement Examination, and (3) three letters of recommendation relating to the applicant's academic and professional background. Admission to candidacy for the Ph.D. degree may be granted after (1) one semester's work in the program, (2) satisfactory completion of departmental qualifying examinations, (3) passing the examination in the required foreign language or demonstrating proficiency in computer language. The foreign language requirement is ordinarily French or German; however, the graduate faculty will accept an alternate foreign language if the student can provide appropriate justification.

The advanced work in the major field will principally be comprised of seminars and directed research. The candidate must select one or more minor fields of study. All doctoral students will be expected to serve as re-

search trainees in the Education Research and Development Center for a minimum of one semester.

### EDUCATIONAL PSYCHOLOGY (Ed EP)

- 416 Tests and Measurements (3)
- 429 Introductory Statistics (3)
- 601 Guidance in the School (3)
- 602 Elementary School Guidance (3)
- 604 Occupational Information in Guidance (3)
- 605 Problems of School Adjustment (3)
- 606 Student Personnel Services in Higher Education (3)
- 608 Introduction to Educational Research (3)
- 609 Tests and Inventories in Guidance (3)
- 610 Counseling: Theory and Practice (3)
- 614 Theory and Assessment of Intelligence (3)
- 615 Clinical Assessment of Exceptional Children (3)
- 616 Seminar in the Education of Exceptional Children (3)
  - (1) Mentally Retarded
  - (2) Emotionally Disturbed
  - (3) Learning Disabled
- 629 Educational Statistics (3)
- 640 Programmed Learning (3)
- 645 American College Student (3)
- 655 Learning Language and Intellectual Function (3)
- 672 Advanced Educational Psychology: Learning (3)
- 673 Advanced Educational Psychology: Psycho-Social Development (3)
- 685 Child Learning Laboratory (3)
- 699 Directed Research (v.)
- 701 Seminar in Guidance (3)
  - (1) School Psychology
  - (2) Testing
  - (3) Counseling
  - (4) Vocational
  - (5) Elementary School
  - (6) Administration
  - (7) Group Procedures
  - (8) Philosophical and Social Issues in Guidance
- 702 Group Guidance (3)
- 703 Guidance Practicum (3)
- 708 Educational Research Methods (3)
- 709 Advanced Problems of Educational Measurement and Evaluation (3)
- 710 Counseling: Group Theory and Practice (3)
- 729 Scaling Qualitative Data (3)
- 768 Seminar in Educational Psychology (3)
  - (1) General
  - (2) Learning
  - (3) Measurement
  - (4) Research and Statistics
  - (5) Psycho-Social Development
- 800 Thesis Research (v.)

### Electrical Engineering

#### Graduate Faculty

- B. Kinariwala, Ph.D. (Chairman)—system theory; computing algorithms
- N. Abramson, Ph.D.—information theory; coding theory
- A. Barna, Ph.D.—instrumentation
- R. Chattopadhyay, Ph.D.—optimization
- G. Fang, Ph.D.—acoustics; physical electronics
- N.T. Gaarder, Ph.D.—communication theory; information theory
- B.S.M. Granborg, Ph.D.—automatic control systems; computer applications
- H.H.H. Hwang, Ph.D.—power system analysis; control systems
- F. Koide, Ph.D.—biomedical engineering

\*The departmental requirements are in addition to those of the Graduate Division which are described in the "Academic Information" section of this catalog.

F.F. Kuo, Ph.D.—system theory; computer applications  
 S. Lin, Ph.D.—information theory; error-correcting codes  
 K. Najita, Ph.D.—electromagnetic theory  
 I. Naqvi, Ph.D.—solid state electronics  
 W.W. Peterson, Ph.D.—error-correcting codes; information theory; computers  
 T.H. Roelofs, Ph.D.—radio science; ionospheric physics  
 D. Slepian, Ph.D.—communication theory  
 P.F. Weaver, Ph.D.—radio science; ionospheric physics  
 E.J. Weldon, Jr., Ph.D.—error-correcting codes, data communications; computer applications  
 A. Yen, Ph.D.—control and system optimization  
 P.C. Yuen, Ph.D.—radio science, satellite communications

#### Visiting Faculty

J. Wolf, Ph.D.—coding and communication theory

### M.S.

Intended candidates for the M.S. degree in electrical engineering must present the B.S. degree in electrical engineering or the equivalent. Both Plan A and Plan B require 30 credits in approved technical courses numbered 400 or above of which at least 18 credits must be in electrical engineering. Furthermore, both plans also require 18 credits in courses numbered 600 or above, including at least one graduate seminar in electrical engineering or a related field.

Plan A requires 12 credits in EE 800, Thesis Research, and a minimum of 12 credits in courses numbered 600-799 with a maximum of 2 credits in 699. Plan B requires 18 credits in courses numbered 600-799 with a maximum of 6 credits in 699. All students must be in residence here during the semester in which they receive their degree.

### Ph.D.

Intended candidates for the Ph.D. degree in electrical engineering must present the B.S. degree in electrical engineering or its equivalent.

The Ph.D. student is required to achieve a good, broad understanding of electrical engineering fundamentals and a thorough knowledge, up to its present state, in a chosen special field. The student must perform research in his special field under the guidance of a faculty adviser and present a dissertation which must be an original contribution to electrical engineering. The dissertation must be a scholarly presentation suitable for publication. All Ph.D. students must also participate in a teaching project.

The intended candidate for the Ph.D. degree must take a written qualifying examination covering the electrical engineering fundamentals and must demonstrate a superior understanding of these fundamentals. This examination will be offered about one week before registration every semester and must be taken by all intended Ph.D. candidates before they begin their third semester. A student who does not pass it, with at most one repetition, will be dropped from the Ph.D. program.

After passing the qualifying examination, the student is advanced to candidacy and should have a thesis committee appointed within two semesters. The committee should consist of at least five members, one of whom

must be in a department other than electrical engineering. After appointment of the committee, the student should work out a tentative program of courses which meets with the approval of his committee.

When the student has completed most of his course work but before he undertakes his research, he must pass a comprehensive examination. This consists of an oral examination given by his entire committee, and may be preceded at the discretion of individual committee members by an additional oral or written examination. If the student fails, he may repeat the examination only once, no sooner than three months after the first examination. When the student passes the comprehensive examination, he proceeds with his dissertation research.

At the conclusion of his research, the student writes a dissertation which must be approved by a majority of the thesis committee. Finally, the student must pass an oral examination covering primarily his dissertation.

#### ELECTRICAL ENGINEERING (EE)

411	Introduction to System Analysis (3)
422	Electronic Instrumentation (3)
425	Integrated Circuits (3)
427	Topics in Physical Electronics (3)
435	Power System Analysis (3)
441	Communication Systems (3)
442	Statistical Communication Theory (3)
446	Information Theory and Coding (3)
451	Feedback Control Systems (3)
452	Feedback Control Systems Laboratory (1)
460	Digital Circuits (3)
461	Digital Systems and Computer Design (3)
462	Digital Techniques Laboratory (1)
463	Analog Computers (3)
466	Computer Organization and Programming Techniques (3)
467	Algorithmic Languages (3)
473	Microwave Theory and Techniques (3)
475	Radio-wave Propagation (3)
477	Fundamentals of Radar, Sonar and Navigational Systems (3)
481	Bioelectricity (3)
486	Basic Biomedical Electronics (3)
487	Basic Biomedical Electronics Laboratory (1)
491-492	Special Topics in Electrical Engineering (3-3)
499	Project (1 to 6)
613	Linear System Analysis (3)
614	Analysis of Nonlinear Systems (3)
616	System Theory (3)
617	Computer-Aided Circuit Design (3)
618	System Optimization (3)
623	Advanced Electronic Instrumentation (3)
627	Advanced Topics in Physical Electronics (3)
646	Signal and Noise Theory (3)
647	Applied Statistical Decision Theory (3)
648	Error-Correcting Codes (3)
651	Advanced Feedback Control Systems (3)
652	Optimization Techniques in Control Systems (3)
654	Concepts of Digital System Control (3)
655	Sampled-Data Control Systems (3)
657	Hybrid Automatic Control Systems (3)
660	Computer Organization (3)
661	Theory and Design of Digital Machines (3)
671-672	Electromagnetic Theory and Applications (3-3)
673	Magneto-Ionic Theory (3)
677	Antenna Theory (3)
691-692	Seminar in Electrical Engineering (1-1)
693	Special Topics in Electrical Engineering (3)
699	Directed Reading or Research (v.)
800	Thesis Research (v.)

## Elementary Education

### Graduate Faculty

E.C. Jenkins, Ph.D. (Chairman)—elementary curriculum, supervision, language arts  
 M.C. Austin, Ed.D.—reading and language arts  
 F.G. Braun, Ed.D.—language arts, mathematics education, elementary  
 A.B. Carr, Ed.D.—science education, elementary  
 E.D. Hayes, Ph.D.—creative expression, language arts  
 A.M.S. Inn, Ed.D.—social studies education  
 M. Lang, Ed.D.—social studies, elementary curriculum  
 A.J. Picard, Ph.D.—mathematics education  
 A.L. Pickens, Ed.D.—art education  
 M.E. Reddin, Ph.D.—early childhood education, language arts

Intended candidates for the M.Ed. in elementary education must present a minimum of 18 semester hours in professional education courses and, in addition, credit for supervised student teaching or teaching experience.

Admission to candidacy is based upon (1) the quality of the student's undergraduate record, (2) his performance on the general examination,<sup>†</sup> and (3) personal interview.

**Plan A:** minimum of 30 semester hours, 21-27 in foundation courses, research, and elementary education (of which 6 semester hours are allowed for thesis) and 3-9 semester hours of electives other than elementary education which are related to the candidate's goals. At least one graduate seminar is required.

**Plan B:** minimum of 30 semester hours, 6 in foundations of education, 9-15 in elementary education, and 9-15 in related fields. Additional hours may be required depending upon the student's background in interpreting research, in issues and problems related to the elementary school curriculum, and in academic areas related to the major field of concentration.

Required courses in elementary education are marked with an asterisk below.

### CURRICULUM AND INSTRUCTION (Ed CI)

- 619 Children's Literature in the Elementary Curriculum (3)
- 620 Teaching Reading in the Elementary School (3)
- 621 Modern Language Arts Program, Elementary (3)
- \*622 Elementary School Curriculum (3)
- 623 The Elementary Science Curriculum (3)
- 624 The Elementary Mathematics Curriculum (3)
- 625 The Elementary Social Studies Curriculum (3)
- 626 Art in Elementary Education (3)
- 629 Curriculum Development in Creative Expression (3)
- 640 Seminar in Teaching Fields
- 646 Reading Difficulties
- 647 Clinical Procedures in Reading
- †667 Curriculum Trends in Early Childhood Education (3)
- 699 Directed Research (v.)
- \*722 Seminar in Elementary Curriculum Foundation (3)—Limited to master's candidates
- 800 Thesis Research (v.)

<sup>†</sup>Graduate Record Examination (Aptitude test) to be taken before completing 12 graduate credits but preferably prior to application.

<sup>‡</sup>For those who wish to concentrate on Early Childhood Education CI 667 may be substituted for CI 622.

## English

### Graduate Faculty

J.M. Backus, Ph.D. (Chairman)—American literature  
 A.G. Day, Ph.D. (retired)—consultant in Pacific literature and comparative literature  
 C.S. Bouslog, Ph.D.—English romanticism, 20th-century British and American literature  
 R. Crymes, Ph.D.—modern English grammar  
 A.G. Day, Ph.D. (retired)—consultant in Pacific literature  
 L. Edel, Ph.D.—American literature, psychology  
 A. Friedson, Ph.D.—20th-century literature  
 J.W. Frierson, Ph.D.—Victorian literature  
 T.H. Fujimura, Ph.D.—Restoration literature, drama  
 J.M. Gray, Ph.D.—literary theory  
 W.E. Huntsberry, M.A.—writing  
 J. Kau, Ph.D.—Renaissance  
 R.L. Larson, Ph.D.—rhetoric and composition, Restoration literature  
 A.P. Leib, Ph.D.—American literature, medieval literature, Pacific literature  
 A.J. Levy, Ph.D.—American literature  
 J.K. Lowers, Ph.D.—Elizabethan literature  
 J. Maltby, Ph.D.—modern drama, 18th-century literature  
 E. McCutcheon, Ph.D.—Renaissance and 17th-century literature  
 B. Menikoff, Ph.D.—American literature  
 T. Pak, Ph.D.—language and linguistics  
 Y. Shen, Ed.D.—English language  
 M.C. Solomon, Ph.D.—20th-century literature  
 D. Stempel, Ph.D.—19th-century literature, linguistics, criticism  
 B.M. Stillians, Ph.D.—English romanticism, American literature  
 T.L. Summersgill, Ph.D.—Elizabethan literature, Chaucer  
 T.F. Teevan, Ph.D.—modern English and Irish literature  
 P.R. Thompson, Ph.D.—modern poetry, creative writing  
 L. Wellein, Ph.D.—comparative literature, Old and Middle English  
 L.E. Winters, Ph.D.—comparative literature, Chinese and American literature

Intended candidates for the M.A. in English are expected to have acquired 27 semester hours of undergraduate credit in English or closely related subjects. They are also expected to demonstrate a reading knowledge of an ancient or modern foreign language. Courses for the M.A. are selected mainly from the following list, although advanced courses in other disciplines may be approved. Required courses are: English 401 or 402 (or equivalent); English 630; one seminar in English or American literature.

Since no general examination is required, a student is advanced to candidacy at the satisfactory completion of his first semester of graduate study, after a conference with his adviser. A six-hour written comprehensive examination on English and American literature from medieval times to the present is taken near the end of the program by students in Plan B. Students in Plan A are tested on the same material at a two-hour oral examination following completion of the thesis. Plan A requires 18 credits in courses and 12 for the thesis.

Beginning in September, 1971, the department will also offer Plan C, which allows for a demonstration of competence through examination rather than through course work or thesis. For further information, see the description of Plan C in this bulletin and in the English department's supplementary mimeographed description of its programs.

At present, the department does not offer a Ph.D.

## Elementary Education

### Graduate Faculty

E.C. Jenkins, Ph.D. (Chairman)—elementary curriculum, supervision, language arts  
 M.C. Austin, Ed.D.—reading and language arts  
 F.G. Braun, Ed.D.—language arts, mathematics education, elementary  
 A.B. Carr, Ed.D.—science education, elementary  
 E.D. Hayes, Ph.D.—creative expression, language arts  
 A.M.S. Inn, Ed.D.—social studies education  
 M. Lang, Ed.D.—social studies, elementary curriculum  
 A.J. Picard, Ph.D.—mathematics education  
 A.L. Pickens, Ed.D.—art education  
 M.E. Reddin, Ph.D.—early childhood education, language arts

Intended candidates for the M.Ed. in elementary education must present a minimum of 18 semester hours in professional education courses and, in addition, credit for supervised student teaching or teaching experience.

Admission to candidacy is based upon (1) the quality of the student's undergraduate record, (2) his performance on the general examination,<sup>†</sup> and (3) personal interview.

**Plan A:** minimum of 30 semester hours, 21-27 in foundation courses, research, and elementary education (of which 6 semester hours are allowed for thesis) and 3-9 semester hours of electives other than elementary education which are related to the candidate's goals. At least one graduate seminar is required.

**Plan B:** minimum of 30 semester hours, 6 in foundations of education, 9-15 in elementary education, and 9-15 in related fields. Additional hours may be required depending upon the student's background in interpreting research, in issues and problems related to the elementary school curriculum, and in academic areas related to the major field of concentration.

Required courses in elementary education are marked with an asterisk below.

### CURRICULUM AND INSTRUCTION (Ed CI)

- 619 Children's Literature in the Elementary Curriculum (3)
- 620 Teaching Reading in the Elementary School (3)
- 621 Modern Language Arts Program, Elementary (3)
- \*622 Elementary School Curriculum (3)
- 623 The Elementary Science Curriculum (3)
- 624 The Elementary Mathematics Curriculum (3)
- 625 The Elementary Social Studies Curriculum (3)
- 626 Art in Elementary Education (3)
- 629 Curriculum Development in Creative Expression (3)
- 640 Seminar in Teaching Fields
- 646 Reading Difficulties
- 647 Clinical Procedures in Reading
- †667 Curriculum Trends in Early Childhood Education (3)
- 699 Directed Research (v.)
- \*722 Seminar in Elementary Curriculum Foundation (3)—Limited to master's candidates
- 800 Thesis Research (v.)

<sup>†</sup>Graduate Record Examination (Aptitude test) to be taken before completing 12 graduate credits but preferably prior to application.

<sup>‡</sup>For those who wish to concentrate on Early Childhood Education CI 667 may be substituted for CI 622.

## English

### Graduate Faculty

J.M. Backus, Ph.D. (Chairman)—American literature  
 G.L. Anderson, Ph.D.—18th century literature, Asian and comparative literature  
 C.S. Bouslog, Ph.D.—English romanticism, 20th-century British and American literature  
 R. Crymes, Ph.D.—modern English grammar  
 A.G. Day, Ph.D. (retired)—consultant in Pacific literature  
 L. Edel, Ph.D.—American literature, psychology  
 A. Friedson, Ph.D.—20th-century literature  
 J.W. Frierson, Ph.D.—Victorian literature  
 T.H. Fujimura, Ph.D.—Restoration literature, drama  
 J.M. Gray, Ph.D.—literary theory  
 W.E. Huntsberry, M.A.—writing  
 J. Kau, Ph.D.—Renaissance  
 R.L. Larson, Ph.D.—rhetoric and composition, Restoration literature  
 A.P. Leib, Ph.D.—American literature, medieval literature, Pacific literature  
 A.J. Levy, Ph.D.—American literature  
 J.K. Lowers, Ph.D.—Elizabethan literature  
 J. Maltby, Ph.D.—modern drama, 18th-century literature  
 E. McCutcheon, Ph.D.—Renaissance and 17th-century literature  
 B. Menikoff, Ph.D.—American literature  
 T. Pak, Ph.D.—language and linguistics  
 Y. Shen, Ed.D.—English language  
 M.C. Solomon, Ph.D.—20th-century literature  
 D. Stempel, Ph.D.—19th-century literature, linguistics, criticism  
 B.M. Stillians, Ph.D.—English romanticism, American literature  
 T.L. Summersgill, Ph.D.—Elizabethan literature, Chaucer  
 T.F. Teevan, Ph.D.—modern English and Irish literature  
 P.R. Thompson, Ph.D.—modern poetry, creative writing  
 L. Wellein, Ph.D.—comparative literature, Old and Middle English  
 L.E. Winters, Ph.D.—comparative literature, Chinese and American literature

Intended candidates for the M.A. in English are expected to have acquired 27 semester hours of undergraduate credit in English or closely related subjects. They are also expected to demonstrate a reading knowledge of an ancient or modern foreign language. Courses for the M.A. are selected mainly from the following list, although advanced courses in other disciplines may be approved. Required courses are: English 401 or 402 (or equivalent); English 630; one seminar in English or American literature.

Since no general examination is required, a student is advanced to candidacy at the satisfactory completion of his first semester of graduate study, after a conference with his adviser. A six-hour written comprehensive examination on English and American literature from medieval times to the present is taken near the end of the program by students in Plan B. Students in Plan A are tested on the same material at a two-hour oral examination following completion of the thesis. Plan A requires 18 credits in courses and 12 for the thesis.

Beginning in September, 1971, the department will also offer Plan C, which allows for a demonstration of competence through examination rather than through course work or thesis. For further information, see the description of Plan C in this bulletin and in the English department's supplementary mimeographed description of its programs.

At present, the department does not offer a Ph.D.

F.F. Kuo, Ph.D.—system theory; computer applications  
 S. Lin, Ph.D.—information theory; error-correcting codes  
 K. Najita, Ph.D.—electromagnetic theory  
 I. Naqvi, Ph.D.—solid state electronics  
 W.W. Peterson, Ph.D.—error-correcting codes; information theory; computers  
 T.H. Roelofs, Ph.D.—radio science; ionospheric physics  
 D. Slepian, Ph.D.—communication theory  
 P.F. Weaver, Ph.D.—radio science; ionospheric physics  
 E.J. Weldon, Jr., Ph.D.—error-correcting codes, data communications; computer applications  
 A. Yen, Ph.D.—control and system optimization  
 P.C. Yuen, Ph.D.—radio science, satellite communications

#### Visiting Faculty

J. Wolf, Ph.D.—coding and communication theory

### M.S.

Intended candidates for the M.S. degree in electrical engineering must present the B.S. degree in electrical engineering or the equivalent. Both Plan A and Plan B require 30 credits in approved technical courses numbered 400 or above of which at least 18 credits must be in electrical engineering. Furthermore, both plans also require 18 credits in courses numbered 600 or above, including at least one graduate seminar in electrical engineering or a related field.

Plan A requires 12 credits in EE 800, Thesis Research, and a minimum of 12 credits in courses numbered 600-799 with a maximum of 2 credits in 699. Plan B requires 18 credits in courses numbered 600-799 with a maximum of 6 credits in 699. All students must be in residence here during the semester in which they receive their degree.

### Ph.D.

Intended candidates for the Ph.D. degree in electrical engineering must present the B.S. degree in electrical engineering or its equivalent.

The Ph.D. student is required to achieve a good, broad understanding of electrical engineering fundamentals and a thorough knowledge, up to its present state, in a chosen special field. The student must perform research in his special field under the guidance of a faculty adviser and present a dissertation which must be an original contribution to electrical engineering. The dissertation must be a scholarly presentation suitable for publication. All Ph.D. students must also participate in a teaching project.

The intended candidate for the Ph.D. degree must take a written qualifying examination covering the electrical engineering fundamentals and must demonstrate a superior understanding of these fundamentals. This examination will be offered about one week before registration every semester and must be taken by all intended Ph.D. candidates before they begin their third semester. A student who does not pass it, with at most one repetition, will be dropped from the Ph.D. program.

After passing the qualifying examination, the student is advanced to candidacy and should have a thesis committee appointed within two semesters. The committee should consist of at least five members, one of whom

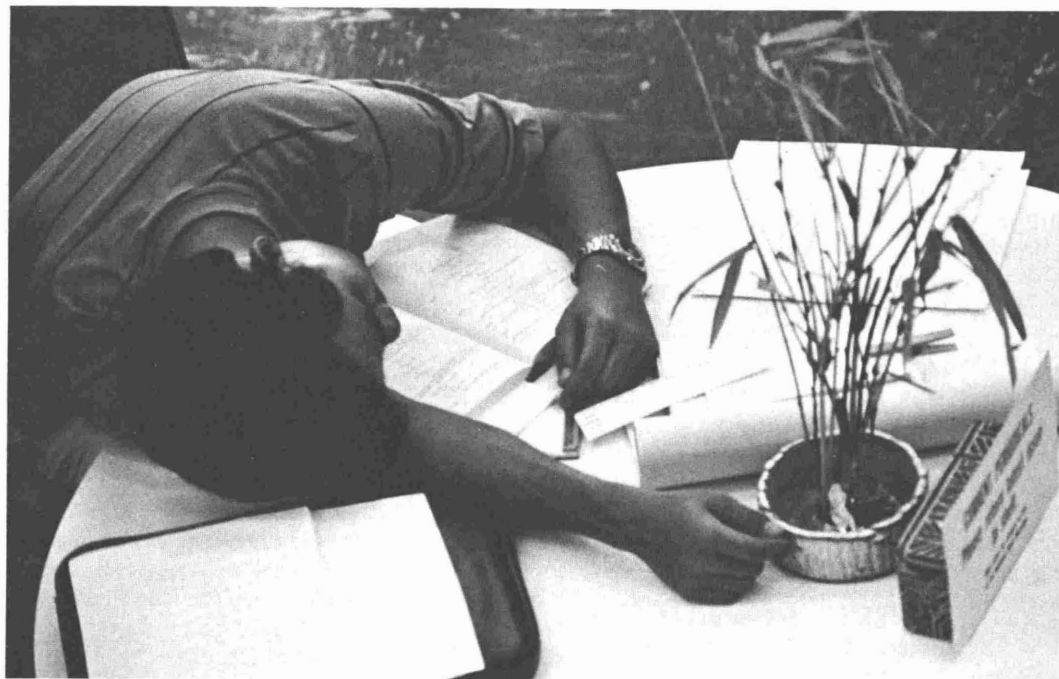
must be in a department other than electrical engineering. After appointment of the committee, the student should work out a tentative program of courses which meets with the approval of his committee.

When the student has completed most of his course work but before he undertakes his research, he must pass a comprehensive examination. This consists of an oral examination given by his entire committee, and may be preceded at the discretion of individual committee members by an additional oral or written examination. If the student fails, he may repeat the examination only once, no sooner than three months after the first examination. When the student passes the comprehensive examination, he proceeds with his dissertation research.

At the conclusion of his research, the student writes a dissertation which must be approved by a majority of the thesis committee. Finally, the student must pass an oral examination covering primarily his dissertation.

### ELECTRICAL ENGINEERING (EE)

411	Introduction to System Analysis (3)
422	Electronic Instrumentation (3)
425	Integrated Circuits (3)
427	Topics in Physical Electronics (3)
435	Power System Analysis (3)
441	Communication Systems (3)
442	Statistical Communication Theory (3)
446	Information Theory and Coding (3)
451	Feedback Control Systems (3)
452	Feedback Control Systems Laboratory (1)
460	Digital Circuits (3)
461	Digital Systems and Computer Design (3)
462	Digital Techniques Laboratory (1)
463	Analog Computers (3)
466	Computer Organization and Programming Techniques (3)
467	Algorithmic Languages (3)
473	Microwave Theory and Techniques (3)
475	Radio-wave Propagation (3)
477	Fundamentals of Radar, Sonar and Navigational Systems (3)
481	Bioelectricity (3)
486	Basic Biomedical Electronics (3)
487	Basic Biomedical Electronics Laboratory (1)
491-492	Special Topics in Electrical Engineering (3-3)
499	Project (1 to 6)
613	Linear System Analysis (3)
614	Analysis of Nonlinear Systems (3)
616	System Theory (3)
617	Computer-Aided Circuit Design (3)
618	System Optimization (3)
623	Advanced Electronic Instrumentation (3)
627	Advanced Topics in Physical Electronics (3)
646	Signal and Noise Theory (3)
647	Applied Statistical Decision Theory (3)
648	Error-Correcting Codes (3)
651	Advanced Feedback Control Systems (3)
652	Optimization Techniques in Control Systems (3)
654	Concepts of Digital System Control (3)
655	Sampled-Data Control Systems (3)
657	Hybrid Automatic Control Systems (3)
660	Computer Organization (3)
661	Theory and Design of Digital Machines (3)
671-672	Electromagnetic Theory and Applications (3-3)
673	Magneto-Ionic Theory (3)
677	Antenna Theory (3)
691-692	Seminar in Electrical Engineering (1-1)
693	Special Topics in Electrical Engineering (3)
699	Directed Reading or Research (v.)
800	Thesis Research (v.)



