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○ Academic dates of significance.
□ Holidays and Recesses.

**UNIVERSITY OF HAWAII BULLETIN**

**VOLUME XLVIII**

June 1969 **Number 4**

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### 1969-70 UNIVERSITY CALENDAR

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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

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Richard H. Kosaki, B.A., M.A., Ph.D., Vice-President for Community Colleges
Richard L. Balch, A.B., Vice-President for Continuing Education and Community Service
Harold M. Bitner, B.S., M.A., Ph.D., Vice-President for Student Affairs
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General Information

The University of Hawaii, the state-supported system of public 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. The physical characteristics of Hawaii have focused interest on natural phenomena in geophysics such as tsunami research, volcanology, astronomy and astrophysics. Hawaii's multi-racial 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 inter-race relations.

The University offers course work leading to the bachelor's degree in 64 fields. The Graduate Division offers work leading toward the master's degree in 64 fields and the doctorate in 28.

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 campus at Hilo and there are three community college campuses on Oahu, one on Maui, and another on 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 largest Peace Corps training program in the nation and its facilities are located on the islands of Hawaii and Molokai. 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.

The University accepted a new task in 1964 when the state legislature authorized it 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 September, 1968. A college transfer program was initiated at the Maui campus in 1967. The community colleges ultimately will offer a variety of college transfer and general education curricula on all campuses.

Colleges and Schools. The academic work of the University is administered by the following units: the colleges of Arts and Sciences, Business Administration, Education, Engineering, Health Sciences and Social Welfare, and Tropical Agriculture and the Division of Continuing Education. Included in the College of Tropical Agriculture are the Cooperative Extension Service and the Hawaii Agricultural Experiment Station. The School of Tourist 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 and School of Social Work. The School of Library Studies is an additional professional school.

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. He is assisted by five vice-presidents in the areas of academic affairs, business affairs, community colleges, continuing education and community service, and student affairs. The president's staff also includes the secretary of the University, assistants to the president, and the director of University relations and development.

The council of deans 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 popular campus symbol, and the University teams traditionally are nicknamed "The Rainbows." The University seal contains a torch and book titled Mala-malama (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 language 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. Undergraduates: Office of Admissions and Records, Bachman Hall 125, 2444 Dole Street, Honolulu, Hawaii 96822. Graduate students: Graduate Division Student Services Office, 2540 Maile Way, Honolulu, Hawaii 96822.

General studies: Division of Continuing Education, 2500 Dole Street, Honolulu, Hawaii 96822. Summer session: Dean of Summer Session, Room 101, 2500 Dole Street, Honolulu, Hawaii 96822. Hilo campus: Provost, Hilo Campus, University of Hawaii, Hilo, Hawaii 96720. Community colleges: Registrar, Honolulu Community College, 874 Dillingham Boulevard, Honolulu, Hawaii 96817; Registrar, Kapiolani Community College, 620 Pensacola Street, Honolulu, Hawaii 96814; Registrar, Leeward Oahu Community College, 96-050 Farrington Highway, Pearl City, Hawaii 96782; Registrar, Kauai Community College, RR 1, Box 216, Lihue, Kauai, Hawaii 96766; Maui Community College, 810 Kaahumanu Avenue, Kahului, Maui, Hawaii 96732.
GENERAL INFORMATION

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 Cooperative Extension Service and the Hawaii Agricultural Experiment Station are discussed under the College of Tropical Agriculture; the Center for Engineering Research is discussed under the College of Engineering in the General Catalog.

The primary function of the Economic Research Center is to promote an understanding of the economy of the state of Hawaii. The center evaluates economic effects of legislation and performs basic and applied economic research relating to 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 instructional and administrative problems. Activities are directed at obtaining factual evidence that may assist educators in reaching decisions about 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 Television Broadcasting Service serves as the production and transmission agency for the Hawaii Educational Television Network, a cooperative service of the University and the State Department of Education. The ETV studios located on campus also serve as laboratories for students enrolled in speech and education communications courses and as a production center for closed-circuit television courses within the University.