## ENGLISH (Eng)

- 401 Modern English Grammar (3)  
 402 History of the English Language (3)  
 404 English Phonology (3)  
 408 History of Rhetoric (3)  
 421 English Drama to 1642 (3)  
 431,432 The English Novel (3,3)  
 433 Twentieth-Century British Novel (3)  
 442 Chaucer (3)  
 445,446 Shakespeare (3,3)  
 447 Milton (3)  
 451 Medieval English Literature (3)  
 453 Sixteenth-Century English Literature (3)  
 454 Early Seventeenth-Century English Literature (3)  
 456 Restoration Literature (3)  
 457,458 Eighteenth-Century English Literature (3,3)  
 461 The Romantic Movement in England (3)  
 463,464 Victorian Literature (3,3)  
 469 Studies in British Literature (3)  
 471,472 American Literature (3,3)  
 475,476 American Novel (3,3)  
 479 Studies in American Literature (3)  
 480 Literature of the Pacific (3)  
 482 Narratives of Oral Tradition (3)  
 483,484 Modern Dramatic Literature (3,3)  
 487 Twentieth-Century British and American Poetry (3)  
 610 Rhetoric: Theories and Applications (3)  
 630 Seminar in Research Methods (3)  
 637,638 History of Literary Criticism (3,3)  
 640 Old English (3)  
 660 Major Authors (3)  
 675 Literary Genres and Problems (3)  
 735 Seminar in Comparative Literature (3)  
 745 Seminar in English Language (3)  
 757 Seminar in Shakespeare (3)  
 775 Seminar in English Literature (3)  
 780 Seminar in American Literature: Authors (3)  
 785 Seminar in American Literature: Problems, Periods (3)  
 790 Seminar in Teaching Composition (3)  
 791 Student Teaching of College Composition (3)  
 799 Directed Research (v.)  
 800 Thesis Research (v.)

## English as a Second Language

*Graduate Faculty*

- M.P. Lester, Ph.D. (Chairman)—English Language  
 R.H. Crymes, Ph.D.—Practicum and English Language  
 G. Dykstra, Ph.D.—Practicum  
 M. Higa, Ed.D.—Language Acquisition  
 K. Jackson, Ed.D.—Practicum  
 R. Krohn, Ph.D.—Practicum and English Language  
 C.W. Mason, Ph.D.—Practicum  
 T.H. Plaister, M.A.—Practicum  
 T.S. Rodgers, Ph.D.—Language Acquisition  
 D. Steinberg, Ph.D.—Language Acquisition  
 R. Whitman, Ph.D.—Practicum and English Language

The M.A. program in teaching English as a second language is designed to prepare specialists in this field. The department offers both Plan B (nonthesis) and Plan C (see below).

**Plan B**

*Undergraduate Preparation:* Since there is no undergraduate program in teaching English as a second language in most schools, American students come into the program from a wide variety of backgrounds. Students whose native language is not English are expected to have majored in English (language and/or literature). American students who have had no literature courses are admitted with an undergraduate deficiency and must take 6 units of work in literature in addition to the required 30 units. Students who have not had a course in the formal study of language (e.g., an introductory course in linguistics or the English language) are admitted with an undergraduate deficiency and must take either ESL 350 or Linguistics 320 during the first semester.



The GRE Aptitude Test (the "morning" part) is recommended for all American students. However, for those American students who apply for graduate assistantships and/or East-West Center grants, the GRE Aptitude Test is required.

**Curriculum:** This is a 30-credit, nonthesis program, the completion of which normally requires two semesters and a summer of full-time study. The program is divided into three areas: practicum, English language and linguistics, and language acquisition. The first area, the practicum, deals with methods and materials of teaching English as a second language. Included in this area are all courses of an applied or pedagogical nature. The second area, English language and linguistics, deals with the phonology and grammar of modern English as well as linguistic theory. The third area, language acquisition, deals with the psychological and social factors that are relevant to an understanding of how a second language is learned. The emphasis placed on theory and research in language acquisition is a distinctive characteristic of this program.

ENGLISH AS A SECOND LANGUAGE (ESL)  
(all courses carry 3 units of credit)

Area I Practicum (9 units required)

*Required*

- 610 Teaching English as a Second Language  
710 Materials Selection and Adaptation  
or  
711 New Materials Development  
730 Seminar in Teaching English as a Second Language

*Elective*

- 425 Reading  
613 Experimentation in Language Acquisition and Modification  
640 Contrastive Analysis and Linguistic Universals  
720 Second Language Testing  
799 Directed Research

Area II English Language and Linguistics (6 units required)

*Required*

- 450 English Syntax  
460 English Phonology

*Elective*

- 360 The English Language in Hawaii  
451 English Syntax (Second semester of ESL 450)

Area III Language Acquisition (6 units required)

*Required*

- 650 Survey of Psycholinguistics with Reference to 2nd Language Acquisition  
660 Introduction to Socio-& Ethno-linguistics with Reference to 2nd Language Acquisition

or

- 670 Comparison of 1st and 2nd Language Acquisition

**Examinations:** The program requires two examinations; a general examination given at the beginning of the second semester to determine advancement to candidacy and a comprehensive examination given during the last semester. The comprehensive consists of two parts: a written examination covering Areas II and III, and the presentation and defense of a project undertaken as part of ESL 730, Seminar in Teaching English as a Second Language.

**Language Requirements:** Non-native speakers of English (foreign students) are expected to have a score

of 550 or higher on the Test of English as a Foreign Language (TOEFL). Foreign students are expected to compete with American students without the benefit of double standards.

Native speakers of English are required to have *two* semesters of college level study of an Asian or Pacific language or the equivalent; *or* to have had two years residency in an Asian or Pacific country; *or* to have successfully completed the Peace Corps Language Training Program in an Asian or Pacific language. If the student has not already satisfied this requirement upon entrance into the program, he should plan to take an intensive language course during the summer. Foreign languages other than Asian and Pacific languages may meet the requirement, but the student must be able to justify the substitution.

Additional information relating to the matters discussed above, and to further program requirements, is contained in a program brochure. Those considering entry into the program are urged to request this brochure from the chairman of the department of English as a second language, before applying for admission to the Graduate Division. Entrance into the program is permitted in the fall, spring, and summer.

### Plan C

Plan C is available to applicants who meet the following additional qualifications:

- a) They must be fluent speakers of English.
- b) They must have had a minimum of five years full-time experience working in the field of teaching English as a second language.
- c) During the five years they must have had at least two years of administrative, teacher training, or materials development responsibility.
- d) They must have had an outstanding academic record and a high performance on the Graduate Record Examination.

Students enrolled under Plan C are exempted from the 30-credit requirement (but not from the residency requirement). The exact nature of the student's program will be determined after his arrival. Students in Plan C must take a final oral examination in addition to the comprehensive examination described in Plan B. For further details see Plan B.

## Entomology

### Graduate Faculty

- W.C. Mitchell, Ph.D. (Chairman)—economic entomology  
J.W. Beardsley, Jr., Ph.D.—biological control, systematics  
H.A. Bess, Ph.D.—biological control and ecology  
W. Carter, Ph.D. (Professor Emeritus)—insect transmission of plant pathogens  
F. Chang, Ph.D.—insect physiology  
M.D. Delfinado, Ph.D.—systematics  
F.H. Haramoto, Ph.D.—acarology  
D.E. Hardy, Ph.D.—taxonomy, medical entomology  
A.A. LaPlante, Ph.D.—extension entomology

R. Namba, Ph.D.—insect transmission of plant pathogens  
 T. Nishida, Ph.D.—ecology and biological control  
 M. Sherman, Ph.D.—toxicology  
 M. Tamashiro, Ph.D.—insect pathology

*Affiliate Faculty*

D.L. Chambers, Ph.D.—insect behavior and physiology—fruit flies  
 V.C.S. Chang, Ph.D.—insect behavior and insect transmission  
 of plant pathogens  
 C.J. Davis, B.S.—biological control  
 J.L. Gressitt, Ph.D.—taxonomy  
 C.R. Joyce, Ph.D.—medical entomology  
 A.K. Ota, Ph.D.—applied entomology and ecology  
 F.J. Radovsky, Ph.D.—acarology  
 K. Sakimura, B.S.—pineapple insects  
 W.A. Steffan, Ph.D.—taxonomy

The department offers the master of science and doctor of philosophy degrees in entomology with specialization in acarology, biological control of insect and weed pests, insect ecology, insect pathology, insect toxicology, insect transmission of plant pathogens, medical and veterinary entomology, systematics and tropical economic entomology.

The unique geographical location of Hawaii is especially favorable for entomological research on ecological and phylogenetic studies related to geographical isolation. Many of our insect species have been accidentally introduced from all parts of the world and the endemic and exotic elements of our insect fauna provide unique opportunities for the study of adaptation of a species to new surroundings. Furthermore, our location is suitable for studies on insects of the tropical areas of the Pacific and Orient.

The department offers a master's degree program under either Plan A (thesis) or Plan B (nonthesis). All master's degree candidates are first enrolled under Plan A, the thesis program. Under certain circumstances it is advisable for students to change to Plan B. However, no student can change to Plan B, or vice-versa, without the approval of his committee. Under Plan A, a minimum of 16 semester hours of course work, 2 semester hours of directed research, 2 semester hours of seminar and 10 semester hours of thesis research will be required. Under Plan B, a minimum of 26 semester hours of course work, 2 semester hours of directed research and 2 semester hours of seminar will be required. A final oral examination is required for students under Plan A and Plan B.

Intended candidates for the M.S. or Ph.D. in entomology must present a minimum of 18 hours of undergraduate credit in entomology and zoology, including general zoology, general entomology, economic entomology, insect morphology, and systematic entomology. In addition, they should have credit for two years of chemistry (including inorganic and organic), and courses in algebra, botany, genetics, and physics. Deficiencies in undergraduate preparation must be made up.

Courses available for graduate credit are listed below. Courses in the fields of zoology, horticulture, plant pathology, chemistry, botany, microbiology, genetics, and related sciences, may be allowed in the degree program.



ENTOMOLOGY (Ent)

- 641 Insect Physiology (4)
- 661 Medical and Veterinary Entomology (3)
- 662 Advanced Systematic Entomology (3)
- 664 Immature Insects (3)
- 671 Insect Ecology (3)
- 672 Acarology (3)
- 673 Insect Pathology (3)
- 675 Biological Control of Pests (3)
- 680 Insect Toxicology (4)
- 686 Insect Transmission of Plant Pathogens (3)
- 687 Entomology Seminar (1)
- 699 Directed Research (v.)
- 800 Thesis Research (v.)

## Food Science

### Graduate Faculty

H.Y. Yamamoto, Ph.D. (Chairman)—food and plant biochemistry  
 A. Bevenue, B.S.—pesticide residues  
 C.G. Cavaletto, M.S.—sensory evaluation  
 H.A. Frank, Ph.D.—food microbiology  
 F.S. Hing, Ph.D.—food technology and engineering  
 J.W. Hylin, Ph.D.—pesticide metabolism  
 H. Matsumoto, Ph.D.—food toxicology  
 J.H. Moy, Ph.D.—food engineering, food irradiation, processing technology  
 T. Nakayama, Ph.D.—food chemistry

### Affiliate Faculty

J.E. Brekke, M.S.—fruit chemistry and processing technology  
 H.T. Chan, Jr., Ph.D.—food biochemistry  
 A.M. Dollar, Ph.D.—food biochemistry  
 G.E. Felton, Ph.D.—food technology, carbohydrate chemistry

The department offers a master's degree program under either Plan A (thesis) or Plan B (nonthesis). Intended candidates must present a minimum undergraduate preparation of two and a half years of chemistry (including analytical and organic chemistry), one year of physics, credits in biological sciences (including general microbiology), and college algebra and trigonometry. All students must pass an oral general examination before being advanced to candidacy.

60

Under Plan A, a minimum of 18 semester hours of course work and 12 semester hours of thesis research will be required. Thesis work in food science includes the following areas: food technology, biochemistry, chemistry, microbiology, engineering, food irradiation, food safety, processing of seafoods, tropical and Asian food products. A final oral examination, covering the thesis and related areas, is required for students under Plan A.

Under Plan B, a minimum of 30 semester hours of course work is required. A final oral examination, consisting of a seminar appearance, is required for students under Plan B.

Courses for the graduate program are to be selected from those offered in the major field of food science and in the related fields of agricultural engineering, chemistry, biochemistry and biophysics, microbiology and nutrition. Courses required for all candidates are marked with an asterisk.

### FOOD SCIENCE (FdSc)

- 401 Food Processing (3)
- 403 Microbiology of Foods (3)
- 411 Food Engineering (3)
- 430 Food Chemistry (3)
- 604 Special Topics in Food Microbiology (v.)
- 610 Advanced Food Processing (3)
- \*620 Seminar (1)
- 630 Food Fermentation (3)
- 640 Food Safety (2)
- 699 Directed Research (v.)
- \*701 Recent Advances in Food Research (1)
- 730 Biochemical and Chemical Aspects of Foods (3)
- 800 Thesis Research (v.)

## French

### Graduate Faculty

D.B. Aspinwall, Ph.D. (Chairman)—poetry, 20th-century literature  
 E. Jackson, Ph.D.—novel, criticism, 19th-century prose  
 J. Lusseyran, Lic. es lettres—18th-century literature, theatre  
 H. Niedzielski, Ph.D.—medieval language and literature, phonetics  
 M. Baciú, Doct. de l'Univ.—theatre of absurd, surrealism  
 M. Ignatius, Ph.D.—medieval, 20th-century literature

Plan A (thesis) and Plan B (non-thesis), outlined below, are designed to meet the needs of two different types of students. Plan A is primarily intended for those who plan to work for a doctorate and for whom it is desirable to have the experience of writing a thesis. Plan B is primarily intended for those for whom additional course work in linguistics and methodology of language teaching may be more valuable than thesis research. Normally, all candidates in both plans are required to take 10-12 credits in French literary courses. Reading proficiency in a second foreign language is to be demonstrated by passing the examination stipulated by the Graduate Division. Some Latin is desirable. It is to be recognized that all specified requirements are minimal. A program for each individual will be worked out on the basis of the results of the preliminary conference and general examination.

Requirements for admission, in addition to those of the Graduate Division are: (1) 3.0 average in French although applicants with somewhat lower averages may be admitted provisionally; (2) 24 credits of French (or equivalent) beyond the intermediate level; (3) acceptable accent and fluency as demonstrated in a personal interview or by a tape recording as specified by the department; (4) acceptable scores on the advanced French Literature section of the Graduate Record Examinations.

Under Plan A degree requirements include 30 credit hours: a minimum of 24 hours of course work and a minimum of 6 hours thesis research. Of these, a minimum of 12 hours, exclusive of research methods course, must be in French courses numbered 600-799, including at least one graduate seminar. 4 to 6 credits of European history if not taken as an undergraduate, are required as well as EL 630 (Research Methods), and Fr 661 (Stylistics). Graduate assistants are required to take Ed CI 640 (Methods of Teaching French). Additional requirements are written and oral comprehensive examinations, thesis, a superior score in the four language skill areas of the MLA Teacher Proficiency Examinations. Up to 8 credits in related fields may be elected.

Under Plan B degree requirements include 30 hours of course work of which a minimum of 12 credits exclusive of research methods and Fr 661 (Stylistics) must be earned in French courses numbered 600-799 including at least one graduate seminar. 4 to 6 credits of European history if not taken as an undergraduate are required as well as EL 630 (Research Methods),



Fr 661 (Stylistics), Ed CI 640 (Methods of Teaching French) and EP 416 (Tests and Measurements). Additional requirements are written and oral comprehensive examinations, presentation of a seminar paper, superior scores in seven areas of the MLA Teacher Proficiency Examinations. Up to 8 credits in related fields may be elected.

#### FRENCH (Fr)

- 407 Introduction to Medieval Language and Civilization (3)
- 408 Masterpieces of Medieval Literature (3)
- 410 Masterpieces of 16th-Century Literature (3)
- 411-412 Masterpieces of 17th-Century Literature (3-3)
- 413 Masterpieces of 18th-Century Literature (3)
- 415-416 Masterpieces of 19th-Century Literature (2-2)
- 420 20th-Century French Novel (3)
- 421 20th-Century French Theatre (3)
- 422 20th-Century French Poetry (3)
- 425 Current French Literature (3)
- 491 Seminar in French Literature (3)
- 601 Seminar in 20th-Century French Literature (3)
- 602 Seminar in French Poetry (3)
- 605 French Prose Literature of the Last 30 Years (3)
- 609 French Renaissance (3)
- 620 Masterpieces of the 17th Century (3)
- 651 Philosophic Currents of the 18th Century (3)
- 661 Stylistics (3)
- 666 Seminar in History of French Literary Criticism (2)
- 671 History of the Language (4)
- 672 Medieval Literature (2)
- 681 The Novel in France (3)
- 685 Seminar in Realism in French Literature (3)
- 690 The Theatre in France (3)
- 699 Directed Research (v.)
- 735 Seminar in French Literature (3)
- 800 Thesis Research (v.)

#### EUROPEAN LANGUAGES (EL)

- 610 Contrastive Analysis of French and Spanish with English (3)
- 630 Seminar in Research Methods (1)

#### CURRICULUM AND INSTRUCTION (Ed CI)

- 640 Seminar in Teaching Fields (3)

## Genetics

### Graduate Faculty

- G.C. Ashton, Ph.D., D.Sc. (Chairman)—genetic polymorphisms
- D. Arakaki, D.Sc.—cytogenetics
- S. Bintliff, M.D.—genetics counseling
- H. Carson, Ph.D.—ecological genetics
- C.S. Chung, Ph.D.—human genetics
- J.A. Hunt, Ph.D.—biochemical genetics
- M.P. Mi, Ph.D.—statistical genetics
- Y.K. Paik, Ph.D.—population genetics
- M.N. Rashad, M.D., Ph.D.—medical genetics
- M. Rosenberg, Ph.D.—poultry genetics
- D. Vann, Ph.D.—immunogenetics

### Affiliate Faculty

- K. Fujino, Ph.D.—immunogenetics
- S.L. Halperin, Ph.D.—genetical psychology
- W.K.T. Shim, M.D.—pediatric genetics
- J.B. Smith, Ph.D.—cytogenetics
- S.H. Waxman, M.D.—cytogenetics

Both M.S. and Ph.D. degrees in genetics are offered, but departmental policy is to accept only those students whose intention is to work towards the Ph.D. degree. The required course work for both degrees is the same, namely Genetics 480, 618, 650, 4 semesters of 654 and Biochemistry 605. The M.S. may be completed only under Plan A. The M.S. thesis counts as 10 units of credit. The Ph.D. is completed by submission of an acceptable dissertation. Normally candidates for a degree in genetics would work through the M.S. to a Ph.D. However candidates with an M.S. in an appropriate discipline may register for the Ph.D. program. Also, exceptional candidates may bypass the M.S. degree. A qualifying examination is required for the Ph.D. degree.

Candidates are expected to indicate their main areas of interest before acceptance by the department, and are

assigned tentatively to their major professors before admission. However, this does not preclude subsequent reassignment if the student and professors concerned agree. A departmental brochure giving further details is available on request from the department chairman.

Intended candidates must have or acquire adequate preparation in biology, calculus, chemistry through organic chemistry, genetics, and physics. Additional preparation will depend on the area of genetics in which the candidate wishes to do his thesis or dissertation research. For population genetics and statistical genetics an adequate mathematical background is desirable. The Graduate Record Examination (aptitude and advanced test in biology) and two letters of recommendation are required of all applicants.

#### GENETICS (Genet)

- 451 Principles of Genetics (3)
- 452 Genetics Laboratory (1)
- 480 Molecular Genetics (3)
- 611 Genetics for Medical Students (2)
- 618 Cytogenetics (3)
- 625 Advanced Topics in Genetics (2)
- 650 Population Genetics (3)
- 654 Seminar (1)
- 660 Statistical Methodology in Genetics (3)
- 671 Techniques in Human Genetics (3)
- 672 Techniques in Human Genetics (3)
- 699 Directed Research (v.)
- 702 Human Polymorphisms and Immunogenetics (4)
- 712 Genetic Risk Analysis (3)
- 800 Thesis Research (v.)

62

## Geography

### Graduate Faculty

- R.J. Fuchs, Ph.D. (Chairman)—economic and urban geography, Soviet Union
- R.W. Armstrong, Ph.D.—medical geography, human ecology, quantitative methods
- O.W. Bach, Ph.D.—urban climatology, air pollution meteorology and climatology
- N.M. Bowers, Ph.D.—South Asia, Micronesia, political geography
- J.H. Chang, Ph.D.—climatology, China (on leave 1971-72)
- S.D. Chang, Ph.D.—China, cartography, airphoto and image interpretation
- M. Chapman, Ph.D.—population, mobility systems, Melanesia
- W.C. Clarke, Ph.D.—cultural ecology and primitive agricultural systems (on leave 1971-72)
- R.J. Earickson, Ph.D.—social and urban geography, theoretical models and quantitative methods
- D.W. Fryer, Ph.D.—economic development, Southeast Asia
- J.R. Healy, Ph.D.—cultural geography, Southeast Asia, Hawaii
- D.H. Kornhauser, Ph.D.—Japan, urbanization and impacts of technological change
- C.A. Manchester, Jr., Ph.D.—Japan, history of geographic thought, historical geography
- B.J. Murton, Ph.D.—man-environment decision making, tropical agriculture, South Asia
- P.N.D. Pirie, Ph.D.—population geography, Pacific
- F.R. Pitts, Ph.D.—cultural geography, East Asia, computer applications (on leave 1971-72)
- P.J. Schwind, Ph.D.—urban and regional systems, analysis and planning

- A.R. Sommarstrom, Ph.D.—environmental quality, conservation, recreation
- J.M. Street, Ph.D.—tropical biogeography and agricultural geography, New Guinea
- H.J. Wiens, Ph.D.—cultural and historical geography of China, regional geography of Asia and the Pacific Islands

### Affiliate Faculty

- R.M. Pearce, Ph.D.—political geography, Southeast Asia

The department offers programs of graduate study and research leading to the M.A. and Ph.D. degrees. Faculty interests and supporting strengths of the University provide advantages for study of the following topics:

**Physical Geography—Environmental Analysis:** agricultural climatology, air pollution climatology, biogeography and soils geography, tropical environments.

**Man-environment Systems:** human and cultural ecology, resource perception and management, population and medical geography.

**Social Geography:** spatial analysis of social behavior, mobility systems, innovation diffusion.

**Economic Geography and Development Problems:** tropical agriculture, urban and regional systems, migration and development.

**East, Southeast, South Asia and the Pacific.**

**Field, quantitative and computer methods; model building.**

Students are encouraged to decide early upon their fields of specialization. They must expect to cross disciplinary lines and incorporate within their programs considerable work in related fields.

Acceptable program specializations must be drawn from departmental specializations and may include:

- 1) a systematic field and an Asian or Pacific region  
or
- 2) two systematic fields  
or
- 3) a systematic field and mathematical-quantitative applications.

### M.A.

Applicants for admission to the M.A. program in geography must provide the following information: (1) two transcripts; (2) Graduate Record Examination scores (aptitude tests only); (3) completed application forms (available from the department and the Graduate Division); (4) three letters of reference.

Applicants are expected to have had a broadly based undergraduate education encompassing basic courses in the physical sciences, social sciences and humanities, and a reading knowledge of a foreign language. Intended candidates for the M.A. or Ph.D. need not have had an undergraduate major in geography; students from related fields are welcome. Any subject area weakness of incoming students must be remedied by independent reading, or by audit or credit courses.

The department offers both Plan A (thesis) and Plan B (nonthesis) programs. The appropriate program is determined on the basis of the student's professional and vocational goals. Plan A requires 21 semester hours and a thesis worth an additional 9 hours. Plan B requires 30 semester hours and the submission of three research papers of thesis quality, but not thesis length. The research papers must have been previously prepared in research seminars.

The master's candidate should acquire (1) a basic knowledge of concepts and theory in the major fields of geography; (2) basic competence in research design and techniques; (3) a beginning specialization in two sub-fields of geography. In consultation with the adviser, the candidate will plan a coherent study program of departmental offerings and pertinent courses from other departments. All students are required to take Geography 695-6 and 791. Also required is a quantitative methods course (Geography 380) or alternatively the candidate may pass the final examination for the course.

All candidates will be tested for their fields of specialization in an oral general examination; in the case of Plan A candidates the exam will extend to the proposed thesis problem. The Plan A candidates will defend the completed thesis in a departmental seminar; the Plan B student will present and defend one of the submitted research papers.

#### Ph.D.

Admission to the Ph.D. program is highly selective and based upon demonstrated competence in previous work and promise of research ability. Applicants must submit the materials required for M.A. admission. Students who have completed M.A. degrees in fields other than geography may be considered for admission to the Ph.D. program. If admitted, however, they must undertake any remedial course work recommended by the department. In their second semester of residence these students shall take an oral qualifying examination covering general physical, cultural, economic and regional geography and geographic methods. A candidate who fails the qualifying examination is irrevocably dropped from candidacy.

The Ph.D. program will consist of advanced courses and research seminars in the department, independent reading and research, and work in related disciplines. There is no formal requirement of a specified number of course units. Each program will be individually prepared by the advisory committee to fit the needs of the student. Each candidate will be expected to have taken the core program required for M.A. candidates, or its equivalent. In addition, common elements of all Ph.D. programs shall include: (1) demonstrated competence in research design, the collection and evaluation of data and geographic model building; (2) adequate work in a supporting discipline(s) related to the fields of specialization in geography to a point where the candidate is familiar with the relevant theory and methods of the other discipline(s); (3) advanced technique competency as may be required by the research topic; (4) a

seminar in the development of geographic thought (Geog 691 or the equivalent).

All Ph.D. candidates must demonstrate competence in a foreign language with an extensive literature in geography; in addition, candidates must demonstrate competence in a second language approved by the advisory committee or, if relevant, offer instead an approved program of advanced work in mathematics and quantitative methods with competence demonstrated by examination.

Written comprehensive examinations are administered covering the fields of specialization. Prior to beginning the dissertation field work, an oral examination is given covering the fields of specialization and the dissertation proposal. As a general rule dissertations will be based on field work. Upon completion of the dissertation the candidate will present and defend his results before the thesis committee and graduate faculty.

#### SYSTEMATIC PHYSICAL GEOGRAPHY

##### GEOGRAPHY (Geog)

- 300 Introduction to Climatology (3)
- 310 Modification of the Biosphere (3)
- 314 Geography of the Tropics (3)
- 400 Advanced Climatology (3)
- 405 Water Resources Management (3)
- 406 Applied Climatology (3)
- 407 Air Pollution Meteorology-Climatology I (3)
- 408 Air Pollution Meteorology-Climatology II (3)
- 415 Medical Geography (3)
- 600 Seminar in Climatology (3)

63

#### SYSTEMATIC HUMAN GEOGRAPHY

- 326 Conservation and Resource Management (3)
- 328 Perspectives on Environment and Culture (3)
- 330 Population Geography (3)
- 335 Political Geography (3)
- 339 Geography of Exploration (3)
- 351 Elements of Regional Science (3)
- 420 Location Theory and Regional Analysis (3)
- 421 Urban Geography (3)
- 423 Urbanization and Urban Problems in Asia (3)
- 425 Spatial Analysis of Social Behavior (3)
- 611 Information Systems and Planning (3)
- 612 Ecological Concepts and Planning (3)
- 620 Regional Economic Analysis (3)
- 621 Urban Systems and Analysis (3)
- 632 Field Study of Population (3)

#### AREA COURSES

- 340 Geography of the United States and Canada (3)
- 345 Geography of the Soviet Union (3)
- 350 Geography of Asia (3)
- 352 Geography of Japan (3)
- 353 Geography of China (3)
- 355 Geography of South Asia (3)
- 356 Geography of Southeast Asia (3)
- 361 Australia and New Zealand (3)
- 365 Geography of the Pacific (3)
- 368 Geography of Hawaii (3)
- 650 Seminar in Geography of Asia (3)
  - (1) Asia
  - (2) China
  - (3) Japan
  - (4) Southeast Asia
  - (5) South Asia
- 665 Seminar in Geography of the Pacific (3)



## TECHNIQUES AND METHODOLOGY

- 370 Airphoto and Image Interpretation (2)  
 375 Cartography (3)  
 380 Quantitative Methods in Geography (3)  
 680 Advanced Quantitative Methods in Geography (3)  
 685 Computer Applications in Geography (3)

## READING, RESEARCH, GENERAL

- 691 History of Geographic Thought (3)  
 695 Pro-seminar I—Models in Geography (3)  
 696 Pro-seminar II—Research Design (2)  
 700 Seminar in Geography (3)  
 750 Research Seminar (3)  
     (1) applied urban climatology   (6) economic geography  
     (2) biogeography               (7) urban geography  
     (3) medical geography       (8) geographic aspects of  
   economic development  
     (4) resource management   (9) cultural geography  
     (5) population geography   (10) conservation
- 791 Field Camp (1)  
 799 Directed Research (v.)  
 800 Thesis Research (v.)

## Geology and Geophysics

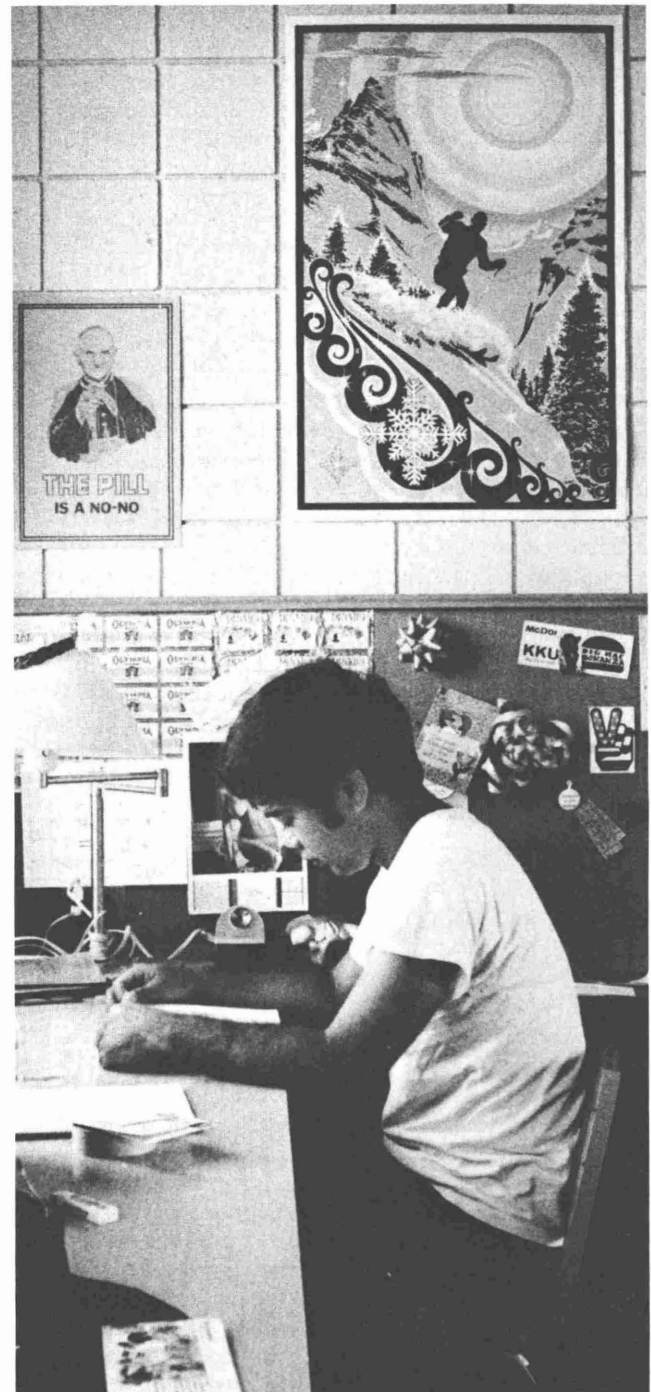
## Graduate Faculty

- S.H. Laurila, Ph.D. (Department Chairman and Sub-chairman for Geodesy)—geodesy  
 R.M. Moberly, Jr., Ph.D. (Sub-chairman for Geology)—sedimentology, marine geology  
 F.L. Peterson, Ph.D. (Sub-chairman for Hydrology)—hydrogeology  
 G.H. Sutton, Ph.D. (Sub-chairman for Solid Earth Geophysics)—seismology, exploration geophysics  
 A.T. Abbott, Ph.D.—ore deposits, geomorphology  
 W.M. Adams, Ph.D.—seismology, applied geophysics  
 D.C. Cox, Ph.D.—hydrology, groundwater and engineering geology  
 K.I. Daugherty, M.S.—physical geodesy  
 P.F. Fan, Ph.D.—geochemistry and mineralogy of marine sediments, geology of Asia  
 A.S. Furumoto, Ph.D.—seismology, geophysics  
 R.H. Johnson, Ph.D.—geophysics  
 M.A. Khan, Ph.D.—satellite geodesy, gravity, geophysics  
 G.A. Macdonald, Ph.D.—volcanology, igneous petrology  
 A. Malahoff, Ph.D.—geomagnetism, gravity  
 M.H. Manghnani, Ph.D.—geochemistry, geophysics  
 G.B. Morris, Ph.D.—seismology, geophysics  
 J.J. Naughton, Ph.D.—geochemistry  
 K.A. Pankiwskyj, Ph.D.—metamorphic geology, silicate phase petrology  
 J.M. Resig, Dr. rer. nat.—micropaleontology  
 J.C. Rose, Ph.D.—gravity, marine geophysics  
 H.H. Veeh, Ph.D.—marine geology; geochemistry  
 G.P. Woollard, Ph.D.—gravity, seismology, geomagnetism

## Affiliate Faculty

- D.A. Davis, M.S.—ground-water geology, geology of Pacific Islands  
 J.C. Larsen, Ph.D.—physical oceanography  
 H.G. Loomis, Ph.D.—applied mathematics  
 H.A. Powers, Ph.D.—volcanology, petrology

For Cooperative Faculty, see under Hawaii Institute of Geophysics or Water Resources Research Center in the General Catalog.



### Degree Requirements

**M.S.** The faculty will determine the suitability of Plan A or B at the preliminary conference. For Plan A a minimum of 24 credit hours of course work and 6 hours of thesis research, as well as general and thesis examinations, are required. For Plan B 30 credit hours of course work and final examination are required.

**Ph.D.** A candidate must pass a comprehensive examination which can be either oral or oral and written, depending on the particular subfield and a final examination in defense of his dissertation. A reading comprehension of one foreign language with useful scientific literature in the field of the candidate is required.

### Geodesy

Intended candidates should have a B.S. or B.A. degree with a major in one of the following fields: mathematics, physics, geodesy, geology, geophysics or civil engineering. Prior to entering the graduate program, the student should be familiar with the principles of surveying and photogrammetry. Deficiencies in undergraduate preparation must be made up. As a minimum requirement the student should be knowledgeable in general physics and mathematics through calculus. Graduate courses in photogrammetry are available at the University of Washington, Seattle, under a cooperative program.

### Geology

Intended candidates will be accepted from undergraduate majors in the natural sciences, mathematics, and engineering. Students not having year-length courses in elementary geology, physics, chemistry, college mathematics, and geological field methods, and at least one semester of mineralogy, petrology, and structural geology or their equivalent will be obliged to take those courses. The M.S. general examination and the Ph.D. comprehensive examination may include questions from all of the basic fields of geology, such as mineralogy, petrology, structural geology, stratigraphy, geomorphology, and paleontology.

### Hydrology

Training in hydrology involves not only several fields of the geosciences but several other disciplines. Intended candidates will usually be accepted from undergraduate majors in the natural sciences or engineering. Students not having adequate backgrounds in geosciences, mathematics, physics, chemistry, or hydraulics may be required to take certain undergraduate courses.

Degree programs may be arranged which emphasize various aspects of hydrology. Such programs will involve not only courses from the geosciences but courses in geography, oceanography, engineering, soils, agriculture, or other fields, depending on the aspects to be emphasized. The Hawaiian environment offers special opportunities for research in tropical hydrometeorology, tropical agrohydrology, and the geohydrology of oceanic islands and basalt terrains.

### Solid Earth Geophysics

Intended candidates will be accepted from undergraduate majors in physical sciences, mathematics and engineering. Deficiencies in undergraduate preparation in mathematics, physics, chemistry or geology must be made up. The background required depends upon each candidate's choice of specialization. Besides geosciences courses, courses in physics, engineering, oceanography and mathematics may be included in the candidate's program.

#### GEOLOGY AND GEOPHYSICS (GG)

- 799 Directed Research (v.)
- 800 Thesis Research (v.)

#### GEODESY (GG)

- 457 Introduction to Geodetic Science (3)
- 481 Potential Theory (4)
- 482 Elements of Space Science (3)
- 680 Seminar in Geodesy (v.)
- 681 Physical Geodesy (4)
- 683 Satellite Geodesy (3)
- 684 Advanced Geodesy (3)
- 685 Adjustment Computation (3)

#### GEOLOGY (GG)

- 301 Mineralogy (3)
- 302 Petrology (3)
- 303 Structural Geology (3)
- 305 Geological Field Methods (2)
- 316 Geomorphology (3)
- 411 Paleontology (3)
- 412 Micropaleontology (3)
- 415 Regional Geology (2)
- 424 Advanced Mineralogy (5)
- 425 Geochemistry (3)
- 426 Advanced Petrology (3)
- 430 Geology of Asia (2)
- 440 Economic Geology (2-2)
- 601 Seminar in Volcanology (2)
- 602 Seminar in Petrology (2)
- 607 Seminar in Ore Deposits (2)
- 609 Seminar in Geomorphology (2)
- 614 Advanced Field Study (v.)
- 619 Sedimentology (3)
- 620 Stratigraphy (3)
- 623 Marine Geology (3)
- 625 Seminar in Current Research Topics (v.)
- 672 Seminar in Geotectonics I (3)
- 673 Seminar in Geotectonics II (3)

#### HYDROLOGY (GG)

- 306 Work of Water (4)
- 454 Engineering Geology (3)
- 455 Ground-water Geology (4)
- 605 Seminar in Engineering and Ground-water Geology (3)

#### SOLID EARTH GEOPHYSICS (GG)

- 351 Seismology (3)
- 360 Principles of Geophysics (3)
- 463 Physical Properties of Earth Matter (3)
- 465-466 Geophysical Exploration (4-4)
- 655 Seismic Source Mechanisms (3)
- 656 Seismic Propagation Phenomena (3)
- 657 Analysis and Synthesis of Seismograms (3)
- 658 Seismometry and Seismological Model Study (3)
- 660 Seminar in Solid Earth Geophysics (v.)
- 661 Marine Geophysics (3)
- 662 Principles of Theoretical Geophysics (3)
- 665 Numerical Methods in Geophysical Data Analysis (3)
- 671 The Magnetic Field of the Earth (3)
- 674 Rock Magnetism and Paleomagnetism (3)
- 675 Seminar in Geomagnetism (v.)

**German***Graduate Faculty*

- R. Seymour, Ph.D. (Chairman)—Germanic linguistics  
 J. Crean, Ph.D.—methodology  
 D. Dauer, Ph.D.—18th-and 19th-century German literature and philosophy  
 A. Moore, M.A.—linguistics and stylistics  
 J. Sang, Ph.D.—19th-and 20th-century literature  
 W. Scherer, Ph.D.—Medieval, Reformation and Baroque literature

Plan A (thesis) and Plan B (nonthesis) are designed to meet the needs of two different types of students. Plan A is intended primarily for those desiring the experience of writing a thesis. Plan B is intended primarily for those desiring additional course work in linguistics and the methodology of language teaching.

**Admission.** In addition to the requirements of the Graduate Division, candidates should have majored in German as undergraduates. Applicants with less than a 3.0 average in their German major may be admitted provisionally. All must demonstrate, by means of a tape recording or by personal interview, an acceptable accent and a reasonable degree of fluency in German. Candidates should also present a minimum of 6 semester hours of related work (art, linguistics, history, philosophy, etc.)

**Degree Requirements.** A preliminary conference and general examination will be administered to determine the student's program and objectives. By September 30 the candidates must also take the M.L.A. Proficiency Examinations (speaking, reading, writing, and understanding) unless he presents satisfactory scores taken within the previous year.

Plan A (thesis) requires a minimum of 18 hours of course work (12 of which must be numbered 600-799, including at least one seminar and excluding the research methods course) and 6 credit hours of thesis research. Comprehensive examinations, thesis and final oral examination complete the degree. Plan B (nonthesis) requires a minimum of 18 credits in courses numbered 600-799 (including at least one seminar and excluding the research methods course) and no more than 12 hours selected from approved related courses. A final examination, together with a seminar appearance after presentation of a paper, completes the degree.

**GERMAN (Ger)**

- 409 Enlightenment-Strum und Drang (3)  
 410 Classicism (3)  
 411 Romanticism (3)  
 413-414 German Literature from 1880 to the Present (3-3)  
 415 Contemporary German Literary Activity (3)  
 428 Survey of German Lyric Poetry (3)  
 432 Stylistics (3)  
 451 Introduction to History of German Language (3)  
 452 Introduction to Middle High German (3)  
 609-610 Middle High German (3-3)

- 615 History of the German Language (3)  
 616 History of the German Language (3)  
 650 Seminar: The German Essay (3)  
 651 Seminar: The German Novelle (3)  
 652 Seminar: The German Drama (3)  
 653 Seminar: Lyric Poetry (3)  
 654 Seminar: The German Novel (3)  
 655 Faust I (3)  
 656 Faust II (3)  
 699 Directed Research (v.)  
 735 Seminar in German Literature (3)  
 800 Thesis Research (6)

**History***Graduate Faculty*

- H.F. Margulies, Ph.D. (Department Chairman)—United States political, the Progressive Era  
 G. Akita, Ph.D.—Far East, modern Japan  
 E.D. Beechert, Ph.D.—United States economic  
 J.J. Connors, Ph.D.—European intellectual  
 C.B. Cowing, Ph.D.—United States social and economic  
 R.E. Cubberly, Ph.D.—early modern Europe, France  
 A.G. Daws, Ph.D.—Hawaii, the Pacific  
 W.A. Ernest, Ph.D.—medieval Europe  
 D. Johnson, Ph.D.—United States diplomatic, Latin America, United States in the Pacific  
 W. Johnson, Ph.D.—recent United States  
 H.H.W. Kang, Ph.D.—Far East, Korea  
 D.W.Y. Kwok, Ph.D.—modern China, Chinese thought  
 H.J. Lamley, Ph.D.—modern China  
 W.H. Maurer, Ph.D.—ancient Near East, Greece and Rome  
 J.M. McCutcheon, Ph.D.—United States cultural and social  
 B.E. McKnight, Ph.D.—Sung China  
 H.B. Melendy, Ph.D.—Asian immigration, education  
 J.C. Miller, Ph.D.—colonial America, American Revolution  
 V.D. Morris, Ph.D.—pre-modern Japan  
 I.A. Newby, Ph.D.—19th century United States, Negro  
 G.R. Nunn, Ph.D.—Asia, research methods and resources  
 R.L. Rapson, Ph.D.—United States intellectual and cultural  
 R.K. Sakai, Ph.D.—Far East, modern Japan  
 S. Sakamaki, Ph.D.—Japan, the Ryukyus  
 A.W. Saville, Ph.D.—modern Europe, Germany  
 J. Sharma, Ph.D.—South Asia  
 M. Shinoda, Ph.D.—Far East, pre-modern Japan  
 M.P. Speidel, Ph.D.—ancient Europe, Roman Empire  
 J. Stalker, Ph.D.—recent United States social and economic  
 B. Stein, Ph.D.—India  
 J.J. Stephan, Ph.D.—modern Japan, Japanese foreign policy  
 S. Uhalley, Ph.D.—modern China, Chinese Communism  
 R. Van Niel, Ph.D.—Southeast Asia, Indonesia  
 W.F. Vella, Ph.D.—Southeast Asia, Thailand  
 R.A. Wade, Ph.D.—Russian intellectual  
 J.A. White, Ph.D.—Russia, Russia in Asia

Intended candidates must present a minimum undergraduate preparation of 18 upper-division credits in history. Students who lack this preparation or who wish to undertake study in a new area of history must make up deficiencies either before or during graduate study. History also requires GRE aptitude, qualitative and quantitative, scores for admission to the M.A. and Ph.D. programs.

Intended candidates for the M.A. degree may select either the Plan A (thesis) or the Plan B (nonthesis) program. Plan A requires a minimum of 24 semester

hours of graduate course work (at least 15 must be in courses numbered 600 to 799, including History 602), 6 semester hours of thesis research and a final oral examination. Plan B requires a minimum of 30 hours of graduate course work (at least 18 in courses numbered 600 to 799, including History 602), comprehensive examinations in two fields of history and a final oral examination, covering a research paper originating in a graduate course and the two fields of history offered in the comprehensive examinations. Under both plans an intended candidate is required to give evidence of his competence in a foreign language appropriate to the area of his major interest. In some fields language competence is demonstrated by passing an examination in the language; in other fields, by completing or having completed 12 hours of college-level language study.

Intended candidates for the Ph.D. degree are expected to possess the M.A. degree in history or its equivalent. The Ph.D. candidate must demonstrate that he is capable of pursuing a successful career as a professional historian by showing initiative in historical research and by giving evidence of ability to present his findings both orally and in writing. He must prove his competence by acquiring a broad background in general history, passing four comprehensive examinations that show special academic knowledge in two broad geographic areas of history, and completing an original dissertation and a final oral examination. He must also demonstrate a knowledge of at least two foreign languages related to the dissertation topic; for candidates in United States or Pacific history an alternative requirement may, at the discretion of the doctoral committee, be substituted for one of the languages.

The department of history offers the Ph.D. in the Asian, American, Pacific and European fields. A student who plans to base his dissertation primarily on locally available resources should bear in mind that, although American and European resource materials for some topics are available, the University's particular resource strengths are in the areas of the Pacific and Asia.

An applicant for admission to the M.A. program is requested to supplement his application and transcript with at least two letters of recommendation from professors with whom he has worked, and the aptitude test scores from the Graduate Record Examination (GRE).

An applicant for admission to the Ph.D. program is requested to supplement his application and transcript with (1) at least three letters of recommendation from professors with whom he has worked, (2) a sample of his research work, such as a seminar paper or master's thesis and (3) the aptitude test scores from the Graduate Record Examination (GRE).

Additional details on the graduate programs in history are given in a departmental brochure, which is available upon request.

Courses for the graduate programs are to be selected from those listed below and from graduate offerings in related disciplines as directed by the candidate's supervisory committee.

The consent of the instructor is required for admission to all courses numbered 600 through 800, except History 602. Courses available for the graduate program are listed below.

## HISTORY (Hist)

## Asia

- |         |   |
|---------|---|
| 401-402 | History of South Asia   |
| 405-406 | History of Southeast Asia   |
| 407     | National and Regional History in Southeast Asia<br>(1) Southeast Asia to 1300 A.D.<br>(2) Southeast Asia 1300 to circa 1750<br>(3) Modern Philippines<br>(4) Modern Malaysia<br>(5) Modern Indonesia<br>(6) Modern Vietnam, Laos, and Cambodia<br>(7) Modern Thailand<br>(8) Modern Burma |
| 409-410 | History of China  |
| 411-412 | Local History of China  |
| 413-414 | History of Japan  |
| 415-416 | Imperial and Feudal Institutions of Traditional Japan   |
| 417-418 | History of Korea  |
| 497     | Senior Tutorial in History (Section on Japan)   |
| 654     | Seminar in Mainland Southeast Asian History   |
| 655     | Seminar in Island Southeast Asian History   |
| 661     | Seminar in Chinese History  |
| 663     | Seminar in Indian History<br>(1) Ancient India<br>(2) South India<br>(3) Muslim India<br>(4) Modern South Asia  |
| 665     | Seminar in Japanese History<br>(1) Traditional<br>(2) Early Modern<br>(3) Modern  |
| 667     | Seminar in Korean History   |
| 701     | Research Materials and Methods in Asian History   |
| 709-710 | Institutional History of Korea  |
| 711     | Korean Historical Literature  |
| 713-714 | Chinese Historical Literature   |
| 717-718 | Chinese Intellectual History  |
| 721-722 | China from Classical Antiquity to 750   |
| 723-724 | China from 750 to 1700  |
| 725-726 | Contemporary China Seminar  |
| 727-728 | Japanese Historical Materials and Sources   |
| 730     | Japan: The Bakumatsu Period (1830-1873)   |
| 731     | Seminar in Political History of Modern Japan  |
| 733-734 | Japanese Intellectual History   |
| 735-736 | Seminar on Pre-Modern Japan c. 850-1800   |

## The Pacific

- |     |                                  |
|-----|----------------------------------|
| 421 | Australia and New Zealand        |
| 422 | History of Oceania               |
| 424 | History of the Hawaiian Islands  |
| 425 | The United States in the Pacific |
| 675 | Seminar in Pacific History       |

## Americas

- |         |   |
|---------|---|
| 461     | Colonial America to 1790                              |
| 462     | The Young Republic: U.S. History 1789-1841            |
| 463     | Crisis of the Union: U.S. History 1841-1877           |
| 464     | The Transformation of America: U.S. History 1877-1920 |
| 465     | Troubled Peace: U.S. History 1920-1941                |
| 466     | America and World Leadership: The U.S. Since 1941     |
| 471-472 | Diplomatic History of the United States               |
| 475     | Constitutional History of the United States           |
| 477-478 | Economic History of the United States                 |
| 480     | History of Black Americans                            |
| 481-482 | American Thought and Culture                          |
| 483     | The West in American History                          |
| 484     | The South in American History                         |

- 485 The City in American History  
 486 Representative Americans  
 487-488 History of Latin America  
 631 Advanced Problems and Reading in American History  
 635 The Colonial Period in American History  
 636 Seminar in Nineteenth-Century American History  
 637 The Progressive Period in American History  
 638 Seminar in Recent American History  
 640 Seminar in American Social and Intellectual History  
 641 Seminar in American Diplomatic History

#### Europe

- 419 European Expansion  
 426 The Ancient Near East  
 427 Ancient Greek History  
 428-429 Roman Civilizations  
 431-432 Medieval Europe, 300-1300  
 435 Renaissance and Reformation, 1300-1600  
 437 Early Modern Europe, 1600-1800  
 438 French Revolution, 1789-1815  
 439 Europe in the Nineteenth Century  
 440 Europe since Versailles  
 441-442 East Central Europe  
 443-444 History of Germany  
 445-446 History of France  
 447-448 History of England  
 449-450 History of Russia

- 451-452 Modern Russian and Soviet Foreign Policy  
 453-454 Intellectual History of Russia and the Soviet Union  
 455-456 European Intellectual History  
 459 Constitutional History of England  
 473-74 History of Spain and Portugal  
 611 Seminar in European History  
     (1) Ancient  
     (2) Medieval  
     (3) Early Modern  
     (4) Modern  
     (5) England  
 618 British Empire and Commonwealth  
 619 Seminar in Russian History  
 620 Seminar in Russian Foreign Policy

#### Historiography, Historical Method, and Directed Research

- 602 Seminar in Historiography  
 799 Directed Research  
 800 Thesis Research

## Horticulture

### Graduate Faculty

- H. Kamemoto, Ph.D. (Chairman)—cytogenetics and breeding of ornamentals  
 J.L. Brewbaker, Ph.D.—genetics, corn breeding, radiobiology  
 R.A. Criley, Ph.D.—floriculture, ornamentals  
 E.T. Fukunaga, M.S.—tropical fruits  
 J.C. Gilbert, Ph.D.—vegetable breeding  
 R.A. Hamilton, Ph.D.—tropical fruit improvement  
 R.W. Hartmann, Ph.D.—plant breeding and genetics  
 P.J. Ito, Ph.D.—tropical fruit breeding  
 C.L. Murdoch, Ph.D.—turf management  
 H.Y. Nakasone, Ph.D.—tropical fruit breeding  
 R.K. Nishimoto, Ph.D.—weed control, vegetable physiology  
 P.E. Parvin, Ph.D.—ornamentals  
 F.D. Rauch, Ph.D.—ornamentals  
 Y. Sagawa, Ph.D.—developmental morphology and cytogenetics  
 R.M. Warner, Ph.D.—tropical fruit ecology  
 D.P. Watson, Ph.D.—ornamentals

### Affiliate Faculty

- D.J. Heinz, Ph.D.—sugar cane cytogenetics  
 B.J. Krauss, M.S.—plant physiology and morphology  
 L.G. Nickell, Ph.D.—plant physiology

Intended candidates for the M.S. or Ph.D. in horticulture must present a minimum of 24 hours of undergraduate credit in plant sciences (including botany, horticulture, agronomy, plant pathology) and related fields. Basic courses in chemistry and botany are required. The Graduate Record Examination is required for admission.