The Thomas Hale Hamilton Library, located on the Mall, houses the main book and periodical collections of the University of Hawaii Library. Completed in mid-1968, its four stories provide space for approximately 800,000 volumes and 955 readers. It houses all research collections except the Government Documents Collection and the Hawaiian and Pacific Collection, which will remain in Sinclair Library until phase II of the Hamilton Library is completed. Collections are arranged in openstack fashion for maximum ease of access. They number approximately 554,000 volumes.
Gregg M. Sinclair Library, located at University Avenue and Campus Road, houses the Undergraduate Collection (60,000 volumes) in addition to its two research collections noted above and the East-West Center Library's Oriental Collection. Sinclair Library is in process of being converted to an undergraduate library. This includes expansion of the seating capacity, development of book collections related to the undergraduate curriculum, and creation of browsing and listening areas.

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

The selection, location, production, evaluation and effective use of media is coordinated for faculty and staff by the Center which has three major sections. Instructional Systems operates the closed circuit television system, eleven multi-media auditoria and Varsity Theatre. Graphics prepares and develops a wide range of graphic materials including charts and transparencies. The Media Lab is used for demonstrations and media workshops.

Audiovisual Services in Kuykendall 106 lends AV equipment, films, and does tape duplications.

The Harold L. Lyon Arboretum occupies 123 acres in upper Manoa Valley, about 4 miles from the Manoa campus. It was developed by the Hawaiian Sugar Planters' Association and presented to the University in 1957. Several hundred species of exotic trees and shrubs are established, inventoried and well maintained, providing the University and the scientific community with an unrivaled facility for research on living tropical and subtropical plants.

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, meteorology, oceanography, solid earth geophysics, geology, soils and geochemistry. The main laboratory of the institute is located at 2525 Correa Road on the campus. The institute also maintains a cloud physics observatory at Hilo, Hawaii, a ship operations facility at Pier 18, Honolulu, and a seismographic observatory in upper Manoa Valley.

The Hawaii Institute of Marine Biology, established in 1950, 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 labor-management relations problems, techniques and policies. It serves labor, management and the community by providing information on personnel and industrial relations. The center maintains a library containing the basic information services, as well as current publications; provides reference service; and assists in conducting conferences, lectures and group discussions, and in 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 Labor-Management Education Program, instituted in 1965, is under the general supervision of the Industrial Relations Center, College of Business Administration. 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 week-end institutes, conferences and staff training programs.

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 whom certain of its staff share appointments, the institute provides graduate training on the Manoa campus and at its observing facilities. The institute maintains observatories on Mount Haleakala, Maui, for studies of the sun (especially the corona), the zodiacal light
and the airglow. On Mauna Kea, Hawaii, it has under construction an 88-inch reflecting telescope and a coude spectrograph. This telescope is to be used for planetary and stellar studies. In its Manoa campus headquarters the institute has extensive facilities for data reduction and analysis and for instrument development.

The Institutional Research Office is responsible for conducting and coordinating research relating to the University of Hawaii. An advisory committee aids in selecting institutional studies which are necessary for the University to function effectively and to plan realistically for the future. The office also develops and analyzes data on students, faculty and academic programs.

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 both at the University and for the state of Hawaii. Through its interdisciplinary research program, the bureau assembles, coordinates and interprets data on the characteristics and utilization of land and develops additional information as needed to integrate economic and physical data to achieve the highest and best use of the lands of Hawaii. The bureau provides the governor, the legislature, state departments and other public agencies, and private organizations and individuals with data and impartial advice on land use. Recently, the bureau has taken on the new role of advising and participating in the technological and economic development of other areas throughout the Pacific.

The Legislative Reference Bureau, created by the legislature in 1943 to aid in legislative and governmental problems, is situated on the campus, 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. During sessions of the legislature the bureau maintains an office at the state capitol.