All M.S. candidates are required to pass a two-hour written general examination administered by the graduate faculty in horticulture during their first semester in residence. A final oral examination is also required. For Plan A a minimum of 24 credits of course work and 6 credits for thesis preparation are required.

All Ph.D. candidates are required to pass a three-hour written qualifying examination administered by the graduate faculty in horticulture during their first year in residence. Candidates must demonstrate proficiency by examination in either French, German, Spanish, Russian, or Japanese.



Courses available for the graduate program are listed below. Related fields in which credit will normally be allowed toward the degrees in horticulture include agronomy, biochemistry, biophysics, botany, entomology, food science, genetics, microbiology, plant pathology, soil science, and zoology. Required courses are marked with an asterisk.

#### HORTICULTURE (Hort)

- 450 Tropical Horticultural Crop Production (4)
- 453 Plant Breeding (3)
- 460 Turfgrass Management (3)
- 471 Post-Harvest Handling (3)
- 481 Weed Science (3)
- 603 Experimental Design (3)
- 611 Plant Improvement Systems (3)
- 615 Advanced Plant Breeding (3)
- 618 Plant Cytogenetics (3)
- 650 Advanced Vegetable Crops (3)
- 662 Advanced Tropical Fruit Science (3)
- 664 Orchidology (3)
- 666 Radiation Biology (3)
- \*667 Horticulture Seminar (1)
- 668 Growth Regulators in Horticulture (2)
- 669 Laboratory in Plant Growth Regulators (1)
- 691 Crop Ecology (3)
- 699 Directed Research (v.)
- 711 Special Topics in Experimental Horticulture (v.)
- 800 Thesis Research (v.)

### Information and Computer Sciences

#### Graduate Faculty

- R.H. Jones, Ph.D. (Chairman)—time series analysis; statistics
- N. Abramson, Ph.D.—information theory and coding; computer nets
- L. Freeman, Ph.D.—information processing in the social sciences
- N.T. Gaarder, Ph.D.—communication theory
- W. Gersch, Ph.D.—time series analysis; bio-medical engineering
- B. Kinariwala, Ph.D.—system theory; computing algorithms
- F.F. Kuo, Ph.D.—computer aided design; computer graphics
- M. Lester, Ph.D.—syntactic theory and natural language models
- A. Lew, Ph.D.—software; computation; system theory
- S. Lin, Ph.D.—error correcting codes
- D. Pager, Ph.D.—recursive function theory; automata theory; artificial intelligence
- W.W. Peterson, Ph.D.—coding theory; machine languages
- F.R. Pitts, Ph.D.—computer applications in the social sciences
- B. Plasch, Ph.D.—decision theory; mathematical programming; system analysis and design
- T. Rodgers, Ph.D.—psycholinguistics; computer-aided instruction
- D. Slepian, Ph.D.—communication theory; applied mathematics
- R. Sprague, Ph.D.—data management systems; management information systems
- L. Wallen, Ph.D.—mathematics of communication
- S. Watanabe, Ph.D.—pattern recognition
- E.J. Weldon, Jr., Ph.D.—data communications; logic design; error correcting codes

The information and computer sciences M.S. program is intended to serve both the student who is interested in a career in information and computer sciences and the student who expects to use information and computer sciences in another profession. Prospective students must present a baccalaureate degree, and although students from all fields will be accepted, students whose undergraduate field of study was not busi-

ness, engineering, mathematics, or science should consult with the program chairman before applying for admission. The Graduate Record Examination Aptitude Test is required for all U.S. applicants and recommended for foreign applicants. The minimum requirements for admission to the program follow:

1. A working knowledge of some general programming language such as FORTRAN, PL/I, or COBOL.
2. A year course in calculus, or a semester course in probability theory, or a semester course in logic.

Plan A and Plan B are both available. Besides the general requirements of the Graduate Division for the master's degree, the student's program for either plan must conform to the following:

1. At least five background courses listed below must be included in the M.S. program. Of the five, at least one must be taken from each of the three areas.
2. The remainder of the program shall ordinarily consist of other background courses or credits from the list of elective courses. The student's program committee may approve other courses which fit in with the student's educational objectives.
3. All students must register for ISc 697, Seminar in Information and Computer Sciences, as an extra credit to be graded on a pass-fail basis.

### Background Courses

#### INFORMATION PROCESSING MACHINES—AREA 1

- EE 461 Digital Systems and Computer Design (3)
- ISc 466 Computer Organization & Programming Techniques (4)
- ISc 467 Algorithmic Languages (4)
- ISc 621 Formal Linguistics (3)
- ISc 622 The Theory and Construction of Compilers (3)
- ISc 627 Information Structures (3)
- ISc 665 Systems Programming (3)

#### LOGICAL ANALYSIS—AREA 2

- Math 412 Introduction to Abstract Algebra (3)
- Phil 445 Symbolic Logic I (3)
- EE 460 Digital Circuits (3)
- ISc 625 or Ling 625 Mathematical Properties of Natural Languages (3)
- ISc 630 Information Processing in the Nervous System (3)
- ISc 644 Pattern Recognition (3)
- ISc 661 The Theory of Automata (3)
- ISc 663 The Theory of Computability (3)
- ISc 671 Artificial Intelligence (3)

#### PROBABILISTIC ANALYSIS—AREA 3

- ISc 371, Math 371 or 471, Probability (3)
- ISc 443, Math 373 or 472, Statistics (3)
- ISc 445 Introduction to Random Processes (3)
- ISc or EE 446 Information Theory and Coding (3)
- ISc 641 Discrete State Stochastic Processes (3)
- ISc 646 Parametric Methods in Time Series Analysis (3)
- ISc 648 Theory of Inference (3)
- ISc 650 Time Series Analysis (3)
- ISc 655 Applied Regression Analysis (3)
- ISc 698 Seminar in Time Series Analysis and Applications (1)

An up-to-date list of elective courses can be obtained from the department secretary. This list includes courses from a wide variety of application areas.



## Library Studies

### Faculty (General)

R.D. Stevens, Ph.D. (Dean)—government documents  
 I.W. Harris, Ph.D. (Assistant Dean)—reader services  
 J.B. Abrera, Ph.D.—cataloging, management  
 C.M. Adams, M.A.—social functions  
 M.W. Ayrault, M.S. in L.S.—cataloging  
 R.W. DeAngelo, M.S. in L.S.—children's literature  
 A.J. Fristoe, M.L.S.—administration  
 J.H. Haas, M.L.S.—reader services, documentation  
 J.R. Hunt, M.A. in L.S.—administration  
 A. Kamida, M.L.S.—cataloging  
 R. Kane, M.L.S.—science and technology  
 D.C. McAlister, M.Ed., B.S. in L.S.—cataloging  
 G.R. Nunn, Ph.D.—Asian reference and administration  
 S. Saito, M.L.S.—reference and bibliography  
 E.T. Schofield, Ed.D.—audio-visual, school and public services  
 Y. Suzuki, M.L.S.—administration, Far Eastern collections, building library collections  
 M.G. Taylor, M.L.S.—reference and bibliography  
 M.J. Tsui, M.L.S.—reference and bibliography  
 S. Vann, Ph.D.—social functions, international librarianship, indexing  
 S.L. West, J.D.—social functions  
 J. Wheelwright, M.S. in L.S.—business and economics

The program leading to the degree of master of library studies consists of a core curriculum to provide the basic professional equipment for all types of library work and enough electives to enable each student to explore one area of specialization.

**College, Public, and Special Libraries:** The normal basic curriculum for public, college, and special librarians includes the following courses:

### LIBRARY STUDIES CORE CURRICULUM (LS)

- 601 Bibliography and Reference Sources (3)
- 605 Basic Cataloging and Classification (3)
- 610 Social Functions of Libraries (3)
- 678 Reader Services (3)
- 615 Building Library Collections (3)
- 647 Management of Library Operations (3)
- or
- 650 Administration of Libraries (3)

### ELECTIVES

- 602 Advanced Reference Sources (3)
- 606 Advanced Cataloging and Classification (3)
- 618 Government Documents (3)
- 642 Audio-Visual Services in Libraries (3)
- 660 Science and Technology (3)
- 662 Business and Economic Literature (3)
- 664 Abstracting and Indexing for Information Services (3)
- 665 Special Libraries (3)
- 670 Literature Searching and Documentation (3)
- 681 Reading Materials for Children (3)
- 682 Reading Materials for Youth (3)
- 683 Service for Children and Young People (3)
- 684 School Library-Media Center Problems (3)
- 685 Traditional Literature and Oral Narration (3)
- 693 Special Topics in Librarianship (3)
- 696 Field Seminar (during last term in the School) (3)
- 701 Administration of Libraries in Asia (3)
- 705 Asian Reference Sources (3)
- 706 Technical Services for Far Eastern Collections (3)
- 715 Seminar in Library Development (3)
- 716 International Publishing and Bibliography (3)

**School Librarians:** The basic program for school library work is identical with the above—electives for school librarians are normally selected from the following courses:

- 642 Audio-Visual Services (3)
- 681 Reading Materials for Children (3)
- 682 Reading Materials for Youth (3)
- 683 Service for Children and Young People (3)
- 684 School Library-Media Center Problems (3)
- 685 Traditional Literature and Oral Narration (3)

For those who have not had practice teaching, the following course may be required:

- 696 Field Seminar (during last term in the School of Library Studies) (3)

School librarians who wish to qualify for work in other states will require 36 hours of library school study, and an additional 12 credit hours is frequently designated in fields of education in certain states. Supervised practice work in school library, arranged by a faculty member of the School of Library Studies, is also required for certification in some states; and students who want to make sure that their degree will qualify them for certification in other states should make enquiries in advance through the dean's office.

## Linguistics

### Graduate Faculty

- B.W. Bender, Ph.D. (Chairman)—phonology; general linguistics; Micronesian languages
- S.H. Elbert, Ph.D.—comparative and descriptive linguistics; Hawaiian, other Polynesian and Micronesian languages; folklore
- G.H. Fairbanks, Ph.D.—descriptive and comparative linguistics; Indo-European, especially Indo-Aryan, Slavic and Germanic
- M.L. Forman, Ph.D.—general linguistics, linguistic anthropology, creoles and sociolinguistics, Philippine studies
- G.W. Grace, Ph.D.—historical linguistics; Austronesian, especially Melanesian linguistics; ethnolinguistics
- R.W. Hsu, Ph.D.—computer techniques, programming languages; Micronesian languages
- L.S. Josephs, Ph.D.—descriptive and theoretical linguistics; Japanese and Korean
- F.-K. Li, Ph.D.—Chinese and Tai linguistics; other Sino-Tibetan languages; North American Indian linguistics
- A.V. Lyovin, Ph.D.—generative phonology; Chinese dialectology; Sino-Tibetan
- H.P. McKaughan, Ph.D.—descriptive and theoretical linguistics; Philippine and Papuan languages
- T.H. Roberts, Ph.D.—descriptive linguistics, stratificational grammar, Chinese
- A.J. Schütz, Ph.D.—descriptive linguistics, field methods, lexicography; Fijian and other Melanesian languages; history of linguistics in the Pacific
- S. Starosta, Ph.D.—theoretical linguistics; Asian and Pacific languages
- L.C. Thompson, Ph.D.—descriptive and comparative linguistics, field methods; North American Indian linguistics; Southeast Asian linguistics
- D.M. Topping, Ph.D.—descriptive and applied linguistics; Philippine and Micronesian languages
- S.M. Tsuzaki, Ph.D.—descriptive and applied linguistics; languages in contact; Romance linguistics

*Cooperating Faculty*

- M. Higa, Ed.D. (Sub-chairman for Psycholinguistics)  
—psycholinguistics  
L.A. Jakobovits, Ph.D.—psycholinguistics  
R.C. Johnson, Ph.D.—social and developmental psychology  
K.A. Minke, Ph.D.—psychology; language learning measurement  
T.S. Rodgers, Ph.D.—psycholinguistics  
A.W. Staats, Ph.D.—psychology; language learning and language  
function  
D. Steinberg, Ph.D.—psycholinguistics

*Affiliate Faculty*

- A.M. Niyekawa-Howard, Ph.D.—psycholinguistics

The faculty represents a variety of theoretical viewpoints. The various faculty members are especially well qualified to direct research on languages of the Pacific and parts of Asia and the Americas. Fields of special competence include descriptive and comparative linguistics, general linguistic theory, language contact and variation, ethnolinguistics, and psycholinguistics.

**Departmental Requirements**

Students admitted to graduate programs in linguistics normally have a background in at least one foreign language. Some background in mathematics or one of the sciences is also useful. Students having no previous work in linguistics proper are required to take 320, General Linguistics.

Both the M.A. and Ph.D. degrees are offered. Students interested in the Ph.D. who do not already hold an M.A. in linguistics should apply initially for admission to the M.A. program. (The only exceptions are those already holding an M.A. in educational psychology, ESL, psychology, or a related discipline who are applying for admission to the Ph.D. program with major concentration in psycholinguistics.) A core of courses (410, 421, 422, 621, 622, 630, 645 or their equivalents) is required of all advanced degree candidates. All students are also required to take at least one advanced seminar.

**M.A.**

The department offers Plan A, Plan B and Plan C programs. In addition to the University-wide residence requirement of a minimum of two semesters of full-time work, all three programs require that the student demonstrate competence in one language other than his native language. A general examination is given late in the first semester of graduate study to assess potential and diagnose strengths and weaknesses.

Plan A requires a thesis (12 units) and a minimum of 18 units of course work. However, all candidates must have taken at least one advanced seminar and must have completed the core of courses outlined above. A final oral examination, covering the thesis and related areas, is also required.

Plan B requires a minimum of 30 units approved by the student's adviser. It also requires a final written examination near the end of the course work.

Plan C is open to select students who have had some previous work in linguistics and who show both high

potential for a scholarly development and the motivation and discipline necessary for a more flexible and independent course of study. Students interested in Plan C enroll initially under either Plan A or Plan B; selection for Plan C is made after the general examination, and students selected embark on the more flexible program it makes possible with their second semester of work.

This program will be developed in consultation with the student's program committee, a committee of three, the chairman of which will serve as the student's chief adviser. Usually, in the interest of continuity, the same committee will administer both the general examination and the oral portion of the final examination.

Plan C requires a final examination with both written and oral portions. The written portion coincides with the written final examination of Plan B. The oral portion permits the student's program committee, after reviewing his performance on the written portion, to investigate his grasp of both weak and strong areas in greater depth and detail.

**Ph.D.**

Ph.D. students must pass a qualifying examination, a comprehensive examination, and a final oral examination in defense of the dissertation. The qualifying examination is normally taken at a point soon after the completion of the core of courses. The final examination for the M.A. degree may also serve as the qualifying examination for the Ph.D.

The student must also demonstrate competence in two languages other than his native language. One of the languages must be English, French, German or Russian. Students are admitted to candidacy after demonstrating competence in both languages and performing successfully on the comprehensive examination.

The comprehensive examination in linguistics is both written and oral. In addition to a comprehensive knowledge of the field of linguistics, all students except those majoring in psycholinguistics (see below) are expected to demonstrate strength in phonology, grammar, historical linguistics, and two additional areas of specialization chosen from among the following: phonetics, semantics, psycholinguistics, sociolinguistics, ethnolinguistics, language learning and teaching, or the linguistics of any of the following area or genetic groupings: Indo-European, Tai, Austroasiatic, Chinese, Japanese, Philippine, Indonesian, Micronesian, Melanesian, Polynesian, Austronesian, or American Indian linguistics.

The foregoing is intended as a general guide to the coverage intended for the comprehensive examination; in practice every attempt is made to tailor programs to the individual student's background and interests—in some cases giving one of the optional areas greater emphasis, the other lesser. Integration of the required areas with one or more of the latter areal or genetic specializations is encouraged. Also, other areas of specialization (including ones which are outside the discipline and which will be examined by the committee member from outside the department) may be included where such seem called for by the student's total program and where adequate faculty supervision is avail-

able. Shortly after passing the qualifying examination, the student is expected to declare the optional areas he hopes to develop strength in. This information helps determine the composition of his program committee; details and relative emphases of the total program are then worked out in consultation with the committee.

### Psycholinguistics

In addition to the minor specialization in psycholinguistics referred to above, a major concentration in psycholinguistics is also available as an option under the Ph.D. in linguistics program. Highly qualified holders of the M.A. in educational psychology, English as a second language, linguistics, psychology, or other related disciplines may be admitted to the program. Concentrations are available in theoretical, developmental, social, and educational psycholinguistics. Required courses beyond those in the linguistics core listed above include Ed EP 429, 608, 629; ESL 650, 660, 670; Psy 401, 655; and at least one seminar in the student's area of concentration within psycholinguistics. (Students admitted to this Ph.D. program with major concentration in psycholinguistics who hold the M.A. in some discipline other than linguistics may be exempted from the 630 and 645 linguistics core requirements, and all students in the program are exempted from the requirement of demonstrating special strength in historical linguistics on the comprehensive examination; phonology, grammar, and psycholinguistics are the areas emphasized on the comprehensive examination in this program.) Suggested elective courses for students majoring in psycholinguistics include Anth 418; Ed EP 708; ESL 625, 640, 720; Ling 440, 625, 635, 650-651, 780; Phil 417, 604, 605; Psy 320, 322, 423, 430, 431, 643, 654, 665, 730; Sp 613; Soc 449, 741.

### Courses

The courses (listed below) are offered to guide the student in his preparation for the various examinations, although he must expect to do individual study in areas not covered by course offerings. Generally, the courses numbered below 700 are designated to provide the student with a thorough introduction to traditional descriptive, comparative, and transformational-generative approaches.

Those bearing numbers in the 700's are seminars, and a number of the seminars with repeatable course numbers—750, 760, and 770—may be offered in a typical semester, depending on the interests of the resident faculty and students. In any given semester there are normally a number of seminars dealing with geographical areas, particular language families, the structures of individual languages, and particular theoretical problems. A major portion of the work done beyond the M.A. level will be in seminars and in directed research.

#### LINGUISTICS (Ling)

- 320 General Linguistics (3)
- 410 Articulatory Phonetics (3)
- 421 Introduction to Phonological Analysis (3)
- 422 Introduction to Grammatical Analysis (3)

- 440 Introduction to Linguistic Semantics (3)
- 611 Acoustic Phonetics (3)
- 615 The Nature of Language (3)
- 621 Phonology (3)
- 622 Grammar (3)
- 625 Mathematical Properties of Natural Languages (3)
- 630 Field Methods (3)
- 635 Language Variation (3)
- 645 Introduction to Comparative Method (3)
- 650-651 Advanced Linguistic Analysis (3-3)
- 660 Historical Linguistics (3)
- 699 Directed Research (v.)
- 750 Seminar (3)
- 760 Problems in Comparison and Pre-History (3)
- 770 Areal Linguistics (3)
- 780 Ethno-Linguistics (3)
- 800 Thesis or Dissertation Research (v.)

### Mathematics

#### Graduate Faculty

- H.S. Bear, Ph.D. (Chairman)—functional analysis
- E. Bertram, Ph.D.—group theory and combinatorics
- C. Brase, Ph.D.—ring theory
- R. Colby, Ph.D.—ring theory
- G. Csordas, Ph.D.—complex function theory
- S. Fakhruddin, Ph.D.—ring theory
- F. Gilfeather, Ph.D.—functional analysis
- C. Gregory, Ph.D.—applied mathematics
- W. Hanf, Ph.D.—mathematical logic
- H. Hilden, Ph.D.—complex function theory
- R. Hirschfeld, Ph.D.—analysis
- F. Iha, Ph.D.—differential equations
- J. Johnson, Ph.D.—universal algebra
- D. Kibler, Ph.D.—algebraic geometry
- S. Kranzler, Ph.D.—differential equations
- M. Lee, Ph.D.—functional analysis
- A. Mader, Ph.D.—group theory
- T. McDermott, Ph.D.—functional analysis
- E. Mookini, Ph.D.—analysis
- N. Nobusawa, Ph.D.—algebra
- R. Pierce, Ph.D.—algebra
- T. Pitcher, Ph.D.—probability theory
- H. Reiter, Ph.D.—topology
- K. Rogers, Ph.D.—number theory
- A. Shukla, Ph.D.—logic
- E. Spielvogel, Ph.D.—applied mathematics
- L. Wallen, Ph.D.—functional analysis
- J. Williamson, Ph.D.—complex function theory
- R.Z. Yeh, Ph.D.—probability theory

Prospective graduate students must present a minimum preparation of differential and integral calculus, linear algebra, advanced calculus, and abstract algebra. Applicants must submit to the department scores for the aptitude and advanced (mathematics) tests of the Graduate Record Examination. The department requires the general examination of all incoming graduate students both for the master's and Ph.D. programs. Candidates for the M.A. degree (Plan A or B) must pass a written master's examination as part of the degree requirements. This examination covers abstract algebra, complex and real analysis. For the Ph.D. degree the department requires a reading knowledge of two foreign languages chosen from French, German and Russian.

The department of mathematics is offering the ex-

perimental Plan C for the M.A. degree. Students interested in this plan must demonstrate above average ability in the general examination, and are admitted to Plan C upon recommendation by the graduate chairman or his representative. The written part of the master's examination for Plan C is identical with the examination taken by students in Plans A and B. In addition the student will be examined orally.

Courses available for the graduate program are listed below. Courses may also be allowed in appropriate related fields.

#### MATHEMATICS (Math)

402	Partial Differential Equations (3)
403-404	Methods of Higher Analysis (3-3)
413	Abstract Algebra (3)
420	Introduction to the Theory of Numbers (3)
441	Numerical Analysis (3)
442	Vector Analysis (3)
444	Theory of Functions of a Complex Variable (3)
449	Topics in Undergraduate Mathematics (3)
455	Mathematical Logic I (3)
456	Mathematical Logic II (3)
471	Probability (3)
472	Statistical Inference (3)
611-612	Modern Algebra (3-3)
613-614	Group Theory (3-3)
615	Ring Theory (3)
617	Linear Algebra (3)
621-622	Topology (3-3)
631-632	Theory of Functions of a Real Variable (3-3)
633-634	Functional Analysis (3-3)
644-645	Analytic Function Theory (3-3)
649	Topics in Mathematics (3)
655	Set Theory (3)
671	Advanced Probability (3)
672	Stochastic Processes (3)
750	Seminar (v.)
799	Directed Reading and Research (v.)
800	Thesis Research (v.)

#### Mechanical Engineering

##### Graduate Faculty

J.C. Burgess, Ph.D.	—mechanics; acoustics
H.C. Chai, Ph.D.	—heat transfer, nuclear engineering
P. Cheng, Ph.D.	—radiation; fluid mechanics
J.C.S. Chou, Ph.D.	—environmental engineering; energy conversion
R.M. Fand, Ph.D.	—heat transfer; fluid mechanics
J.S. Fox, Ph.D.	—thermodynamics; gas dynamics
K.M. Htun, Ph.D.	—properties of materials; materials processing
G.L. Johnson, Ph.D.	—continuum mechanics; vibrations
D.A. Jones, Ph.D.	—materials science; corrosion
D.H. Kihara, Ph.D.	—thermodynamics; fluid mechanics
J. Larsen-Badse, Ph.D.	—materials science; corrosion
W. Stuiiver, Ph.D.	—mechanics; system dynamics

The department offers programs leading to the M.S. in mechanical engineering with areas of concentration in thermoscience (e.g., heat and mass transfer, thermodynamics, fluid mechanics, energy conversion, thermal

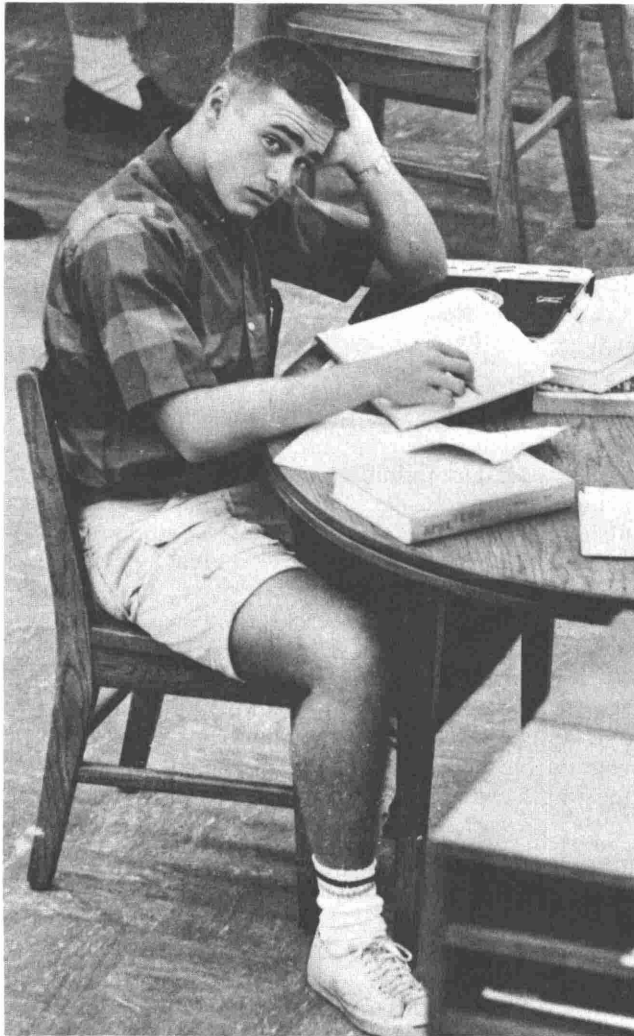
environmental engineering), in materials science (e.g., mechanical properties, corrosion, phase transformations, processing, marine materials) and in mechanics (e.g., dynamics, acoustics, continuum mechanics). Within these three areas of concentration students may opt for programs emphasizing either engineering science or engineering design; this option is reflected in the choice of both courses and thesis topic. Students are required to follow the Plan A (thesis) programs except that under special circumstances a petition to follow Plan B (non-thesis) may be granted by the graduate faculty.

Applicants for admission to study must present a B.S. degree or its equivalent in engineering or science. Before admission to candidacy the student must pass a general examination. This examination is given during the first semester. Applicants for graduate assistantships must submit the results of Aptitude and Advanced Engineering Tests of the Graduate Record Examination. A final examination is given to each candidate during his last semester of residence. For candidates enrolled under Plan A, the final examination consists of a seminar appearance; for those enrolled under Plan B, it consists of an oral examination. Prospective students may obtain additional information about the program by requesting a copy of the Mechanical Engineering Department Graduate Manual.

Mechanical engineering courses acceptable toward the M.S. degree are identified in the following list:

#### MECHANICAL ENGINEERING (ME)

422	Heat Transfer (3)
424	Introduction to Gas Dynamics (3)
431	Electronic Processes in Materials (3)
433	Failures in Materials
451	Automatic Control (3)
455	Nuclear Power Engineering (3)
473	Mechanical Vibration and Shock (3)
474	Fundamentals of Acoustics (3)
496	Mechanical Engineering Topics (v.)
611	Classical Thermodynamics (3)
612	Statistical Thermodynamics (3)
617	Advanced Thermal Environmental Engineering (3)
621	Conduction Heat Transfer (3)
622	Convection Heat Transfer (3)
623	Radiation Heat Transfer (3)
624	Gasdynamics (3)
625	Numerical Methods in Fluid Mechanics and Heat Transfer (3)
626	Viscous and Turbulent Flows (3)
628	Theory and Measurement of Turbulence (3)
630	Materials Science Laboratory (2)
631	Advanced Materials Science (3)
635	Corrosion Theory (3)
636	Materials for the Ocean Environment (3)
641	Theory of Mechanical Properties of Solids (3)
642	Mechanical Behavior of Engineering Materials (3)
657	Methods of Search and Optimization (3)
671	Mechanics of Continua I (3)
672	Mechanics of Continua II (3)
678	Advanced Dynamics (3)
696	Advanced Topics in Mechanical Engineering (v.)
697	Seminar (1)
699	Directed Reading or Research (v.)
800	Thesis (v.)



74

## Meteorology

### Graduate Faculty

C.S. Ramage, D.Sc. (Chairman)—tropical meteorology  
 C.W. Adams, M.S.—climatology, physical oceanography  
 W.C. Chiu, Ph.D.—atmospheric turbulence and oscillations  
 P.A. Daniels, Ph.D.—physical meteorology, atmospheric pollution  
 C.M. Fullerton, Ph.D.—cloud physics  
 T. Murakami, D.Sc.—general atmospheric circulation, numerical methods  
 D.J. Raymond, Ph.D.—dynamics  
 J.C. Sadler, M.S.—satellite meteorology, tropical meteorology  
 T. Takahashi, Ph.D.—cloud physics  
 R.C. Taylor, Ph.D.—tropical meteorology

### Affiliate Faculty

S. Price, B.S.—physical meteorology

### Degree Requirements (Plan A only)

**M.S.** A minimum of 24 credit hours of course work and 6 credit hours of thesis research. General and thesis examinations are required.

**Ph.D.** A reading comprehension of one foreign language with useful scientific literature in the field of the candidate. At some time during his first year of residence, the Ph.D. candidate may be required to pass

a screening examination prerequisite to proceeding toward the degree.

Intended candidates must present a thorough preparation in general physics, chemistry, and mathematics through calculus, as well as a minimum of 14 hours of undergraduate credit in meteorology including courses in climatology, instruments and observations, descriptive meteorology, and synoptic meteorology. Deficiencies in undergraduate preparation must be made up. Besides meteorology courses, courses may be allowed in the fields of oceanography, physics and mathematics.

### METEOROLOGY (Met)

- 639 Meteorology of the Tropical Oceans (2)
- 640 Advanced Tropical Meteorology Laboratory (3)
- 641 Monsoon Meteorology (3)
- 642 Seminar in Meteorological Sensors (3)
- 643 Cloud Physics (3)
- 644 Physical Meteorology (3)
- 646 Statistical Meteorology (3)
- 650 Advanced Theoretical Meteorology I (3)
- 651 Advanced Theoretical Meteorology II (3)
- 742 Atmospheric Turbulence (3)
- 745 Numerical Analysis and Weather Prediction I (5)
- 746 Numerical Analysis and Weather Prediction II (5)
- 752 Special Topics in Meteorology (3)
- 765 Seminar in Meteorology (1)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

## Microbiology

### Graduate Faculty

A.A. Benedict, Ph.D. (Chairman)—immunochemistry  
 B.G. Adams, Ph.D.—regulatory mechanisms of eucaryotic microorganisms  
 R.D. Allen, Ph.D.—ultrastructure and cell biology  
 P. Baumann, Ph.D.—taxonomy and physiology of marine bacteria  
 L.R. Berger, Ph.D.—general microbiology and microbial physiology  
 D.E. Contois, Ph.D.—general microbiology and microbial physiology  
 C.E. Folsome, Ph.D.—microbial genetics and exobiology  
 K.R. Gundersen, Ph.D.—marine microbiology and ecology  
 J.B. Hall, Ph.D.—comparative biochemistry and evolution  
 M. Herzberg, Ph.D.—host-parasite relationships and immunology  
 P.C. Loh, Ph.D.—animal virology and animal cell culture  
 B.Z. Siegel, Ph.D.—comparative biochemistry and cell biology

The department offers programs leading to the M.S. and Ph.D. in microbiology with areas of specialization in microbial biochemistry, genetics, and ultrastructure; the biology of infectious diseases; the biochemistry and genetics of viruses; immunology and immunochemistry; marine microbiology; developmental and cell biology; and exobiology. Research programs in interdisciplinary fields are possible. Studies in microbiology emphasize fundamental cellular and molecular approaches rather than those primarily of an applied or diagnostic character.

Undergraduate preparation in both biological and physical sciences, including biology, genetics, microbiology, organic and physical chemistry, physics, and calculus is desirable, but deficiencies in some of these areas do not preclude admission. Qualified students

with undergraduate majors in fields other than microbiology are welcomed. Ph.D. candidates are required to take an initial diagnostic examination and to demonstrate proficiency in one foreign language before graduation. Experience in teaching in a laboratory course is considered part of the training of the Ph.D. candidate. Official scores of the aptitude test and the advanced test in biology of the Graduate Record Examination and three letters of recommendation are required of all applicants.

Courses for the graduate program are to be selected from those listed below and from others offered in the related fields of biochemistry, biology, biophysics, botany, chemistry, genetics, mathematics, oceanography, public health, and zoology. Required courses are marked with an asterisk.

#### MICROBIOLOGY (Micro)

- 431 Microbial Biochemistry and Function (4)
- 451 Biology of Bacteria (4)
- 461 Immunology (4)
- 463 Microbiology of the Pathogens (4)
- 475 Microbial Genetics (4)
- 480 Microbial Ecology (4)
- 490 Virology (4)
- 625 Immunochemistry (3)
- 632 Advanced Microbial Physiology (3)
- 642 Marine Microbiology (3)
- 655 Virology (3)
- 661 Ultrastructure of Microorganisms (3)
- 665 Electron Microscopy (2)
- 671 Microbial Genetics (3)
- 675 Exobiology (3)
- 681 Host-Parasite Relationships (3)
- \*690 Seminar (1)
- \*699 Directed Research (v.)
- 795 Special Topics in Microbiology (v.)
- 800 Thesis Research (v.)

## Music

### Graduate Faculty

- L. Rowell, Ph.D. (Chairman)—music theory
- A.P. Brown, Ph.D.—musicology
- C. Chadwick-Cullen, M.M.—music performance, voice
- M. Kerr, M.M.—music performance, piano
- R.N. McKay, Ph.D.—music composition
- W. Pfeiffer, M.A.—music performance, voice
- A. Russell, A.M.D.—music composition
- B.B. Smith, M.M.—ethnomusicology
- A. Trubitt, D.M.—music composition
- R. Vaught, Ph.D.—musicology
- C. Wolz, M.A.—dance ethnology

Intended candidates for the master's degree in music must present an undergraduate degree with a major in music or an undergraduate degree in another field with evidence of an equivalent musical background. Applications should include two copies of transcripts.

The M.A. in music is offered with a concentration in dance ethnology, in ethnomusicology, in musicology,

in music education, and in music theory. The M.M. in music is offered with a concentration in composition and in performance. It is important that the student declare the specific concentration for which he will be an intended candidate at the time of his application. This declaration is important in determining possible deficiencies.

It is recommended that applicants take the Aptitude and Advanced Music Test of the Graduate Record Examination and have reports sent to the music department. For concentration in ethnomusicology and dance ethnology some undergraduate background in cultural anthropology is desirable and, depending on the field of thesis research, may be required. For concentration in dance ethnology a background in movement notation is required. For concentration in music education a record of teaching experience should be presented. For concentration in music theory some composition study is highly desirable. For concentration in composition three original compositions should be submitted which are representative of previous work in various forms and media. For concentration in performance the student must appear in an audition or if the applicant is not in Hawaii an unedited tape recording may be submitted which includes works representative of his abilities in various styles.

Before being admitted to candidacy the student is required to successfully complete the general examination. This is divided into three parts, covering (1) a basic theory background as included in the first two years (one year for dance ethnology) of the undergraduate major, (2) a broad knowledge of music literature from the Middle Ages to the present and (3) achievement in the area of the concentration. Students concentrating in composition will be examined in the area of form and analysis, counterpoint and orchestration.

Concentrations in composition, dance ethnology, ethnomusicology, musicology, and music theory follow the thesis plan only (Plan A). In composition the thesis consists of an original work in one of the larger forms plus a detailed essay on the background and problems involved or a detailed theoretical analysis. Concentration in performance follows the nonthesis program only (Plan B). Plan A requires 22 hours of course work and 8 hours of thesis. Plan B requires 30 hours of course work. For concentration in musicology a reading knowledge of French or German is required. Concentrations in music theory may fulfill their language requirement in either of the above languages or in Latin. For concentrations in ethnomusicology or dance ethnology, a reading or speaking knowledge of a foreign language (or equivalent technique in linguistics) is required. Candidates concentrating in music education may choose between the thesis program and the nonthesis program. Requirements for the Hawaii State Department of Education Professional Certificate may be met in the M.A. program in music education. A final oral examination is required in both the thesis and nonthesis programs.



Courses available for the graduate program are listed below.

## MUSIC (Mus)

- 401 Ensemble (1)  
 402 University Concert Choir (1)  
 404 Opera Workshop (3)  
 405 University Symphony Orchestra (1)  
 409 University Concert Band (1)  
 420 Music Literature Laboratory (2)  
     (1) Voice  
     (2) Piano  
 431 Advanced Applied Music (v.)  
 451 Advanced String Methods (2)  
 452 Advanced Woodwind Methods (2)  
 453 Advanced Brass Methods (2)  
 455 Advanced Percussion Methods (2)  
 457 Pacific and Asian Music in Education (2)  
 458 Voice Methods (2)  
 459 Piano Methods (2)  
 461 Symphonic Music (2)  
 462 Choral Music (2)  
 463 Opera (2)  
 464 Twentieth Century Music (2)  
 465 Chamber Music (2)  
 466 Music of the United States (2)  
 469 Keyboard Music (2)  
 470 Art Music of Asia (2)  
 471 Music of Non-Literate Peoples (3)  
 477 Musical Cultures (2)  
     (1) Japan  
     (2) India  
     (3) Vietnam  
 \*481-482 Advanced Orchestration (2-2)  
 \*483-484 Counterpoint (2-2)  
 \*485-486 Form and Analysis (2-2)  
 \*487-488 Composition (2-2)  
 \*489-490 Advanced Composition (2-2)  
 491-492 Movement Notation (2-2)  
 600 Seminar (3)  
     (1) composition  
     (2) ethnomusicology  
     (3) musicology  
     (4) performance repertory  
     (5) music education  
     (6) dance ethnology  
     (7) music theory  
 601 Advanced Ensemble (1)  
 625-626 Advanced Conducting (2-2)  
 635 Graduate-Level Applied Music (v.)  
 636 Graduate Recital (3)  
 651 Foundations in Music Education (2)  
 652 Problems in Music Education (2)  
 660 Studies in Music Literature (3)  
 661 Bibliography and Research Methods in Music (3)  
 670 Regional Musics (3)  
     (1) Asia  
     (2) Oceania  
 680 Advanced Problems in Music Theory (2)  
     (1) counterpoint  
     (2) form and analysis  
     (3) media  
     (4) pedagogy  
     (5) transcription of performance practices  
     (6) movement analysis  
 699 Directed Work (v.)  
 783-784 History of Theory (3-3)  
 785 Comparative Theory (3)  
 800 Thesis Research (v.)

\*Credit not available to candidates for a graduate degree in composition.

## Nursing

## Graduate Faculty

- E. Anderson, Ph.D. (Dean)—nursing research and curriculum  
 L. Bermosk, M.Litt. (Chairman)—mental health-psychiatric nursing  
 G. Felton, Ed.D.—medical-surgical nursing  
 Y. Gross, M.S.—community-health nursing

The program extends over four semesters and leads to a master of science degree. Under Plan B (nonthesis), a minimum of 48 semester hours must include: (1) one research course; (2) a seminar in nursing theory and practice; (3) courses in the area of specialization and related cognate fields; and (4) courses in a functional minor.

In addition to requirements for admission to the Graduate Division, the applicant must complete evidence of: (1) a baccalaureate degree with a major in nursing from an NLN accredited program; (2) completion of a course in elementary statistics; (3) licensure in Hawaii for the practice of nursing; and (4) official scores on the Graduate Record Examination Aptitude Test.

Recommendations for admission to candidacy are determined at the end of the first semester after the student's progress has been reviewed and his ability to undertake graduate study has been determined. Upon admission to candidacy, a program adviser is selected from the graduate faculty in the selected area of specialization.

The student is eligible for graduation upon successful completion of the course of study with a cumulative grade-point average of 3.0, as well as a grade-point average of 3.0 in the nursing major.

Areas of specialization are offered in the following fields: (1) Mental Health-Psychiatric Nursing, which focuses on the clinical specialist practitioner in one-to-one relationship therapy, group therapy and family therapy in the context of community psychiatry; (2) Community Health Nursing, which prepares a community health nursing specialist who will deliver family-centered nursing care in a variety of community settings (*not offered during 1971-1972*); and (3) Medical-Surgical Nursing, which is designed to prepare clinical specialists in nursing practice with patients who have medical or surgical conditions requiring hospital care and associated institutional services.

In addition to an area of specialization, each student selects a functional area of concentration in either teaching or nursing-service administration.

Additional details on the graduate programs in nursing are given in a *School of Nursing Bulletin*, which is available upon request.

## NURSING (Nurs)

- 602 Orientation to Nursing Research (3)  
 607 Seminar in Issues in Nursing (3)  
 615 Interaction Processes (3)  
 617 Concepts and Nursing Practice (3)  
 622 Advanced Nursing Concepts I. Mental Health-Psychiatric Nursing (4)  
 623 Advanced Nursing Concepts I. Community Health Nursing (4) (*not offered during 1971-1972*)

- 624 Advanced Nursing Concepts I, Medical-Surgical Nursing (4)  
 655-656 Advanced Psychiatric Concepts (3-3)  
 731 Advanced Nursing Concepts II, Mental Health-Psychiatric Nursing (4)  
 732 Advanced Nursing Concepts III, Mental Health-Psychiatric Nursing (4)  
 733 Advanced Nursing Concepts II, Community Health Nursing (4) (not offered during 1971-1972)  
 734 Advanced Nursing Concepts III, Community Health Nursing (4) (not offered during 1971-1972)  
 735 Advanced Nursing Concepts II, Medical-Surgical Nursing (4)  
 736 Advanced Nursing Concepts III, Medical-Surgical Nursing (4)  
 743 Concepts of Leadership in Nursing (3)  
 746 Seminar and Practicum in Nursing Service Administration (4)  
 747 Curriculum Development (3)  
 748 Seminar and Practicum in Teaching (4)  
 790 Directed Study or Research (v.) I, II, SS

## Nutritional Sciences

### Graduate Faculty

- R. Van Reen, Ph.D. (Chairman)—mineral metabolism, nutritional status  
 D.M. Hilker, Ph.D.—vitamins, toxic factors in foods  
 I.J. Lichten, Ph.D.—fluids and electrolytes, endocrinology  
 B.R. Standal, Ph.D.—protein metabolism, nutritional status  
 F. Young, Ph.D.—lipid metabolism, atherosclerosis

Intended candidates for the M.S. in nutrition must present an undergraduate major in foods and nutrition or equivalent preparation in a related field which includes as a minimum qualitative and quantitative chemical analysis, organic chemistry, biochemistry, vertebrate zoology or physiology and general physics. Undergraduate deficiencies, as determined by the faculty, must be completed during the program of study. Courses for the graduate major will be selected from those listed below along with such courses in related fields as may be considered advisable. Only Plan A (thesis) is offered. Candidates are required to complete a minimum of 30 credit hours including 10 credit hours of Nutr 800. Required courses are marked with an asterisk.

Additional details on the graduate program in nutritional sciences are given in a departmental brochure which is available upon request.

### NUTRITION (Nutr)

- 676 Nutritional and Metabolic Diseases (2)  
 677 Nutrition in Reproduction, Growth, Development and Senescence (3)  
 679 Mineral Metabolism (2)  
 680 Research Methods in Nutrition (3)  
 \*681 Seminar (1)  
 682 Nutritional Status (3)  
 684 Lipids in Health and Disease (2)  
 \*685-686 Advanced Human Nutrition (1-1)  
 688 Vitamins in Health and Disease (2)  
 \*699 Directed Readings and Research (2)  
 \*800 Thesis (10)

## Ocean Engineering

### Graduate Faculty

- C.L. Bretschneider, Ph.D. (Chairman)—civil engineering, physical oceanography  
 W.M. Adams, Ph.D.—geophysics, geophysical engineering  
 N.C. Burbank, Sc.D.—environmental engineering  
 J.C. Burgess, Ph.D.—engineering mechanics  
 J.P. Craven, Ph.D.—ocean sciences, law  
 F. Gerritsen, Ing. dip.—coastal and harbor engineering  
 R.A. Grace, Ph.D.—hydrodynamics and water resources  
 G.W. Groves, Ph.D.—oceanography  
 H.H. Hwang, Ph.D.—electrical engineering  
 J. Larsen-Badse, Ph.D.—materials science  
 A. Parvulescu, Ph.D.—mathematical science  
 L. Seidl, Ph.D.—naval architecture  
 M. St. Denis, D.Eng.—aeronautical engineering  
 W. Stuver, Ph.D.—mechanics, space dynamics  
 R. Szilard, Ph.D.—structures, applied mechanics  
 G. Venezian, Ph.D.—hydrodynamics, applied mathematics  
 J.A. Williams, Ph.D.—civil and ocean engineering, hydromechanics  
 K. Wyrcki, Ph.D.—physical oceanography

### Affiliates

- E. Link—Ocean Systems  
 G. Miller—ESSA  
 A. Tom—Sunn, Low, Tom & Hara, Inc.

The graduate program in ocean engineering is intended to channel the previous engineering experience of the student to ocean-related work. This work includes coastal and harbor engineering, marine structures, naval architecture, hydrodynamics and ocean acoustics. The department currently offers a master's and a doctoral program in ocean engineering.

An intended candidate for the master's program is expected to have a bachelor's degree in any of the classical engineering disciplines. Candidates with degrees other than in engineering will be considered for admission, but they may be required to make up deficiencies. Official scores in the GRE Aptitude tests must be submitted prior to admission.

The M.S. degree in ocean engineering can be earned by completing the requirements under one of two plans. Plan A (thesis program) requires a minimum of 30 credit hours, including 22 credit hours of course work and 8 of thesis research. 6 credit hours may be taken outside the College of Engineering and the department of oceanography. Two credits of graduate seminars in engineering or oceanography are required. A minimum of 18 credits must be in courses numbered 600-799.

Plan B (nonthesis) requires a minimum of 30 credit hours of course work. At least 6 credits must be outside the undergraduate field of specialization. Two credits of graduate seminars in engineering or oceanography are required. A minimum of 18 credits must be in courses numbered 600-799.

Students must make a choice of plan before 14 credits of graduate work applicable to the degree have been completed. A foreign language is not required.

All students will be required to take a general examination before they are advanced to candidacy. This examination is intended to reveal the quality of the student's preparation and his ability to pursue work

at the master's level. The student may be required to make up any deficiencies before advancement to candidacy.

In addition to the credit hour requirements, students will be required to take a final oral examination. For Plan A this examination covers the thesis and related subjects. The examination is conducted by the thesis committee and is open to the graduate faculty. For Plan B the examination covers the presentation of a seminar, which must be submitted to the committee as a written paper. The student will be questioned on the paper and related subjects.

The general and final examinations can only be repeated once. Students failing any of these examinations a second time will be dropped from the program.

Students seeking admission to the doctorate should have an M.S. degree in engineering. If they have an M.S. degree in another field, they may apply for a special examination to determine their qualifications. Exceptionally well-qualified students who meet the requirements for the M.S. program may be admitted to the Ph.D. program directly. Applicants must submit the official GRE Aptitude score prior to admission.

Students pursuing the doctoral program will be required to take an oral qualifying examination, an oral and written comprehensive examination and a final oral examination in defense of their dissertation. One foreign language is required. These examinations are described elsewhere in this bulletin.

The following courses are recommended for all students in ocean engineering.

OE	411	Buoyancy and Stability (3)
OE	601	Ocean Engineering Laboratory (3)
OE	603	Ocean Engineering Environment (3)
OE	609	Principles of Ocean Engineering (3)
OE	696	Topics in Ocean Engineering (2)
Ocn	620	Physical Oceanography (3)

Six credits of approved courses may be selected from physics, mathematics, chemistry, or geosciences. Additional courses normally will be selected from the following list:

#### OCEAN ENGINEERING (OE)

412	Resistance and Propulsion of Ships (3)
610	Viscous Fluid Dynamics (3)
611	Control of Ships (3)
612	Seakeeping (3)
614	Ocean Hydrodynamics Laboratory (2)
621	Introduction to Ocean Acoustics (3)
622	Sonar Systems Engineering (3)
623	Electro-acoustics (3)
631-632	Design of Ocean Structures I & II (3-3)
661-662	Coastal and Harbor Engineering (3-3)
663	Design of Coastal Structures (3)
664	Sediment Transport, Littoral Drift and Dredging Technology (3)
671	Submarine Vehicle Naval Architecture (3)
691	Special Topics in Ocean Engineering (v.)
692	Seminar in Ocean Engineering (1-1)
707-708	Statistical Dynamics of Ocean Systems I & II (3-3)

#### CIVIL ENGINEERING (CE)

411	Applied Probability and Statistics in Engineering (3)
621-622	Advanced Fluid Mechanics I & II (3-3)
635	Environmental and Sanitary Engineering Chemistry (4)
636	Environmental and Sanitary Engineering Microbiology (4)
641	Marine Disposal of Wastes (3)
655	Applied Soil Mechanics I (3)
671	Theory of Elasticity I (3)
674	Stability of Structures (3)
675	Theory of Vibrations (3)
676	Structural Dynamics (3)
678	Theory of Plates (3)
679	Theory of Thin Shells (3)
681	Advanced Indeterminate Structures (3)
682	Numerical Methods of Structural Analysis (3)
683	Advanced Reinforced Concrete Design I (3)
686	Numerical Methods in Continuum Mechanics (3)

#### ECONOMICS (Econ)

698	Marine Resources (3)
-----	----------------------

#### ELECTRICAL ENGINEERING (EE)

614	Analysis of Nonlinear Systems (3)
616	System Theory (3)
618	System Optimization (3)
623	Advanced Electronic Instrumentation (3)
646	Signal and Noise Theory (3)
652	Optimization Techniques in Control Systems (3)
655	Sampled-Data Control Systems (3)
656	Concepts of Systems Engineering (3)
661	Theory of Digital Machines (3)
671-672	Electromagnetic Theory and Applications (3-3)

#### INFORMATION SCIENCES (ISc)

443	Statistical Data Analysis (3)
641	Discrete State Stochastic Processes (3)
648	Theory of Inference (3)
650	Time Series Analysis (3)

#### MECHANICAL ENGINEERING (ME)

457	Marine Engineering (3)
474	Fundamentals of Acoustics (3)
621	Conduction Heat Transfer (3)
622	Convection Heat Transfer (3)
628	Theory and Measurement of Turbulence (3)
635	Corrosion Theory (3)
636	Materials for the Ocean Environment (2)
641	Theory of Mechanical Properties of Solids (3)

#### OCEANOGRAPHY (Ocean)

622	Geological Oceanography (3)
623	Chemical Oceanography (2)
640	Advanced Physical Oceanography (3)
642	Sedimentology II (3)
660	Ocean Wave Theory (3)
661	Tides (3)

## Oceanography

### Graduate Faculty

K.E. Chave, (Chairman), Ph.D.—chemical
J.E. Andrews, Ph.D.—geological
J. Caperon, Ph.D.—biological
T.A. Clarke, Ph.D.—biological
B.S. Gallagher, Ph.D.—physical
R.W. Grigg, Ph.D.—biological
G.W. Groves, Ph.D.—physical
W.A. Hardy, Ph.D.—physical
A. Malahoff, Ph.D.—geological
J.M. Miller, Ph.D.—biological
G.I. Murphy, Ph.D.—biological

E.D. Stroup, Ph.D.—physical  
 J. Struhsaker, Ph.D.—biological  
 A. Woodcock, D.Sc. (Hon.)—physical  
 K. Wyrski, Ph.D.—physical  
 R.E. Young, Ph.D.—biological

*Affiliate Faculty*

R. Barkley, Ph.D.—physical

The University currently offers a master's and a doctoral program in physical, chemical, geological, and biological oceanography.