The Pacific and Asian Linguistics Institute plans and conducts research in general linguistic theory and specific problems of lexicology, structural semantics and grammatical description. Through its Pacific Lexicography Center, the research institute collects and stores data on the languages of the Pacific and adjacent areas, developing and utilizing computer techniques for storage and retrieval.
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 effort directed at developing (1) alternative approaches to solving pressing regional and urban problems and (2) individual and group capability to analyze complex community problems and formulate and evaluate major new policies. The program is located in the College of Arts and Sciences and is directed by the concerned academic departments and professional schools. The program sponsors and facilitates problem-oriented research on urban and planning problems, particularly those relevant to Hawaii, the Pacific Basin and Asia; assists participating academic departments and professional schools in offering graduate programs of studies with an emphasis on urban and regional problems and planning processes and participates in, coordinates with, and supports related University endeavors concerned with urban and regional development and planning problems.

The Population Genetics Laboratory was established in 1968 to conduct research in human genetics, especially on peoples of the Pacific Basin. Laboratory equipment includes a CDC 3100 computer used also by visiting investigators from other institutions.

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 the study of modernization, socio-economic development and cultural change. The institute is developing new programs in survey research, contemporary Korea, and Hawaii's people. A long-term study of culture and mental health in Asia and the Pacific will provide an opportunity for Asian and American scholars to participate in cooperative research.

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. The department of speech-communication conducts the evaluation program for the University. Students may be referred by their instructors for evaluation at any time. 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 Statistical and Computing Center operates an IBM 7040-1401 system and an IBM 360/50 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.

The University of Hawaii Press publishes scholarly books and monographs, particularly those dealing with Hawaii, the Pacific and the Orient; regional books; and three scholarly journals, Pacific Science, Philosophy East and West and Oceanic Linguistics.

The Press is a member of the Association of American University Presses and the American Book Publishers Council. It was established in 1947 as a division of the University operating with the guidance of an advisory committee of seven members, drawn from the administration and faculty and appointed by the president. Book manuscripts should be sent to the director, journal papers to the respective editors-in-chief.

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, established in 1964, plans and conducts research of both basic and practical nature related to Hawaii's water resources, and provides for the training of engineers and scientists through such 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 promotes interdisciplinary programs in water resources research among various units of the University.
GENERAL INFORMATION

The Youth Development Center, operated by the School of Social Work, is involved in social welfare planning efforts, particularly in the fields of juvenile delinquency and youth development. It offers consultation and training to agency and interagency programs through workshops, seminars, special University courses and other projects.

INTERNATIONAL TRAINING

The office of the vice-president for continuing education and community service provides general administrative and program direction and guidance to the University’s training centers; coordinates all business, administrative and training aspects of the University's contracts with the Peace Corps and the Agency for International Development; assists in devising and developing plans for new training programs; promotes and encourages the most effective use of the University's resources on international activities; provides on-campus assistance to foreign visitors as needed, particularly those engaged in related international programs.

The training centers of the University of Hawaii include two Peace Corps centers, one located on the island of Hawaii and the other on the island of Molokai, to prepare trainees for service in the following East Asian and Pacific countries: Fiji, Tonga, Western Samoa, Korea, Malaysia, Philippines and Thailand. The Asia Training Center, located on the island of Oahu, trains A.I.D. personnel for assignments in Vietnam, Laos and other countries of Southeast Asia.

COOPERATING INSTITUTIONS

Through cooperative agreements with institutions listed below, the University has increased its research facilities and expanded its services to the state. The Bishop Museum, the Pacific and Asian Affairs Council, and the Academy of Arts offer student membership rates.

The Bernice P. Bishop Museum, a world-famous storehouse of information, contains an outstanding reference library as well as important biological and anthropological collections relating to Hawaii and other Pacific islands. In addition, this institution holds the combined herbaria of the University and the museum, the most complete collection of Hawaiian plants in existence. The museum's research facilities are available to University students on a reciprocal basis.

The Fruit Fly Laboratory is maintained on the campus by the U. S. Department of Agriculture, Entomology Research Division, for the study of fruit fly pests. This division also cooperates with the University in the
use of a multi-purpose radiation facility, installed on campus in 1965 to study the disinfestation of agricultural produce.