Intended candidates should have a major in physics, chemistry, geology, geophysics, engineering, mathematics, biology, zoology, or botany. A minimum of one year of calculus, physics, and chemistry is required of all students prior to admittance. Depending upon the specific areas of interest, undergraduate deficiencies, if any, will be determined by the faculty. Graduate Record Examinations (Advanced and Aptitude) are required. Interested students should write to the department chairman for a brochure and further information.

Generally the student's first year is devoted to removing deficiencies and completing the four basic oceanography courses. Subsequently the student specializes depending on his disciplinary inclination.

Students pursuing a degree program must take the following courses or their equivalents: Ocn 620; 621; 622; 623.

The M.S. Program (Plan A) requires a minimum total of 30 credit hours; including 18 credits of course work and 12 credits of thesis research. The student is also required to take an oceanography seminar course and must show qualification in computer technology.

A candidate for the Ph.D. must pass a qualifying examination, a comprehensive examination and a final oral examination in defense of his dissertation. He must qualify in one foreign language and computer technology.

Courses listed below are available for credit in the degree program. Additional courses may be selected from the fields of botany, chemistry, engineering, geology, mathematics, meteorology, physics, and zoology.

It should be understood that many oceanography courses involve varying amounts of work at sea, although specific activity levels per course are not shown since lengths, objectives, and times of occurrence vary.

**OCEANOGRAPHY (Ocean)**

- 620 Physical Oceanography (3)
- 621 Biological Oceanography (3)
- 622 Geological Oceanography (3)
- 623 Chemical Oceanography (3)
- 630 Physical Oceanography Laboratory (1)
- 632 Littoral Geological Processes (3)
- 633 Chemical Oceanography Laboratory Methods (1)
- 636 Phytoplankton Ecology (3)
- 640 Advanced Physical Oceanography (3)
- 642 Sedimentology II (3)
- 643 Marine Geochemistry (3)
- 644 Marine Geophysics (3)
- 646 Zooplankton Ecology (3)



- 650 Mathematical Techniques for Biologists (3)
- 660 Ocean Wave Theory (3)
- 661 Tides (3)
- 662 Marine Hydrodynamics (3)
- 663 Measurements and Instrumentation (2)
- 664 Principles of Underwater Acoustics (3)
- 666 Nearshore Physical Oceanography (3)
- 672 Seminar in Geotectonics I (3)
- 673 Continental Shelves (3)
- 699 Directed Research (v.)
- 701 Nekton Ecology (3)
- 702 Deep Sea Biology (3)
- 705 Ecology and Management of Marine Resources (2)
- 735 Seminar in Oceanography (2)
- 750 Topics in Biological Oceanography (2)
- 760 Topics in Physical Oceanography (2)
- 770 Seminar in Chemical Oceanography (1)
- 799 Seminar (1)
- 800 Thesis Research (v.)

**Overseas Career Program**

The Overseas Career Program is a certificate program with a prescribed course of study designed to prepare Americans for service in Asia with governmental and international agencies, private institutions, and business; or service in fields concerned with Asians and Asian affairs. It is open only to students who are intended candidates for a graduate degree in one of the regular academic departments of the University and is designed to be useful to students who have not been abroad as well as to students who have lived in Asia.

Upon successful completion of the requirements of the Overseas Career Program (in addition to the requirements for a graduate degree in another field of study), an Overseas Career Certificate will be awarded. To obtain the certificate as well as the graduate degree

will, in some cases, take a longer period of time than would be required for the degree alone.

Each student's course of study is tailored to fit his individual needs in preparation for an overseas career. The requirements for the certificate include 15 hours of credit at the graduate level and competence in an Asian language:

6 hours—Asia-America: Men and Institutions, a two-semester inter-disciplinary seminar required of all candidates for the certificate.

6 hours—two courses in area studies in one Asian country or region and related elective courses; one or both may be included in the student's regular degree program.

3 hours—Internship in an Asian country, field experience for approximately 6 months with governmental or private agencies in Asia; periodic and final reports are required.

Asian language—proficiency at the intermediate level.

The requirements for an internship and area studies may be waived if the student presents satisfactory evidence of equivalent knowledge and experience.

Faculty include:

W.G. Hackler, M.A.—director  
A.D. Moscotti, Ph.D.—associate director

#### OVERSEAS CAREER PROGRAM (OCP)

631-632 Asia-America: Studies of Men and Institutions (3-3)  
791 Internship in an Asian country (3)

### Pacific Islands Studies

#### Graduate Faculty

N. Meller, Ph.D. (Director)—political science  
E. Barnet, Ph.D.—travel industry management  
D. Cox, Ph.D.—geology  
J.H. Cox, M.A.—art  
D. Johnson, Ph.D.—history  
C. Lamoureux, Ph.D.—botany  
F. Mahony, Ph.D.—anthropology  
D. Oliver, Ph.D.—anthropology  
P. Pirie, Ph.D.—geography  
M. Reddin, Ed.D.—education

Intended candidates for an M.A. in Pacific Islands studies must have an undergraduate background of 18 hours of credit (or the equivalent) in courses related to the Pacific Islands. The region is defined as Micronesia, Melanesia and Polynesia including Hawaii and New Zealand in their Polynesian aspects. These credits should include a basic Pacific-related course in anthropology, geography, or history. Candidates are urged to have a reading or field knowledge of a foreign language useful in thesis research. These would include French, German, Japanese, Spanish or any of the languages indigenous to the islands. Prerequisites may be satisfied by course work while enrolled at the University prior to admission to candidacy.

The graduate program in Pacific Islands studies is designed primarily for students who have taken a B.A. in a discipline and who wish to focus their work at the M.A. level regionally in the Pacific. Only the master's degree is offered and this should be considered terminal. The degree is offered only under Plan A which requires a thesis. Graduate Record Examination aptitude scores must be submitted when applying for admission.

#### Requirements

- a. At least 21 credit hours in graduate level courses of which at least 12 credits, exclusive of research methods courses, must be in courses numbered 600-799 including at least one graduate seminar.
- b. A general examination designed to reveal the quality of the student's preparation prior to the advance to candidacy. The thesis proposal is also reviewed and accepted at this time.
- c. A completed thesis (carrying 9 credit hours).
- d. A final oral examination covering the thesis and related areas.

Courses should be selected to provide an integrated program bearing upon a particular concentration of interest. At least three disciplines must be represented. A list of courses bearing upon the Pacific to be offered in any one year is available from the director. These courses will usually be found in the offerings of the following fields: agricultural economics, anthropology, architecture, art, English, geography, history, linguistics, music, political science, psychology, public health, sociology, speech-communication, and zoology-botany. Courses in other areas will be allowed if they contribute to an approved program.

#### PACIFIC ISLANDS PROGRAM (PIP)

390 Pacific Seminar (selected topics)  
699 Directed Research (v.)  
800 Thesis Research (v.)

### Pacific Urban Studies and Planning Program

The Pacific Urban Studies and Planning Program is a multidisciplinary endeavor, located in the College of Arts and Sciences and guided by the participating academic departments and professional schools—architecture, economics, engineering, geography, political science, public health, social work and sociology. These departments and schools join with the program in offering graduate studies emphasizing planning and urban and regional development. The program sponsors and facilitates problem oriented research on urban and planning problems, particularly those relevant to Hawaii, the Pacific Basin and Asia and participates in, coordinates with and supports related University efforts.

Study programs are individually arranged in consultation with advisers in the participating units. Common elements include an urban (or regional) and plan-

ning-focused master's program within one of the participating departments or schools, related course work in disciplines other than the major field and participation in the Planning Practicum, a two course series, in which students engage in a cooperative planning project. Successful completion of the program leads to award of a master's degree in the student's chosen field and a certificate in planning and urban (or regional) studies. The minimum number of credit hours for the degree and certificate is 36.

For further information regarding the program, a student should write the chairman of the department or dean of the professional school in which he is interested or to the Director, Pacific Urban Studies and Planning Program, University of Hawaii, 2540 Maile Way, Spalding 354, Honolulu, Hawaii 96822.

#### PLANNING (Plan)

- 600 Contemporary Planning Theory (3) I
- 601 Introduction to Planning Systems (3) I
- 695 Planning Practicum (3) II
- 696 Planning Practicum (3) I

### Pharmacology

#### Graduate Faculty

- B.K.B. Lum, Ph.D., M.D.(Chairman)—autonomic and cardiovascular pharmacology
- L.J. Casarett, Ph.D.—toxicology
- S.C. Chou, Ph.D.—molecular pharmacology
- W.C. Cutting, M.D.—chemotherapy
- E. Furusawa, M.D.—virus chemotherapy
- J.F. Lenney, Ph.D.—biochemical pharmacology
- T.R. Norton, Ph.D.—medicinal chemistry
- D.D. Palmer, M.D.—dermatologic pharmacology
- S. Ramanathan, Ph.D.—medical chemistry
- G.W. Read, Ph.D.—cardiovascular pharmacology
- S. Shibata, M.D., Ph.D.—cardiovascular pharmacology

The department of pharmacology offers the requisite work for medical students, and for the M.S. and Ph.D. degrees.

Intended candidates for the M.S. or Ph.D. in pharmacology must have or acquire adequate preparation in biology, chemistry, physics and mathematics. The course work required includes basic courses in related sciences, or demonstrated competence in these fields, plus other courses adapted to the needs of the particular students as determined by the major professor and the thesis committee. Most students will be expected to take graduate courses in biochemistry, physiology and pharmacology. Elective courses in pathology, microbiology, anatomy, chemistry and clinical medicine will be recommended.

The departmental policies in regard to examinations which are optional to fields of study are as follows: (1) general examination for the M.S. degree: not required, (2) final examination for the M.S. degree: required (3) Ph.D. qualifying examination: not required. A minimum of 30 credits of course work is required for the Plan A M.S. degree program of the department with 6 credits being derived from the thesis research work.

#### PHARMACOLOGY (Pharm)

- 600 Pharmacology: Actions and Uses of Drugs (7)
- 613-614 Seminar in Pharmacology (1)
- 615 Toxicology (4)
- 631-632 Med. Chem. and Structure-Activity Relationships (3-3)
- 634 Molecular Pharmacology (2)
- 635 Experimental Chemotherapy (1)
- 637 Autonomic Nervous System Pharmacology (2)
- 639 Advanced Cardiovascular Pharmacology (2)
- 699 Directed Research (v.)
- 800 Thesis Research (v.)

### Philosophy

#### Graduate Faculty

- W.E. Nagley, Ph.D. (Chairman)—philosophy of religion, existential philosophy
- F.L. Bender, Ph.D.—social and political philosophy, phenomenology
- C.Y. Chang, Ph.D.—Chinese philosophy, Taoism and Ch'an Buddhism
- C.Y. Cheng, Ph.D.—philosophy of language, Chinese logic and methodology, Confucian philosophy
- I.M. Copi, Ph.D.—logic, metaphysics
- E. Deutsch, Ph.D.—Indian and comparative philosophy
- L.E. Goodman, D. Phil.—metaphysics, ethics, Islamic and Arabic philosophy
- H.E. McCarthy, Ph.D.—history of philosophy, philosophy of art, philosophy in literature
- J.L. Mehta, Ph.D.—phenomenology, German philosophy, Indian philosophy, comparative philosophy
- K.N. Upadhyaya, Ph.D.—Indian philosophy, Buddhist philosophy
- B.T. Yamasaki, Ph.D. (Associate Chairman)—rationalism, philosophy of religion, aesthetics

Intended candidates for the M.A. or the Ph.D. must present a minimum undergraduate background of 30 credits in philosophy, including courses in history of philosophy, ethics, and logic. Related courses in anthropology, art, drama, Far Eastern studies, history, literature, mathematics, psychology, sociology, and the biological and physical sciences are recommended. In support of the application for admission, American students are required to take the Graduate Record Examination (GRE)—both the Aptitude (Qualitative and Quantitative) and the Advanced Test (No. 74: Philosophy)—and have the results forwarded to the philosophy department.

Degrees are offered in three specific areas of philosophy. (1) **Western Philosophy.** All graduate students in philosophy must acquire a first-rate knowledge of the history and problems of Western philosophy. The Western tradition is the lecture and research frame of reference for the department and serves as the base of operations for its unique work in the Asian and comparative fields. (2) **Asian Philosophy.** Resting on the mandatory mastery of the Western field, the department offers the Asian field of specialization. Three areas in the Asian field are available: Indian, Buddhist, or Chinese. (3) **Comparative Philosophy.** In this field the candidate elects a comparison of any one of the three Asian fields, Indian, Buddhist, or Chinese, with any one of the three Western fields, Greek, Modern Classical, or Contemporary.



Reading competence in two foreign languages, selected to accord with the area of dissertation research, is required of each Western Ph.D. degree candidate; one Asian language for the Asian Ph.D. degree candidate; and one Asian and one Western foreign language for the Comparative Ph.D. degree candidate.

### Western

#### PHILOSOPHY (Phil)

- 300 Greek Philosophy (3)
- 302 Medieval Philosophy (3)
- 304 British Empiricism (3)
- 306 Continental Rationalism (3)
- 308 Nineteenth-Century Philosophy (3)
- 310 Twentieth-Century Philosophy (3)
- 315 Ethical Theory (3)
- 340 Survey of Islamic Philosophy (3)
- 400 Political Philosophy (3)
- 401 Social Philosophy (3)
- 402 Philosophy of Law (3)
- 403 Marxist Philosophy (3)
- 405 American Philosophy (3)
- 410 Philosophy of the Physical Sciences (3)
- 415 Philosophy of the Social Sciences (3)
- 417 Theory of Knowledge (3)
- 418 Metaphysics (3)
- 420 Philosophy of Art (3)
- 422 Philosophy and Psychoanalysis (3)
- 425 Philosophy in Literature (3)
- 427 Kafka (3)
- 428 Samuel Beckett (3)
- 430 Existential Philosophy (3)
- 435 Philosophy of Religion (3)
- 440 Introduction to Phenomenology (3)
- 445 Symbolic Logic I (3)
- 600 Problems of Philosophy (3)
- 604 Metaphysics of Language (3)
- 605 Philosophy of Language (3)
- 611 Symbolic Logic II (3)
- 700 Individual Western Philosophers (3)
- 715 Philosophy of Mathematics (3)
- 720 Seminar in Ancient-Medieval Philosophy (3)
- 725 Seminar in Modern Classical Philosophy (3)
- 730 Seminar in Contemporary Philosophy (3)
- 740 Seminar in Philosophy of Science (3)
- 800 Thesis Research (v.)

### Asian and Comparative

- 450 Indian Philosophy (3)
- 460 Buddhist Philosophy (3)
- 470 Chinese Philosophy (3)
- 480 Philosophy, East and West (3)
- 485 Modern Japanese Philosophy (3)
- 650 Individual Asian Philosophers (3)
- 655 Vedanta (3)
- 656 Indian Social Philosophy (3)
- 660 Theravada Buddhist Philosophy (3)
- 661 Mahayana Buddhist Philosophy (3)
- 662 Ch'an (Zen) Philosophy (3)
- 670 Confucianism (3)
- 671 Neo-Confucianism (3)
- 672 Taoism (3)
- 750 Seminar in Indian Philosophy (3)
- 760 Seminar in Buddhist Philosophy (3)
- 770 Seminar in Chinese Philosophy (3)
- 780 Seminar in Comparative Philosophy (3)
- 795 Philosophical Texts (3)
- 799 Directed Research (Greek, Modern Classical, Contemporary Western, Indian, Buddhist, Chinese, and Comparative) (v.)
- 800 Thesis Research (v.)

### Physics

#### Graduate Faculty

- J.R. Holmes, Ph.D. (Chairman)—optics, spectroscopy
- R.J. Cence, Ph.D.—elementary particles
- P. Crooker, Ph.D.—spectroscopy
- P.N. Dobson, Ph.D.—theoretical physics
- C. Hayes, Ph.D.—mathematical physics
- B.L. Henke, Ph.D.—ultra-soft x-rays
- H.C. McAllister, Ph.D.—optics, spectroscopy
- S. Pakvasa, Ph.D.—theoretical physics
- M.W. Peters, Ph.D.—high energy physics
- V.Z. Peterson, Ph.D.—elementary particles
- W. Pong, Ph.D.—solid state
- W.M. Shyu, Ph.D.—theoretical solid state physics
- W.R. Steiger, Ph.D.—optics, atmospheric and solar physics
- V.J. Stenger, Ph.D.—elementary particles
- S.F. Tuan, Ph.D.—theoretical physics
- M.S. Watanabe, Ph.D.—theoretical physics
- D. Yount, Ph.D.—elementary particles

Intended candidates for the M.S. or Ph.D. in physics must present a minimum of 35 semester hours of undergraduate credits in physics, including atomic and nuclear physics, electromagnetism, mechanics, optics, and thermodynamics. Courses in general chemistry and differential equations are also required. Official scores of the Aptitude test and the Advanced (Physics) test of the Graduate Record Examination must be submitted prior to admission. M.S. must be completed before Ph.D. is attempted.

Courses available for the graduate program are listed below. Required courses for the physics M.S. are marked with an asterisk. Additional courses may be selected, with approval, in mathematics, chemistry, meteorology, engineering, and philosophy. All graduate students are required to attend the weekly department seminar.

#### PHYSICS (Phys)

- 440 Solid State Physics (3)
- 490 Quantum Electronics (3)
- \*600 Methods of Theoretical Physics I (3)
- 601 Methods of Theoretical Physics II (3)
- \*610 Analytical Mechanics I (3)
- 611 Analytical Mechanics II (3)
- 620 Physics of the Upper Atmosphere
- \*650 Electrodynamics I (3)
- 651 Electrodynamics II (3)
- 660 Advanced Optics (3)
- \*690 Seminar (1)
- 695 Seminar on Atomic and Solid State Physics (1)
- 700 Seminar on Elementary Particle Physics (1)
- 711 Advanced Topics in Theoretical Physics (3)
- 730 Statistical Mechanics (3)
- \*770 Quantum Mechanics I (3)
- 771 Quantum Mechanics II (3)
- 772 Relativistic Quantum Mechanics (3)
- 777 Nuclear Physics I (3)
- 778 Nuclear Physics II (3)
- 780 Atomic and Molecular Spectra (3)
- 785 Solid State Theory (3)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

## Physiology

### Graduate Faculty

T.A. Rogers, Ph.D. (Chairman)—environmental physiology  
 S. Batkin, M.D.—neurophysiology  
 V.J. DeFeo, Ph.D.—reproductive physiology  
 K.D. Gardner, M.D.—renal physiology  
 H.L. Gillary, Ph.D.—physiology of sense organs  
 I.F.G. Hampton, Ph.D.—environmental physiology, exercise  
 S.K. Hong, M.D., Ph.D.—environmental and renal physiology  
 F.I. Kamemoto, Ph.D.—endocrinology, osmoregulation  
 I.J. Lichten, Ph.D.—endocrinology, fluid balance  
 Y.C. Lin, Ph.D.—cardiovascular physiology  
 T.O. Moore, Ph.D.—environmental physiology, biorhythms  
 M.D. Rayner, Ph.D.—nerve-muscle physiology  
 O. Wayman, Ph.D.—reproductive physiology  
 G.C. Whittow, Ph.D.—thermoregulation, physiological ecology  
 P.B. van Weel, Ph.D.—physiological ecology

### Affiliate Faculty

R.L. Pepper, Ph.D.—psychology, marine mammal biology  
 J. Pegg, M.D.—diving and hyperbaric physiology

The department of physiology offers undergraduate and graduate courses and provides a major input to those interdisciplinary courses (BIOMD numbers) which are required for first year medical students. Intended candidates for the M.S. or Ph.D. must have or acquire adequate preparation in biology, chemistry, physics and mathematics. The course work required includes the graduate level BIOMD courses and basic courses in related sciences, or demonstrated competence in these fields (which may include biochemistry, pharmacology, biophysics, or nutrition), plus other course work adapted to the needs of the particular student as determined by the major professor and the thesis committee. Students will be expected to develop a thorough knowledge of human, mammalian and/or comparative physiology with particular emphasis on their special fields of interest. All students must have or obtain adequate knowledge of the design of experiments, statistical methods, including the use of computers, and, in many instances, bioengineering and the use of isotopes in physiological research.

### PHYSIOLOGY (Physl)

603-604 Seminar in Physiology (1-1)  
 605 Physiology of Nerve and Muscle (3)  
 606 Comparative Physiology of Thermoregulation (3)  
 607 Physiological Adaptation to the Environment (2)  
 608 Advanced Renal Physiology (2)  
 609 Cardiovascular and Respiratory Physiology (3)  
 610 Advanced Physiology Laboratory (2)  
 699 Directed Research (v.)  
 701 Diving Physiology (3)  
 800 Thesis Research (v.)

### BIOMD

601 Cell Structure and Function (3)  
 602 Endocrinology and Reproduction (3)  
 603 Organ Structure and Function (7)  
 604 Neuroscience (4)

## Plant Pathology

See the **Botanical Sciences** field of study for M.S. and Ph.D. programs in the subdiscipline of plant pathology.

## Political Science

### Graduate Faculty

M.J. Shapiro, Ph.D. (Chairman)—political theory  
 L. Aischuler, Ph.D.—comparative politics, political development  
 T. Becker, Ph.D.—judicial process, political theory  
 R.S. Cahill, Ph.D.—politics, political theory  
 J. Dator, Ph.D.—Japanese politics, political futures  
 H.J. Friedman, Ph.D.—comparative administration, comparative politics  
 A.J. Gregor, Ph.D.—political theory  
 M. Haas, Ph.D.—international relations, political development  
 M. Henningsen, Ph.D.—political theory  
 P.E. Jacob, Ph.D.—political development, international organization  
 H.S. Kariel, Ph.D.—political theory  
 G. Kent, Ph.D.—international relations  
 Y. Kuroda, Ph.D.—comparative politics, political socialization  
 W. Levi, Ph.D.—international relations, comparative politics  
 N. Meller, Ph.D.—public administration, legislative behavior  
 C. Neff, Ph.D.—international relations, comparative politics  
 D.E. Neubauer, Ph.D.—political behavior  
 L. Nitz, Ph.D.—decision making, political theory  
 G.D. Paige, Ph.D.—political development, leadership  
 F.W. Riggs, Ph.D.—comparative administration, development administration  
 I.H. Rohter, Ph.D.—political psychology, racial ideologies  
 R.J. Rummel, Ph.D.—international relations, systems theory  
 G. Schubert, Ph.D.—political behavior  
 R.B. Stauffer, Ph.D.—comparative politics, political development  
 J. Vincent, Ph.D.—international relations  
 J. Wilson, Ph.D.—biopolitics, political theory

Applicants must submit to the department letters of recommendation, secure and fill out departmental application forms in addition to those of the Graduate Division, and submit to the department scores from the Graduate Record Examination. Interested students should write the department chairman's assistant for further information.

Intended candidates for the master's degree will select a thesis or nonthesis program in consultation with their advisers. A student will be advised that he can be admitted to candidacy only after successful completion of the oral hearing on the thesis proposal for Plan A, and only after successful completion of 9 credits in political science at the University of Hawaii for Plan B. Thesis students will focus their research efforts in one of the four program areas and will submit a program proposal to a committee which will conduct the oral hearing.

A Ph.D. student will select his research topic from one of the four program areas and will submit his dissertation proposal to a committee which will conduct an oral hearing, to be held either before or after completion of a written comprehensive examination. The comprehensive examination will be given within the

framework of the existing four programs. A student will be advised that he can be admitted to candidacy only after successful approval of his proposed program and upon completion of the comprehensive examination and the oral hearing on his dissertation proposal.

All courses numbered above 602 may be repeated for credit with permission of an adviser. Every student must pass one course in each of the four programs. The course content of all courses, except the 600-602 sequence may vary each semester or with each instructor.

#### POLITICAL SCIENCE (PolSc)

- 600 Scope and Methods of Political Science (3)
- 601 Political Analysis, Theory Building and Techniques (3)
- 602 Research Practicum (3)
- 610 Political Thought (3)
- \*710 Seminar: Political Thought (3)

#### Decision Making

- 620 American Government (3)
- 650 Public Administration Theory (3)
- 651 Functional Aspects of Public Administration (3)
- 660 Public Law and Judicial Systems (3)
- 670 Politics (3)
- \*720 Seminar: American Government (3)
- \*750 Seminar: Public Administration (3)
- \*760 Seminar: Judicial Systems (3)
- \*770 Seminar: Politics (3)

#### Political Development

- 640 Comparative Government and Politics (3)
- 650 Public Administration Theory (3)
- 660 Public Law and Judicial Systems (3)
- 670 Politics (3)
- \*740 Seminar: Comparative Government and Politics (3)
- \*750 Seminar: Public Administration (3)
- \*760 Seminar: Judicial Systems (3)
- \*770 Seminar: Politics (3)

#### International Relations

- 630 International Relations (3)
- 631 International Relations of Asia (3)
- \*730 Seminar: International Relations (3)

#### General

- 699 Directed Reading and Research (v.)
- 800 Thesis Research (v.)

#### Population Studies

Population Studies is a certificate program and is interdisciplinary, involving the departments of anthropology, economics, geography, and sociology. The program is designed primarily for students who are candidates for an advanced degree—M.A. or Ph.D.—in one of the cooperating departments and who wish to acquire an understanding of demographic structures and processes and to develop a special competence in the application of the concepts and tools of their primary discipline to the study of various aspects of the population problem. The program emphasizes the social and economic aspects of the causes and consequences of population trends and examines the ra-

tionale and the ways by which societies attempt to modify these trends, with particular reference to the Asian and Pacific area. Special attention is paid to training in techniques of demographic analysis appropriate for deficient and erroneous data.