The Hawaiian Sugar Planters' Association provided the funds for a building on the campus to house the Agricultural Engineering Institute, with shop facilities for instruction and research.

The Honolulu Academy of Arts has important collections of both Occidental and Oriental art. Installations of the permanent collection are augmented by a diversified schedule of temporary exhibitions including historical and temporary material from world-wide sources and a research library for Academy members, scholars and students.

The Pacific and Asian Affairs Council sponsors lectures, seminars and meetings on international affairs, particularly on Asia and the Pacific. Its library offers research materials on world affairs.

The Pineapple Research Institute of Hawaii, supported by the pineapple industry, is affiliated with the University. Offices and laboratories are located on a 150-acre experimental farm near Wahiawa, Oahu.

The Biological Laboratory, Honolulu, of the U.S. Bureau of Commercial Fisheries is located adjacent to the campus. Several of its senior staff members hold appointments on the Affiliate Graduate Faculty. The laboratory's mission is to conduct research on the oceanography and the fishery resources of the central Pacific Ocean. Its library, a comprehensive collection of works in the marine sciences, is available for use by students and faculty of the University. Requests for information should be addressed to the Director, Bureau of Commercial Fisheries, P. O. Box 3830, Honolulu, Hawaii 96812.

The universities of Michigan and Hawaii jointly use astronomical observatory facilities on the summit of Haleakala, island of Maui.

The U.S. Geological Survey Volcano Observatory, located at Kilauea Crater on the island of Hawaii, conducts research relating to the Hawaiian volcanoes. Research facilities are made available on occasion to faculty and students of the University.

The Organization for Tropical Studies, Inc., is a consortium of universities (currently with 21 member institutions including the University of Hawaii) established to increase understanding of tropical environments and to provide a scientific basis for their intelligent use by mankind. It maintains a central administrative office (now at the University of Michigan), and its first center of operations has been established at the University of Costa Rica, a member university. Instructional institutes are held in Costa Rica during February-March and July-August. Admission is on a competitive basis and is open to graduate students from all universities in the Americas. Transfer of course credits can be arranged.
GENERAL INFORMATION

TUITION AND FEES

(Tuition and fees subject to change)

Tuition and fees for graduate students are the same as for undergraduates. Out-of-state students pay the same tuition as resident students; however, out-of-state applicants pay a $10.00 credential evaluation fee.*

Tuition

Full-time students. Students registered for 12 or more credit hours in any semester pay $85.00.

Part-time students. Part-time regular session students pay $9.00 per credit hour.

Division of Continuing Education and Summer Session. Students registered in the division of continuing education and summer session pay $16.00 per credit hour.

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.

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.

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:

*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.
GENERAL INFORMATION

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.

SCHOLARSHIPS 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 readers or part-time teaching or technical assistants and carry a limited program of study. The initial remuneration is $3,000 payable in twelve monthly installments, and waiver of tuition up to a maximum of nine credit hours (including audit) 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 September 1 to June 15. Applications should be addressed to the chairman of the appropriate department and should be filed before March 1. Each application must be accompanied by a transcript of academic record and three letters of recommendation from professors of his major courses.

Research Assistantships. A number of one-half time research assistantships is available for graduate students in agriculture. Inquiries and applications for these should be addressed to the Dean of the College of Tropical Agriculture.

One-half time research assistantships are available in various other 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. 27 for details.