Students successfully completing an approved sequence of at least five courses in population—two of which may be selected from a list of courses in that field offered by various departments—obtain a Certificate in Population Studies.

Faculty for the courses listed below and especially responsible for the program include the following:

- P. Demeny, Ph.D. (Director)—economics
- M. Chapman, Ph.D.—geography
- L.J. Cho, Ph.D.—sociology
- J.A. Palmore, Ph.D.—sociology
- P.N.D. Pirie, Ph.D.—geography

#### POPULATION STUDIES (Pop)

- 650 Introduction to Demography (3)
- 691 Methods of Demographic Analysis (3)
- 692 Techniques of Estimation from Limited Data (3)
- 699 Directed Reading and Research (v.)
- 750 Interdisciplinary Seminar in Population Studies (3)

#### Psychology

##### Graduate Faculty

- R.C. Johnson, Ph.D. (Chairman)—social-developmental
- A. Arkoff, Ph.D.—clinical
- H.M. Bitner, Ph.D.—counseling
- R.J. Blanchard, Ph.D.—experimental
- J.G. Carlson, Ph.D.—learning theory and human behavior extensions
- D.H. Crowell, Ph.D.—developmental
- J.M. Denny, Ph.D.—counseling
- A.L. Diamond, Ph.D.—experimental
- M.J. Diamond, Ph.D.—clinical-social
- J.M. Digman, Ph.D.—personality
- R.A. Dubanoski, Ph.D.—developmental
- W.J.M. (Ian) Evans, Ph.D.—clinical
- R.G. Gallimore, Ph.D.—social
- L.M. Herman, Ph.D.—experimental
- W.S. MacDonald, Ph.D.—clinical
- H.H. Mansson, Ph.D.—social
- A.J. Marsella, Ph.D.—clinical
- J. Michel, Ph.D.—counseling
- K.A. Minke, Ph.D.—learning theory and human behavior extensions
- M.D. Murray, Ph.D.—social
- C.R. O'Donnell, Ph.D.—clinical
- T.S. Rodgers, Ph.D.—psycholinguistics
- S.I. Shapiro, Ph.D.—learning theory and human behavior extensions
- A.W. Staats, Ph.D.—learning theory and human behavior extensions
- G. Tanabe, Ph.D.—clinical-developmental
- R.G. Tharp, Ph.D.—clinical
- M.S. Warner, Ph.D.—developmental
- D.L. Watson, Ph.D.—personality
- H.B. Weaver, Ph.D.—applied social, environmental

##### Emeriti

- C.J. Herrick, Ph.D.—clinical
- S.D. Porteus, Sc.D.—clinical

##### Affiliate Faculty

- H. Gudeman, Ph.D.—clinical

Intended candidates for graduate degrees must present 18 hours of undergraduate work in psychology, including general and experimental psychology and statistics.

The M.A. degree may be pursued only by Plan A (required thesis).

Programs leading to the Ph.D. are available in five fields of specialization: experimental; developmental; social-personality; clinical; learning theory and human behavior extensions. Applicants interested in further information should write to the chairman directly.

Intended candidates for the Ph.D. may, under special circumstances offer 30 course credits in lieu of the M.A. degree, although all students without the M.A. degree from an American university must enter the program as intended candidates for the M.A. degree.

Official scores of the Aptitude and Advanced (Psychology) Tests of the Graduate Record Examination and of the Miller Analogies Test are required when applying for admission.

Additional details concerning programs, facilities, and financial assistance are available from the department.

#### PSYCHOLOGY (Psy)

- 401 Experimental Analysis of Behavior (3)
- 423 History of Psychology (3)
- 424 Abnormal Psychology (3)
- 425 Psychological Testing (3)
- 426 Industrial Psychology (3)
- 427 The Exceptional Child (3)
- 428 Social Development of Children (3)
- 430 Complex Human Learning (3)
- 431 Verbal Learning and Memory (3)
- 471 Environmental Psychology (3)

#### Methodology

- 601 Introduction to Quantitative Methods (3)
- 602 Statistical Analysis (3)
- 603 Design and Analysis of Psychological Experiments (3)
- 604 Scaling Methods (3)
- 605 Problems of Measurement and Evaluation (3)
- 606 Multivariate Methods (3)
- 607 Introduction to Mathematical Models (3)
- 714 Survey Research Methods (3-3)

#### Experimental Psychology

- 630 Experimental Method (3)
- 631 Methods in Social Psychology (3)
- 633 Comparative Psychology (3)
- 634 Physiological Psychology (3)
- 635 Sensory Processes and Psychophysics (3)
- 636-637 Learning and Motivation (3-3)
- 638 Perception (3)
- 640 Verbal Learning (3)
- 641 Skill Learning (3)
- 643 Cognitive Processes (3)
- 644 Mathematical Models (3)
- 649 Instrumentation
- 730 Research in Experimental Psychology (3)

#### Developmental Psychology

- 653 Infant Development and Behavior (3)
- 654 Cognitive Development (3)

- 655 Learning, Language, and Intellectual Function (3)
- 656 Social Learning and Personality (3)
- 750 Research in Developmental Psychology (3)

#### Social-Personality

- 660 Personality: Theory and Research (3)
- 661 Personality and Social Interaction (3)
- 662 Social Psychology (3)
- 663 Behavior in Groups (3)
- 664 Attitude Development and Change (3)
- 665 Cross-Cultural Psychology (3)
- 666 Psychology and Social Issues (3)
- 670 Applied Social Psychology (3)
- 671 Advanced Environmental Psychology (3)
- 760 Research in Personality (3)
- 762 Research in Social Psychology (3)

#### Clinical Psychology

- 675-676 Behavior Assessment (2-2)
- 677-678 Behavior Assessment Laboratory (1-1)
- 681 Childhood Behavior Disorders and Intervention (3)
- 682 Adult Behavior Disorders and Intervention (3)
- 683 Social Behavior Disorders and Intervention (3)
- 685 Child Learning Laboratory (3-3)
- 687 Practicum in Behavior Change: Community Issues (3)
- 688 Practicum in Behavior Change in Children (3)
- 689 Practicum in Behavior Change in Adults (3)
- 690 Practicum in Clinical Psychology (v.)
- 790 Research in Clinical Psychology (3)
- 795 Internship (0-0)

#### Learning Theory and Human Behavior Extensions

The general purpose of this concentration is to provide a common core of work for graduate students which will focus upon the principles and methods of the field of learning, and also include courses that extend the basic principles to various areas of human behavior. In addition, the graduate student in the concentration will be expected to select some area of specialization within which he wishes to major. This area could be anywhere along the continuum from the basic field to applications of the principles to clinical, child, or social psychology, educational psychology, or areas in the social sciences—or to fields such as child learning, behavior modification, social learning, language and verbal learning, basic animal learning.

#### Other

- 699 Directed Reading or Research (v.)
- 700 Seminar (3):
  - (1) General
  - (2) History and Theory
  - (3) Statistics and Measurement
  - (4) Experimental
  - (5) Physiological
  - (6) Personality
  - (7) Social
  - (8) Developmental
  - (9) Applied-Industrial
  - (10) Clinical
  - (11) Comparative
  - (12) Learning
  - (13) Perception
  - (14) Psychopathology
  - (15) Psychological Therapies
- 710 Seminar in Teaching Psychology (1)
- 800 Thesis, Dissertation Research (v.)

## Public Health

### Graduate Faculty

- E. O'Rourke, M.D., M.P.H. (Chairman)—public health administration  
 R.W. Armstrong, Ph.D., M.P.H.—comprehensive health planning  
 J.E. Banta, M.D., M.P.H.—international health  
 T.L. Bell, M.S.P.H., Ph.D.—public health laboratory  
 E. Bertellotti, M.P.H., M.S.—public health education and administration  
 N.C. Burbank, Jr., Sc.D.—environmental health and sanitary engineering  
 M. Chun, Ph.D.—environmental health and sanitary engineering  
 C.S. Chung, Ph.D.—biostatistics  
 E.W. Clark, Dr.P.H.—public health education  
 R.H. Conway, Dr.P.H.—health services administration  
 D.L. Davenport, M.P.H., Ed.S.—public health education  
 L.E. Dickinson, M.D., Dr.P.H.—epidemiology  
 S. Furuno, M.S.P.H., Ph.D.—mental retardation  
 F.I. Gilbert, Jr., M.D.—community health  
 W. P. Golden, Jr., Ed.D.—public health education  
 J. Grossman, M.P.H., Ph.D.—public health education  
 J.H. Hankin, M.S., Dr.P.H.—public health nutrition  
 J.M. Johnson, Ph.D.—environmental sanitation  
 R.K.C. Lee, M.D., Dr.P.H. (Dean Emeritus)—public health administration  
 M. Lim, M.R.C.S., L.R.C.P., D.P.H.—population and family planning  
 A.M. Lenzer, Ph.D.—gerontology  
 Y.S. Matsumoto, Ph.D.—population and family planning  
 J.M. Michael, M.S., M.P.H.—public health administration and health planning  
 R.E. Mytinger, Dr.P.H.—health services administration  
 C.B. Park, M.D., Dr.P.H.—biostatistics  
 A.D. Schwartz, M.D., M.P.H.—mental health  
 R.G. Smith, M.D., M.P.H.—maternal and child health  
 R. Suehiro, M.P.H.—international health  
 E. Voulgaropoulos, M.D., M.P.H.—international health  
 R.J. Wolff, Ph.D.—behavioral sciences  
 R.M. Worth, M.D., M.P.H., Ph.D.—epidemiology  
 R.H.F. Young, Sc.D.—environmental health and sanitary engineering

The School of Public Health offers a wide range of programs designed to meet the needs of a varied student body. In addition to basic work in public health common to all students in the school, candidates are expected to pursue intensive work in a selected area of emphasis within the public health field. The broad areas of program emphasis offered include: administration (including comprehensive health planning, health services administration and public health administration), biostatistics, environmental health (including sanitation and public health engineering), epidemiology (including public health laboratory), international health, maternal and child health (including mental retardation), mental health, population and family planning studies, public health education, and public health nutrition. Program content may combine more than one area of emphasis for eligible students. Such expanded programs will usually require an additional semester of study.

### Master of Public Health Degree

The M.P.H. program is designed to prepare persons for a variety of careers in the broad field of public health at local, state, national, and international levels.

The degree candidate must meet the minimum admission requirements of the Graduate Division and present a minimum of 18 semester credits in the physical and social sciences. Applicants must also submit a Graduate Record Examination score for the aptitude test. Depending upon the area of emphasis selected, different undergraduate preparation may be required; in many cases, at least two years of health or related work experience is also required. A candidate's total curriculum is developed with the approval of his program committee. All candidates must complete 30 or more semester hours, including courses PH 609-610 and PH 791. A final examination or other final requirement as determined by the student's academic adviser must be completed before graduation. In some cases degree requirements may involve up to two years of residence (Refer to *School of Public Health Bulletin*.)

### Master of Science Degree

The M.S. program is intended to provide preparation for individuals who require more concentrated work in a specific area of emphasis. The program may require up to 24 months; both Plan A and B are available. In Plan A the minimum course requirement is at least 30 semester hours, including PH 609-610 and 6 credits for thesis research. A final oral examination on the thesis and related subjects is required. In Plan B, 30 or more semester hours, including PH 609-610 and PH 791, are required; a final examination or other final requirement as determined by the student's academic adviser must be completed before graduation. (Refer to *School of Public Health Bulletin*.)

Courses are to be selected from those listed below, and, with approval, others in the related fields suitable for each individual student.

### PUBLIC HEALTH (PH)

- 601 Medical Care Systems (3)  
 602 Supervision and Leadership in Health Services (1)  
 603 Legal Basis for Health Services (1)  
 604 Principles of Organization of Health Services (2)  
 605 Personnel Practices in Health Services (2)  
 606 Economics of Health Service (3)  
 607 Seminar in Health Services Administration (1)  
 609-610 Public Health Organization and Administration (3-3)  
 611 Information Systems and Planning (3)  
 612 Ecological Concepts and Planning (3)  
 613 Seminar in Comprehensive Health Planning (3)  
 614 Political Aspects of Policy Planning (3)  
 616 Basic Concepts of International Health (3)  
 617 Comparative Public Health Systems (3)  
 618 Seminar in International Health (2)  
 624 Community Mental Health (2)  
 629 Dental Public Health (2)  
 631-632 Public Health Nutrition (2-2)  
 633 Seminar in Public Health Nutrition (2)  
 634 Nutrition Problems and Applied Programs (2)  
 642 Maternal and Child Health I (2)  
 643 Maternal and Child Health II (2)  
 644 The Handicapped Child (2)  
 645 Principles of Comprehensive Maternity Care (2)  
 646 Health Services for the Mentally Retarded (2)  
 649 Family Planning in Theory and Practice (2)  
 650 Demography and World Population Problems (2)  
 651 Fertility and Reproduction (2)  
 652 Components of Population Control (2)

- 654 Vital and Health Statistics (3)  
 655 Biostatistics I (3)  
 656 Biostatistics II (3)  
 658 Seminar in Biostatistics (1)  
 663 Principles of Epidemiology (2 or 3)  
 665 Epidemiological Management of Chronic Diseases (2)  
 666 Epidemiology of Infectious Diseases in the Pacific Area (3)  
 667 Laboratory Aspects of Infectious Diseases in the Pacific Area (2)  
 670 Socio-Cultural Aspects of Health and Illness (3)  
 673 Educational Approach to Public Health (2)  
 674 Community Health Education Laboratory I (2)  
 675 Group Methods in Public Health (2)  
 676 Health Information Processes in Public Health—Theory and Practice (2)  
 677 Educational Program Evaluation in Public Health (2)  
 678 In-Service Training and Staff Development in Public Health (2)  
 681 Environmental Health (2)  
 682 Vector Control in Environmental Health (3)  
 683 Occupational Health I (2)  
 685-686 Solid Waste Management and Control (3-3)  
 687 Sampling and Analysis of Solid Wastes (4)  
 688 Design of Solid Waste Disposal Facilities (4)  
 695 Community Health Problems (1)  
 697 Gerontology (3)  
 700 Management of Health Services (3)  
 701 Seminar in Medical Care Organization (2)  
 702 Principles of Fiscal Management for Health Services (2)  
 703 Planning and Evaluation of Health Services (3)  
 704 Institutional Health Care Facilities (3)  
 705 Non-Institutional Health Care Facilities (2)  
 706 Case Studies in Health Service Administration (2)  
 736 Seminar on Health of the School-Age Child (2)  
 746 Techniques in Demographic Analysis (2)  
 747 Statistical Methods in Epidemiological Research (3)  
 763 Advanced Community Health Education (2)  
 764 Advanced Community Health Education Laboratory II (2)  
 765 Advanced Seminar in Special Public Health Education Problems (2)  
 771 Environmental Control of Disease Through Food Protection (2)  
 772 Environmental Factors in Health Problems (3)  
 773 Measurement of Environmental Factors (3)  
 786 Community Health Concepts and Methods (1)  
 791 Advanced Public Health Practice in (Area of Emphasis) (3)  
 792 Seminar in Public Health (1-5)  
 799 Directed Reading/ Research (v.)  
 800 Thesis Research (v.)



successful academic performance in the areas of societal and psychological foundations of education, evaluation, and teaching principles and practices and, in addition, credit for supervised student teaching or teaching experience.

Admission to candidacy is based upon (1) the quality of the student's undergraduate record; (2) his performance on the general examination.

Both Plan A (thesis) and Plan B (nonthesis) are available.

**Plan A:** The program requires a minimum of 24 semester credits of course work, with a minimum of 14 semester credits in education and a maximum of 10 semester credits in a related field and 6 hours in a thesis. At least one graduate seminar is required. Required courses are Ed CI 635 or 636, 640\*; Ed EP 608, one of Ed EF 650, 651, 660 or 683, and Ed CI 800.

**Plan B:** The program requires a minimum of 30 semester credits in course work, with a minimum of 15 hours in education and a minimum of 12 hours in a related field. The program is primarily designed to enable teachers to strengthen their teaching field majors. At least one graduate seminar is required. Required courses are Ed CI 635 or 636, 640\*, 733 and one in educational foundations (recommended: Ed EF 650, 651, 660, 683).

87

## Secondary Education

### Graduate Faculty

- R.S. Alm, Ph.D. (Chairman)—English education, reading  
 M.C. Austin, Ed.D.—reading  
 F.B. Brown, Ed.D.—secondary education, curriculum  
 E.F. Chui, Ph.D.—health and physical education  
 J.N. Fultz, Ed.D.—social studies education  
 A.W.S. In, Ph.D.—secondary education  
 J.R. Little, Ph.D.—health and physical education  
 R.M. Martin, Ph.D.—secondary education, supervision, curriculum  
 J.D. Morris, Ed.D.—business education  
 T. Nelson, Ed.D.—secondary education, supervision, curriculum  
 D.S. Noda, Ph.D.—secondary education, supervision, curriculum  
 A.J. Picard, Ph.D.—mathematics education  
 A.L. Pickens, Ed.D.—art education  
 M.F. Poyzer, Ed.D.—industrial education  
 D.H. Thompson, Ed.D.—health and physical education  
 N. Whitman, Ph.D.—mathematics education  
 L.F.H. Zane, Ph.D.—trades and industries education

### CURRICULUM AND INSTRUCTION (Ed CI)

- 437 Curriculum Development, Industrial Education (2)  
 460 Distributive Education (3)  
 471 Special Problems in Home Economics Education (2)  
 634 Extraclass Activities in Secondary Schools (2)  
 635 Junior High School Curriculum (3)  
 636 Secondary School Curriculum (3)  
 637 Art in Secondary Education (3)  
 639 The Business Education Curriculum (3)  
 640 Seminar in Teaching Fields (3)  
 643 Public School Curriculum for Physical Education (3)  
 646 Reading Difficulties (3)  
 647 Clinical Procedures in Reading (3)  
 657 Community College (3)  
 699 Directed Reading and/or Research (v.)  
 733 Seminar in Curriculum, Secondary (3)  
 737 Foundations in Art Education (3)

\*Required if "related field of study" in M.Ed. program is a commonly taught subject in public schools.

Intended candidates for the M.Ed. must present suc-



## Social Work

### Graduate Faculty

H.H. Aptekar, D.S.W. (Dean)  
 J. Fischer, D.S.W.—human behavior  
 R. Fisher, M.S.S.A.—group work  
 N.M. Hartman, M.A.—casework, research  
 J. Krisberg, M.A.S.A.—practicum  
 K. Kumabe, M.S.W.—casework, research  
 O. Kurren, Ph.D.—community organization  
 L. Lister, D.S.W.—human behavior  
 F. Merritt, D.S.W.—social work practice, research  
 B. Polemis, Ph.D.—research  
 M. Sikkema, Ph.D.—social welfare policy and services, research  
 R. Takasaki, M.P.A.—administration  
 W.A. Walsh, Ph.D.—casework

The School of Social Work offers an accredited two-year M.S.W. program. Inquiries for information and applications for admission should be sent to the office of the School of Social Work. The school publishes an annual bulletin.

The curriculum for the master of social work requires the student to complete a minimum of 52 credits of work including at least 6 credits (600 clock hours) in supervised field work and 6 credits covering research on a group project or individual thesis. The core curriculum, aside from the research sequence, covers three areas: social policy and social services, human behavior and the social environment, and social work practice. The courses in these areas are set up as sequences which continue throughout the two years. The student's program usually includes the following courses:

### Social Services

#### SOCIAL WORK (SW)

- 627-628 Policies and Services in World Social Welfare (2-2)  
 655-656 Selected Topics in Social Welfare (3-3)  
 753 The Law in Social Welfare and Social Work (2)  
 755-756 Advanced Seminar in Substantive Fields of Social Welfare (3-3)  
 777-778 Planning, Policy-Making and Administration in Social Welfare (2-2)

### Human Behavior in the Social Environment

- 610-611 Human Development and Behavior in Cross-Cultural Perspective (2-2)  
 774-775 Studies in Individual and Social Behavior (3-3)  
 776 Social Work and Social Psychiatry (3)

### Social Work Practice

(All methods courses require concurrent field practice)

- 603-604 General Social Work Practice (3-3)  
 605-606 Social Work Practice with Individuals & Groups (3-3)  
 607-608 Social Work Practice in Community Organization (3-3)  
 620-621 Integration Seminar (1-1)  
 626 Prevention and Treatment of Juvenile Delinquency (2)  
 660-661 Practicum (3-3)  
 703-704 General Social Work Practice (2-2)  
 720-721 Integration Seminar (1-1)  
 760-761 Practicum (3-3)  
 764 The Social Caseworker and the Use of Group in Treatment (2)  
 765 Advanced Social Casework (2)  
 766 Seminar in Social Casework (2)

- 767 Casework with Children (2)  
 770 Advanced Social Group Work (2)  
 771 Seminar in Social Group Work (2)  
 781-782 Seminar in Community Organization Process (2-2)  
 785 Methods of Supervision in Social Work (2)  
 796-797 Directed Individual Study in Substantive Field (3-3)

### Research

- 651 Introduction to Scientific Method and Research Principles in Social Work (2)  
 652 Research Methodology in Social Welfare and Social Work (2)  
 794-795 Group Research Project (3-3)  
 800 Thesis Research (3)

## Sociology

### Graduate Faculty

E. Babbie, Ph.D.—methodology, sociology of religion  
 H.V. Ball, Ph.D.—sociology of law, race relations  
 H.R. Barringer, Ph.D.—comparative sociology, logic of social inquiry  
 M. Bloombaum, Ph.D.—methodological integration, social interaction  
 D.B. Chandler, Ph.D.—family, theory  
 C.K. Cheng, Ph.D.—social institutions, family  
 L.J. Cho, Ph.D.—demography  
 L. Freeman, Ph.D.—mathematical sociology, general theory  
 B.L. Hormann, Ph.D.—changing folk and peasant societies, sociology of religion  
 G.G. Kassebaum, Ph.D.—criminology, comparative research  
 J.A. Palmore, Ph.D.—demography, methodology  
 R.E. Sakumoto, Ph.D.—urban sociology, social deviancy  
 P.G. Steinhoff, Ph.D.—Japanese society, sociology of law  
 D. Swift, Ph.D.—sociology of education, formal organizations  
 M.G. Weinstein, Ph.D.—sociology of education, sociology of communities  
 G. Won, Ph.D.—industrial sociology, urban sociology  
 G.K. Yamamoto, M.A.—occupations and professions, comparative institutions—Japan  
 D.S. Yamamura, Ph.D.—ecology and demography, methodology

Two programs of graduate study in sociology are offered: a Ph.D. program that is intended to provide the broadest scholarly basis for research and university teaching, and a M.A. program in applied sociology that affords particular relevance to one or more lines of professional work other than university scholarship. Applicants for graduate study in the department are required to specify which program they wish to enter.

### Ph.D.

The Ph.D. program represents an attempt to provide a flexible, professionally oriented and student-centered curriculum. Its goal is the facilitation of interaction among and between students and faculty in a setting that will enhance the opportunity for all to play professional roles.

Beginning graduate students will fulfill all requirements for their first year of study by producing a research paper that shows promise of professional quality work. It is intended that this paper be prepared on a subject and in a style that is chosen by the student with the advice of a committee consisting of two mem-

bers of the graduate faculty (one of whom may be outside sociology) and one or more advanced graduate students. It may be prepared and submitted at any time after the end of the first academic term and before the end of the second academic term of the student's residence. When this paper is submitted it is reviewed by the committee and all other interested students and faculty members. Their review will serve as a guide for the student's further work.

After completion of the first paper and its review process each student must establish a new committee consisting of three members of the graduate faculty (two of whom may be outside sociology). With the help of this committee, the student must prepare a second, professional quality paper. This paper may be presented at any time between the end of the first term and the end of the third term following successful completion of the preliminary paper. This paper, like the earlier one, may mobilize any style of sociological work and cover any substantive area agreeable to a student and his committee. The student's three committee members will report to the departmental graduate committee, which will be responsible for certifying successful completion of the M.A. degree requirements to the Graduate Division when a minimum of 30 semester hours of course work and an acceptable paper have been completed.

After successful completion of the master's level paper, students will, upon recommendation of the graduate committee, be admitted to formal candidacy for the Ph.D. degree. Each student will be expected to pass an oral comprehensive examination, prepare a dissertation prospectus, a dissertation and an oral defense. Completion of these requirements to the satisfaction of the dissertation committee will result in the recommendation that a degree be awarded. For general requirements for the degree of doctor of philosophy see "Academic Information" section, this *Bulletin*.

Students who have completed some graduate work elsewhere may submit their earlier work in lieu of their first or second papers. In such cases, the usual committee reviews will be conducted in order to certify progress.

### M.A.

The M.A. program in applied sociology is designed to provide education in sociological methods and information of particular relevance to several areas of non-academic employment. This is a program for students who seek specific intellectual development to qualify them for a professional position or to upgrade a position already held. It is possible in this program to focus on the acquisition of the special skills needed to perform effectively as a sociologist in particular private or governmental agencies or organizations such as welfare agencies, corrections institutions, citizens groups, courts, mental hospitals, planning agencies and the like.

The following requirements must be met to receive the M.A. degree in applied sociology:

a) Each applicant must complete a specialized course

of studies designed by a faculty committee of the department with his particular needs and interests in mind.

b) Each student must complete 30 credit hours of course work, of which at least 18 are courses numbered 600 or above, in a manner acceptable to the student's committee.

c) The committee will evaluate the performance and accomplishments of the candidate by examination; a written thesis is not required.

Initially, the M.A. in applied sociology will permit concentration on any of the following special topics: Social Research Technology, Urban Planning, Population Studies, Deviance and Control, and Teaching of Sociology. Details may be obtained by inquiry to the department of sociology.

### SOCIOLOGY (Soc)

- 412 Analysis in Demography and Ecology (3)
- 422 Analysis in Social Organization and Change (3)
- 432 Analysis in Social Control (3)
- 442 Analysis in Social Psychology (3)
- 452 Analysis in Social Institutions (3)
- 462 Analysis in Applied Sociology (3)
- 472 Analysis in Sociology: Theory, Methods, Statistics (3)
- 497 Topics in Sociology: Faculty Projects Normally Limited to 10 students (v.)
- 498 Topics in Sociology: Student Projects (v.)
- 610 Methods and Statistics I (3)
- 611 Methods and Statistics II (3)
- 612 Classics of Sociological Theory (3)
- 613 Concepts and Propositions in Sociology (3)
- 714 Seminar in Methods of Research (3)
- 715 Seminar in Social Statistics (3)
- 716 Seminar in Theory Construction (3)
- 720 Seminar in Social Organization (3)
- 721 Seminar in Social Institutions (3)
- 722 Seminar in Group Relations (3)
- 730 Seminar in Social Disorganization (3)
- 731 Seminar in Social Change (3)
- 740 Seminar in Social Psychology (3)
- 741 Seminar in Culture and Communication (3)
- 750 Seminar in Demography and Human Ecology (3)
- 751 Seminar in Urban and Rural Sociology (3)
- 799 Directed Research (v.)
- 800 Thesis Research (v.)

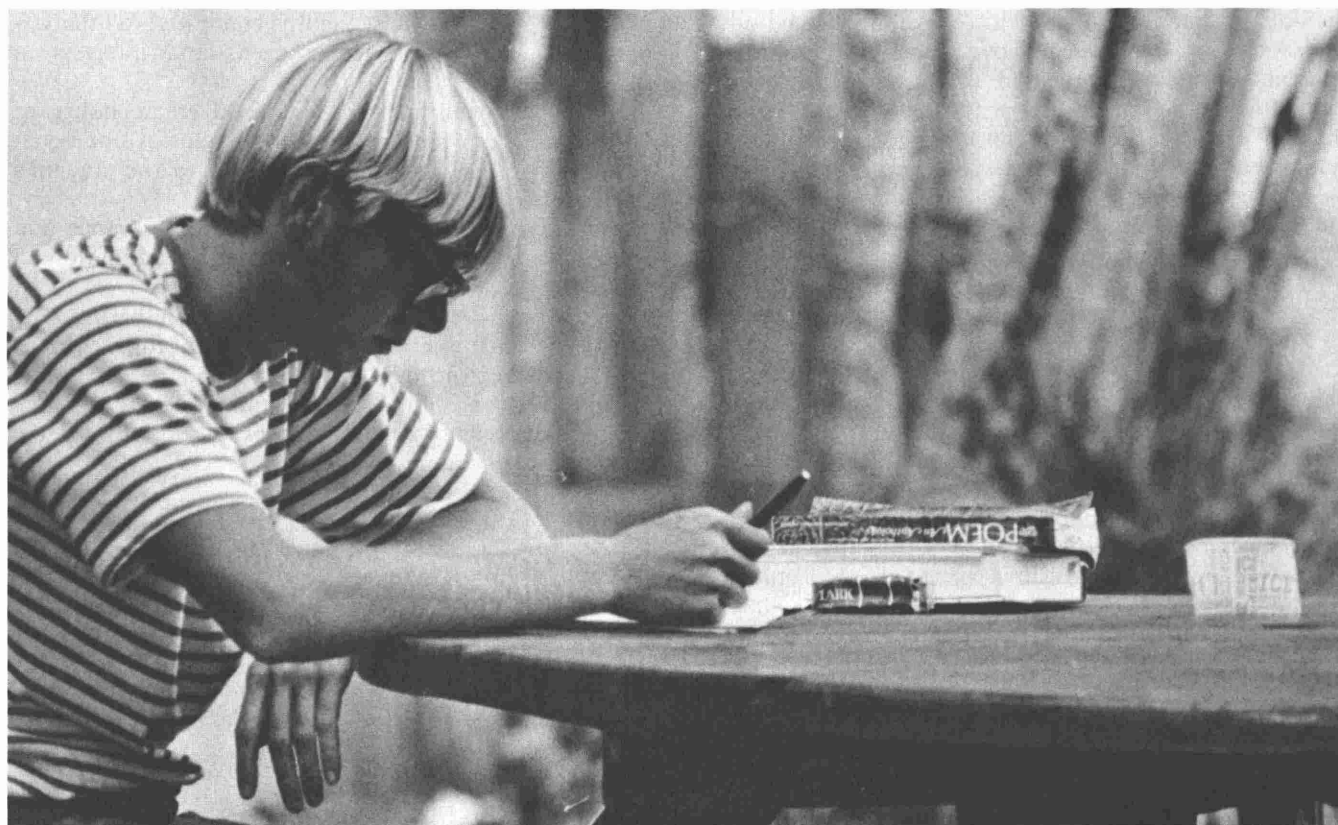
89

### Spanish

#### Graduate Faculty

- E.C. Knowlton, Jr., Ph.D. (Chairman)—history of the language, Hispano-Philippine literature
- S. Baciú, M.A.—Ibero-American literature, civilization, and history of ideas
- R.L. Hadlich, Ph.D.—comparative, structural and Romance linguistics
- J.S. Holton, Ph.D.—methods of teaching the language, grammar
- M. Montes, Ph.D.—Spanish literature, stylistics, and creative writing
- R. Moody, Ph.D.—applied Hispanic linguistics and Ibero-American literatures

Intended candidates for the M.A. in Spanish must present 24 semester hours of undergraduate credit in Spanish, excluding introductory and intermediate



courses, but including work in Spanish phonetics, peninsula literature, and Spanish American literature, or equivalent preparation. They must also demonstrate, by means of a personal interview or by a tape recording, that they possess an acceptable accent and a reasonable degree of fluency in Spanish.

Both Plan A and Plan B are available. Under both plans a minimum of 6 and a maximum of 15 credits may be taken from courses in related fields. Some knowledge of Latin is desirable, and one year of a second modern language will be required of those whose basic command of Spanish was largely acquired in the home. Before admission to candidacy a student must present satisfactory scores on the Proficiency Examinations for Teachers and Advanced Students prepared by M.L.A. and E.T.S. Required courses are marked with an asterisk; those numbered between 400 and 499 not taken as part of the undergraduate preparation must form part of the M.A. program. A minimum of 10-12 hours in Spanish literature courses is normally required of all candidates.

A final examination, written and oral, on relevant fields within Spanish must be successfully completed by all candidates.

#### SPANISH (Span)

- 403-404 Advanced Oral Practice (3-3)
- 405 Spanish-English Translation (3)
- \*431 Structure of Spanish (3)
- 441 History of the Spanish Language (3)
- 444 Spanish Dialectology (3)

- 465-466 Modern and Contemporary Spanish Literature (3-3)
- 470 Social and Political Ideas of 20th Century Latin America (3)
- 485-486 Spanish American Prose (3-3)
- 490 Hispano-Philippine Literature (2)
- \*625-626 Stylistics and Advanced Composition (3-3)
- 658 Seminar in Spanish Linguistics (3)
- 665 Spanish Literature Prior to the Golden Age (3)
- 670 Spanish Literature of the Golden Age (3)
- 674 Spanish-American Lyric Poetry (3)
- 681-682 Spanish-American Novel (3-3)
- 695 Seminar in Hispanic Literature (3)
- 699 Directed Research (v.)
- 800 Thesis Research (v.)

#### HISTORY (Hist)

- 473-474 History of Spain and Portugal (3-3)
- 487-488 History of Latin America (3-3)

#### LINGUISTICS (Ling)

- 320 General Linguistics (3)
- 410 Articulatory Phonetics (3)
- 421 Introduction to Phonological Analysis (3)
- 422 Introduction to Grammatical Analysis (3)

#### EUROPEAN LANGUAGES (EL)

- 610 Contrastive Analysis of Spanish and French with English (3)
- 621 Comparative Romance Linguistics (3)
- 630 Seminar in Research Methods (1)

#### CURRICULUM AND INSTRUCTION (Ed CI)

- 335 Foreign Languages, Secondary (3)
- 640 Seminar in Teaching Fields: Foreign Language (3)

#### ENGLISH (Eng)

- 735 Seminar in Comparative Literature (3)

## Speech—Communication

### Graduate Faculty

- H.W. Ellingsworth, Ph.D. (Chairman)—interpersonal communication, communication and innovation, history of research  
 E.J. Bilsborrow, Ph.D.—interpretation, public speaking, speech education, semantics  
 L.N. Breneman, M.A.—interpretation  
 B.H. Byers, Ed.D.—speech education  
 J.W. Bystrom, Ph.D.—history of research, communication systems  
 G. Dykstra, Ph.D.—language performance theory, first and second language development, theory and practice in learning programs  
 L.E. Ekroth, Ph.D.—intercultural communication, non-verbal communication, encounter groups  
 L.S. Harms, Ph.D.—intercultural speech-communication, communication systems  
 P.J. Heinberg, Ph.D.—speech-communication behavior modification, scientific methods  
 D.W. Klopff, Ph.D.—forensics, debate, small group communication  
 V.K. Larson, M.A.—speech education, speech improvement, choral speaking  
 R.L. Rider, Ph.D.—radio and television, international communications  
 S.E. Sanderson, Ph.D.—contemporary rhetoric, interpretation, international speech education  
 T.A. Welden, Ph.D.—interpersonal communication, speech education, philosophy of science  
 H.H. Wong, Ph.D.—phonology, linguistics

Intended candidates for the M.A. in speech-communication may present a bachelor's degree from a recognized university with a major in a field which involves the systematic study of human communication, including speech, communications, psychology, sociology, business administration, linguistics, education. The Aptitude Test of the Graduate Record Examination is required. Applicants whose backgrounds are deficient for the successful pursuit of the M.A. degree may be required to strengthen certain areas. Plan A (thesis) and Plan B (nonthesis) are available. Both programs require the completion of SpCom 601 and 602. A minimum of 6 and a maximum of 9 credit hours of graduate work must be taken in a related field outside the department. An oral examination is required near the end of the program. Under Plan A, the thesis will count 6 semester hours. At least 12 semester hours, excluding SpCom 602, must be in courses numbered above 600. Not more than 2 semester hours may be taken in directed research, SpCom 799. Under Plan B, at least 18 semester hours must be in courses numbered above 600.

### SPEECH-COMMUNICATION (SpCom)

- 304 Speech-Communication Characteristics of the Source (3)  
 305 Language in Speech-Communication Behavior (3)  
 384 Intercultural Communication (3)  
 406 Evaluation of Speech-Communication (3)  
 412 Phonetics and Phonemics of American English (3)  
 434 Advanced Interpretative Reading (3)  
 468 Broadcasting and the Public (3)  
 469 World Broadcasting (3)  
 499 Special Problems (v.)  
 601 History of Theory and Trends in Speech-Communication Research (3)  
 602 Methods of Scientific Research in Speech-Communication (3)  
 613 Experimentation in Language Acquisition and Modification (3)  
 631 Seminar in Interpretative Reading (3)  
 651 Seminar in Rhetoric and Public Address (3)  
 671 Speech-Communication in Control of Cognition (3)

- 672 Speech-Communication in the Control of Behavior (3)  
 681 Speech-Communication Process Analysis (3)  
 682 Speech-Communication: Theories of Source-Receiver Behavior (3)  
 696 General Seminar (3)  
 784 Seminar in Intercultural Speech-Communication (3)  
 785 Seminar in Speech-Communication in Innovation (3)  
 799 Research (v.)  
 800 Thesis Research (v.)

## Speech Pathology and Audiology

### Graduate Faculty

- M. Ansberry, Ph.D. (Chairman)—audiology  
 S. Batkin, M.D.—speech science  
 D.F. McPherson, Ph.D.—speech pathology, audiology  
 G. Pang-Ching, Ph.D.—audiology  
 J.R. Watson, M.D.—audiology, hearing science

Intended candidates for the M.S. degree in speech pathology and audiology must present a minimum of 30 undergraduate semester credits in the area including basic courses in speech correction, methodology, pathology of speech, audiology, testing of hearing, habilitation and rehabilitation of hearing, speech and hearing science, and practicum in both speech pathology and audiology. A minimum of 12 credits in psychology including courses in developmental psychology and psychology of adjustment is required.

A preliminary conference will be held with each beginning graduate student prior to his initial enrollment in courses. This will include a thorough analysis of his previous academic program and a determination of his qualifications of admission to candidacy or the necessity for removal of undergraduate deficiencies without graduate credit before such a recommendation is made. The student's adviser will determine when recommendation for admission to candidacy will be made. No general examination will be required.

Two programs are offered for graduate study: Plan A, thesis; and Plan B, nonthesis. The plan to be followed is determined by the student and his advisory committee. The decision is based upon specific interests of the student and his future educational and occupational objectives. These programs are so designed that the student who completes either should be able to meet the academic requirements for the certificate of clinical competence in both speech pathology and in audiology as established by the American Speech and Hearing Association. This presupposes a strong undergraduate major and preparation in the areas listed above. Under Plan A 36 semester credits in course work plus a thesis (8 credits) and a final oral examination on the thesis subject are required. Plan B requires satisfactory completion of 44 semester credits of course work including SPA 799 and a seminar appearance in which the student will be examined upon the research study which he has completed in this course. The minimum length of time required for completion of either program by a regular graduate student who is admitted with no undergraduate deficiencies is one academic year of full-time graduate study plus two 12-week summer terms or three semesters plus one six-week summer term.

## Specialized courses offered at the graduate level are:

## SPEECH PATHOLOGY AND AUDIOLOGY (SPA)

- 600 Research Methods (3)  
 602 Diagnostic Procedures in Speech Pathology (3)  
 603 Advanced Audiology (3)  
 610 Organic Disorders of Speech (3)  
 612 Functional Disorders of Speech (3)  
 613 Language Development for Children with Hearing Deficiencies (3)  
 710 Advanced Practicum in Speech Pathology (1-3)  
 711 Advanced Practicum in Audiology (1-3)  
 712 Advanced Practicum in Speech Pathology (6)  
 720 Seminar in Functional Disorders of Speech (3)  
 721 Seminar in Audiology—Diagnostic Procedures (3)  
 722 Seminar in Organic Disorders of Speech (3)  
 723 Seminar in Audiology—Rehabilitative Procedures (3)  
 799 Research (Required for Plan B Program)  
     Section 1: Speech Pathology (1-4)  
     Section 2: Audiology (1-4)  
 800 Thesis Research (Required for Plan A Program)  
     Section 1: Speech Pathology (8)  
     Section 2: Audiology (8)

## Zoology

## Graduate Faculty

- A.J. Berger, Ph.D. (Chairman)—ornithology, human and avian anatomy  
 J.M. Arnold, Ph.D.—developmental biology  
 J.H. Bailey, Ph.D.—invertebrate zoology  
 A.H. Banner, Ph.D.—invertebrate zoology, systematics  
 J.M. Branham, Ph.D.—experimental embryology  
 W.A. Gosline, Ph.D.—ichthyology, zoogeography and evolution  
 M.G. Hadfield, Ph.D.—developmental biology of invertebrates  
 S.R. Haley, Ph.D.—invertebrate embryology  
 P. Helfrich, Ph.D.—ichthyology, ecology  
 F.I. Kamemoto, Ph.D.—physiology, endocrinology  
 R.E. Kane, Ph.D.—cell biology  
 E.A. Kay, Ph.D.—malacology  
 G.S. Losey, Jr., Ph.D.—marine ecology, behavior  
 J.A. Maciolek, Ph.D.—limnology, fishery biology  
 A.N. Popper, Ph.D.—sensory processes of animal communication  
 S.A. Reed, Ph.D.—coral physiology  
 E.S. Reese, Ph.D.—behavior, ecology, invertebrate zoology  
 E.D. Stevens, Ph.D.—physiology  
 J.S. Stimson, Ph.D.—population ecology, marine ecology  
 A.L. Tester, Ph.D.—fishery biology, biometry  
 S.J. Townsley, Ph.D.—invertebrate zoology, ecology, radiobiology  
 P.B. van Weel, Ph.D.—physiology, physiological ecology

## Affiliate Faculty

- E.C. Evans, III, Ph.D.—cetacean sonar systems  
 G.W. Harvey, Ph.D.—cetacean sound production and reception; air-sea interface analysis  
 Y. Kondo, Ph.D.—malacology  
 K.S. Norris, Ph.D.—marine mammals  
 J.E. Randall, Ph.D.—ichthyology  
 Z.H. Shehadeh, Ph.D.—physiology of fishes  
 M. Takata, M.S.—fishery biology

Intended candidates for the M.S. or Ph.D. in zoology must present a minimum of 18 hours of undergraduate preparation in zoology, including courses in vertebrate zoology (including comparative anatomy), embryology, and physiology. M.S. and Ph.D. candidates should have completed two years of chemistry (inorganic and organic), and courses in calculus, botany, and one year of physics. Deficiencies in undergraduate preparation must be made up. An official record of the student's performance on the Graduate Record Examination (Aptitude Test and the Advanced Test in Biology) must be submitted to the chairman of the zoology department before any action will be taken on applications for admission.

Courses are listed below. One seminar or topics course each year is required. 702 and 800 are required only for Ph.D. candidates. For the M.S. under Plan A a maximum of 6 hours, and under Plan B a minimum of 6 hours, may be elected from related courses in botany, chemistry, entomology, genetics, mathematics, meteorology, oceanography, and physics. For the Ph.D., additional work will be stipulated by the supervising committee. Ph.D. candidates must pass a reading examination in one foreign language.

## ZOOLOGY (Zool)

- 416 Histology (3)  
 417 Microtechnique (3)  
 420 Embryology (3)  
 430 Animal Physiology (3)  
 435 Endocrinology (2)  
 441 History of Zoology (2)  
 450 Natural History of the Hawaiian Islands (2)  
 460 Avian Biology (3)  
 465 General Ichthyology (3)  
 470 Limnology (3)  
 480 Animal Evolution (2)  
 603 Zoogeography (2)  
 605 Comparative Endocrinology (4)  
 606 Animal Behavior (3)  
 608 Growth and Form (4)  
 609 Biology of Symbiosis (4)  
 610 Topics in Developmental Biology (v.)  
 611 Principles of Systematic Zoology (3)  
 620 Marine Ecology (3)  
 622 Isotopic Tracers in Biology (3)  
 631 Biometry (3)  
 632 Advanced Biometry (3)  
 646 Comparative Invertebrate Physiology (3)  
 666 Advanced Ichthyology (3)  
 691 Seminar in Zoology (1)  
 699 Directed Research (v.)  
 \*702 Preparation of Scientific Manuscripts (1)  
 714 Topics in Animal Behavior (v.)  
 715 Topics in Invertebrate Zoology (3)  
 716 Topics in Fish and Fisheries Biology (3)  
 718 Topics in Animal Physiology (3)  
 \*800 Thesis Research (v.)

# Index

- Academic information, 19
- Accreditation of the University, 8
- Admission requirements, 19
  - Deadlines, 19
  - Applications, 19
- Administrative officers, 6
- Admission Test for Graduate Study in Business, 20
- Advance tuition deposit, 12
- Agricultural economics, 33
- Agricultural engineering, 34
- Agronomy and soil science, 34
- American studies, 35
- Anatomy, 36
- Animal sciences, 37
- Anthropology, 37
- Aquarium, 12
- Applications, 19
  - Fees, 12
  - Forms, 19
  - Procedures, 19
- Arboretum, Lyon, 11
- Architecture, 38
- Art, 39
- Asian languages, 41
- Asian studies, 42
- Assistantships, 13
- Astronomy, 42
- Audiovisual Services, 10
  
- B-average rule, 21, 23
- Bachelor's certification, 21
- Biochemistry and biophysics, 43
- Botanical sciences, 44
- Business administration, 45
  
- Calendar, University, 2
- Certification of degree, 21
- Chemistry, 47
- Chinese, 41
- Civil engineering, 48
- Classics, 48
- Classification of students, 20
- Computer sciences, 69
- Computing Center, 8
- Conferring of degrees, 23
- Correspondence course credits, 22
- Counseling and Testing Center, 15
- Course change fee, 13
- Course changes, 21
- Course loads, 21
- Course numbers, 22
- Credit by examination, 22
- Credit-no credit option, 22
- Credits, 22
  - Graduate credit for seniors, 21
  - Correspondence courses, 22
  - Transfer of, 24
  
- Deficiencies, undergraduate, 22
- Degrees, 23
  - Certification, 21
  - Checks, 23
  - Conferring of, 23
  - Doctor of philosophy, 28
  - Master's degrees, 24-27
    - Plan A, 25
    - Plan B, 26
    - Plan C, 27
  - (See also subject listings)
  
- Denial of registration, 21
- Diplomas, 23
- Dispensary, 14
- Doctor of philosophy, 28
  - Residence, 28
  - Credits, 28
  - Language requirements, 28
  - Doctoral committee, 29
  - Examinations, 29
  - Dissertation, 29
  - Summary of procedure, 30
- Dormitories, 14
- Drama and theatre, 49
  
- East-West Center, 16
- Economic Research Center, 9
- Economics, 50
- Education Research and Development Center, 9
- Educational administration, 51
- Educational Broadcasting Division, 9
- Educational communications, 52
- Educational foundations, 53
- Educational psychology, 53
- Electrical engineering, 54
- Elementary education, 56
- English, 56
- English as a second language, 57
- English Language Institute, 15
- Entomology, 58
- Entrance examinations, 20
- Environmental Center, 9
- Examination, credit by, 22
- Examinations, 20, 22
- Expenses, student, 14
  - (See also Tuition and fees)
  
- Fellowships and assistantships, 13
- Fees, 12
  - Advance tuition deposit, 12
  - Application fee, 12
  - Graduation fee, 12
  - Late registration, 12
  - Thesis binding fee, 12
  - Refunds, 13
  - Course change fee, 13



INDEX

Financial aids, 13  
Food science, 60  
Food services, 14  
Foreign student applications, 19  
French, 60

Gateway House, 14  
General examination, 20  
General fee, 12  
General information, 7  
Genetics, 61  
Geodesy, 65  
Geography, 62  
Geology and Geophysics, 64  
Geophysics, Hawaii Institute of, 9  
German, 66  
Government (*See* Political science)  
Grade reports, 22  
Grades, grade-point ratios, 22  
Graduate assistantships, 13  
Graduate credit for seniors, 21  
Graduate Division staff, 6  
Graduate Record Examination, 20  
Graduation fee, 12  
Greek, 48

Hamilton Library, 10  
Hawaii Cooperative Fishery Unit, 9  
Hawaii Institute of Geophysics, 9  
Hawaii Institute of Marine Biology, 9  
Health requirements, 14  
History, 66  
History of the University, 7  
Horticulture, 68  
Housing, student, 14  
Hydrology, 65

Incomplete grades, 22  
Industrial Relations Center, 9  
Information sciences, 69  
Inquiries, 8  
Institute for Astronomy, 9  
Instructional Resources Service Center, 10  
International programs, 12  
International Student Office, 15

Japanese, 41

Labor-Management Education Center, 8  
Laboratory of Sensory Sciences, 10  
Land Study Bureau, 10  
Late registration, 21  
Latin, 48  
Legislative Reference Bureau, 10  
Libraries, 10  
Library studies, 70  
Linguistics, 70  
Listening Center, 11  
Living accommodations and expenses, 14  
    Gateway House, 14  
    Off-campus housing, 14  
    Food services, 14  
    Expenses, 14  
Loan funds, 13  
Lyon Arboretum, 11

Master's degrees, 24-27  
    (*See also alphabetical listings of departments*)  
Master's examination program, 27

Master's nonthesis program, 26  
    Credit-hour requirements, 26  
    Examinations, 26  
    Summary of procedure, 27  
Master's thesis program, 25  
    Credit-hour requirements, 25  
    Thesis requirements, 25  
    Examinations, 25  
    Summary of procedure, 26  
Mathematics, 72  
Mechanical engineering, 73  
Media specialists training (*See* Educational communications)  
Meteorology, 74  
Microbiology, 74  
Miller Analogies Test, 20  
Music, 75

Nursing, 76  
Nutritional sciences, 77

Ocean engineering, 77  
Oceanography, 78  
Off-campus housing, 14  
Out-of-state tuition and fees, 12  
Overseas Career Program, 79

Pacific and Asian Linguistics Institute, 11  
Pacific Biomedical Research Center, 11  
Pacific islands studies, 80  
Pacific urban studies, 11, 80  
Parking and traffic, 15  
Pass-fail option (*See* Credit-no credit)  
Peace Corps, 10  
Pharmacology, 81  
Philosophy, 81  
Physics, 82  
Physiology, 83  
Plan A, 25  
Plan B, 26  
Plan C, 27  
Plant pathology (*See* Botanical sciences)  
Political science, 83  
Population Genetics Laboratory, 11  
Population studies program, 84  
Press, University of Hawaii, 11  
Probation, academic, 23  
Probational students, definition of, 20  
Progress report forms, 24  
Psychology, 84  
Public health, 86

Refunds, 13  
Registration, 21  
    Late, 21  
    Change in, 21  
    Denial of, 22  
    Requirements for continued, 23  
Regular students, definition of, 20  
Requirements for continued registration, 23  
Research and service operations, 8  
Research assistantships, 13

Residence information form, 19  
Residence requirements  
  Doctoral, 28  
  Master's, 24  
Responsibility, student, 23  
Rights and freedoms of foreign students, 15  
Rules and requirements, M.A., 24

Scholarships and grants, EWC, 18  
Secondary education, 87  
Sinclair Library, 10  
Social Science Research Institute, 11  
Social security numbers, 21  
Social Welfare Development Center, 11  
Social work, 88  
Sociology, 88  
Soil science, 34  
Solid earth geophysics, 65  
Spanish, 89  
Special students, definition of, 20  
Speech and Hearing Clinic, 11  
Speech-communication, 91  
Speech Communication Center, 11  
Speech pathology and audiology, 91  
Student classifications, 20  
Student employment, 14  
Student Health Service, 14  
Summer Session, 20  
Survey Research Office, 11

Teaching English as a second language, 58  
Test of English as a Foreign Language, 20, 58  
Testing Center, 17  
Tests for admission, 20  
Thesis requirements, 25  
Time limitations for advanced degrees,  
  Master's, 24  
Transcripts, 19, 23  
Transfer of credits, 24  
Tuition, 12  
  Regular students, 12  
  Part-time students, 12  
  Out-of-state students, 12

Unclassified students, definition of, 21  
University calendar, 2  
University of Hawaii Press, 11  
University Relations Office, 12  
Urban studies program, 11

Variable credit courses, 21

Waikiki Aquarium, 12  
Water Resources Research Center, 12  
Withdrawals, 21

Zoology, 92



University of Hawaii  
Honolulu, Hawaii 96822