Fellowships. The Research and Fellowships office of the Graduate Division has available general information for other fellowships competitions open to graduate students which are administered by outside foundations or agencies. Since opening and closing dates of national competitions vary, as do application procedures and general requirements, it is suggested that the student obtain details from the persons indicated below:

Castle and Cooke Grant

Mr. H. Roy McArdle
University Placement Officer
<table>
<thead>
<tr>
<th>Program</th>
<th>Contact Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danforth Graduate Fellowships</td>
<td>Dr. James Linn</td>
</tr>
<tr>
<td>Danforth Teacher Grants</td>
<td>Dr. Pressley C. McCoy, Assoc. Dir. Danforth Foundation</td>
</tr>
<tr>
<td>NASA Predoctoral Research Training Program</td>
<td>Assoc. Dean, Research &amp; Fellowships, Graduate Division</td>
</tr>
<tr>
<td>NDEA, Title IV, Graduate Fellowship Program</td>
<td>Department Chairman</td>
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<tr>
<td>NDEA, Title V, Experienced &amp; Prospective Teacher Fellowship Program</td>
<td>Dean, College of Education</td>
</tr>
<tr>
<td>NDFL, Title VI, Modern Foreign Language Fellowships</td>
<td>Mr. Windsor Hackler, Executive Secretary Asian Studies Program</td>
</tr>
<tr>
<td>NDEA Institutes in Advanced Study, Title XI</td>
<td>Dean, Summer Session</td>
</tr>
<tr>
<td>Hawaii Teacher Corps Program</td>
<td>Dr. Cecil Dotts, Director</td>
</tr>
<tr>
<td>NIMH Fellowships</td>
<td>National Institutes of Health Bethesda, Maryland 20014</td>
</tr>
<tr>
<td>National Science Foundation Academic Year Institutes</td>
<td>Dr. Sidney Townsley, Department of Zoology</td>
</tr>
<tr>
<td>National Science Foundation Graduate Traineeships</td>
<td>Assoc. Dean, Research &amp; Fellowships, Graduate Division</td>
</tr>
<tr>
<td>Nursing Training Programs</td>
<td>Dean, School of Nursing</td>
</tr>
<tr>
<td>Public Health Service Predoctoral Fellowships</td>
<td>Chief, Career Development Review Branch, Div. of Research Grants National Institutes of Health Bethesda, Maryland 20014</td>
</tr>
<tr>
<td>Public Health Service Traineeships</td>
<td>Dean, School of Public Health</td>
</tr>
<tr>
<td>Social Work Training Programs</td>
<td>Dean, School of Social Work</td>
</tr>
<tr>
<td>Rehabilitation Services Administration Training Programs:</td>
<td>Chairman, Speech Department</td>
</tr>
<tr>
<td>Speech Pathology &amp; Audiology</td>
<td>Dr. Charles Neff, Assoc. Dean, College of Arts &amp; Sciences</td>
</tr>
<tr>
<td>National Defense Modern Foreign Language Graduate Fellowships</td>
<td></td>
</tr>
</tbody>
</table>
FINANCIAL AIDS

The University of Hawaii participates in the National Defense Student Loan, College Work Study and Guaranteed Loan Programs. All of these are Federally sponsored programs and are administered in accordance with Federal laws and guidelines.

Applications and information may be obtained from the Director of Financial Aids, 1627-A Bachman Place, Honolulu, Hawaii 96822. Applications should be returned by March 1 for consideration for the following school year. No action will be taken on applications for financial assistance until the student has been officially admitted to the University of Hawaii.

In applying for a Guaranteed Loan, first contact the State Guarantee Agency in the state where you maintain legal residence.

All new out-of-state students should also submit a Parents' Confidential Statement (PCS) through the College Scholarship Service. Application blanks may be obtained by writing to College Scholarship Service, Box 176, Princeton, New Jersey 08540; Box 881, Evanston, Illinois 60201; or Box 1025, Berkeley, California 94701.

Besides the Federal programs described above, the University maintains information about jobs in the community and on campus to assist students who seek part-time employment to defray a part of their expenses. Students are cautioned, however, about depending only on part-time work to meet the expenses of Hawaii's high cost of living. Applications for employment must be filed in person.

Veteran's Affairs. The Financial Aids Office assists veterans and/or their dependents with their enrollment at the University of Hawaii under the various Federal Veteran's Bills, including the "Cold War G. I. Bill." Students covered by any of these programs should present a proper "Certificate for Education and Training" or "Certificate of Eligibility and Entitlement" to the Veteran's Adviser at the time of registration in order to receive benefits. Any addition or reduction in credit load subsequent to initial registration in a semester or term must be reported immediately to the Financial Aids Office; this is the student's responsibility. Failure to properly report any changes in credit load promptly may result in overpayment and/or delayed payments. Inquiries regarding all veteran's affairs should be directed to the Veteran's Adviser, Financial Aids Office, University of Hawaii, 1627-A Bachman Place, Honolulu, Hawaii 96822.

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 $411 per semester.

**Off-Campus Housing**

The rush for off-campus accommodations usually starts about three weeks prior to beginning of classes.

The housing office offers listings of rooms in private homes, a few apartments, and room and board jobs. These units are not inspected and negotiations with landlords are made directly by students.

Names of landlords are not available through the mail because of a rapid turnover in a tight housing market. Names of students looking for roommates are also not available.

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.* Meals a la carte 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.
Expenses

Minimum expenses are estimated at approximately $2,175 per year for board, room, tuition, registration and special course fees, and books. Off-campus housing may be higher. These estimates do not include the cost of medical or dental expenses, additional dependents or transportation. Students from outside the state should add the cost of transportation to and from Hawaii and additional items for adjustment in a new community.

STUDENT HEALTH SERVICE

The Student Health Service is set up to assist all students in maintaining their state of health while attending the University of Hawaii. Every daytime registered student is eligible for these services, but the student is first required to have a medical examination performed by his personal physician and the results of this examination must be entered on the health form provided by the University. Payment for this medical examination is the personal responsibility of the student.

Health services will be denied to any student not providing this completed health form. In addition, students should be forewarned that medical clearances permitting them to enroll in physical education courses, intramural sports programs, etc., will be denied students not meeting this medical requirement.

The service offers a medical care program similar to that of the general office practice of medicine. A dispensary provides out-patient physician and nursing care 8:00 a.m. to 4:30 p.m. Monday through Friday and from 9:00 a.m. to 11:00 a.m. on Saturdays. The infirmary can provide beds for medical care for minor illnesses and injury on a 24-hour basis seven days a week during regular sessions of the University. A nurse is on continuous duty for the dispensary and infirmary services, and a physician remains on call during evenings and weekends.

A student may need to be referred to a physician in private practice for medical problems beyond the scope of the Student Health Service, for which the student must bear the total financial responsibility. Therefore, every student is well advised to enroll in a supplemental health insurance program in order to gain these off-campus medical and hospital care services. The Students' Accident and Sickness Medical Expense Plan sponsored by the ASUH is better tailored to meet student needs and is highly recommended.

Tuberculosis remains a distinct health hazard for all students. A tuberculin test is required of every student, and if found to be negative, he is cleared for all activities for four years. Those individuals with positive tuberculin tests must have follow-up chest x-rays on an annual basis. In view of the very much higher incidence of tuberculosis in foreign students,
chest x-rays are required for admission to the University, rather than a tuberculin test; however, once on campus, they fall under the same medical requirements as spelled out above for all students. Failure to comply with medical requirements may preclude registration.

COUNSELING AND TESTING CENTER

The Counseling and Testing Center's staff consists of professionally trained psychologists, psychiatrists, counseling 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 and administers a reading improvement program.

PLACEMENT AND CAREER PLANNING

The Office of University Placement and Career Planning assists students and alumni in the selection and pursuit of an optimum career. Services are provided in areas of self-analysis, vocational information, specific job opportunities, job campaigns, evaluation of offers, and graduate studies. The office cultivates the interest of prospective island, mainland and overseas employers and provides them with facilities to contact students and former students available for employment. Recruiting literature, annual statements, graduate and professional school bulletins, copies of the College Placement Annual and other career references are provided. Credential files are established for students interested in an academic career.

Campus interviews are scheduled with recruiting representatives of mainland and Hawaii organizations that offer career opportunities in business and industry, education and government. A number of recruiting firms are interested in hiring foreign students for employment in their home countries. In addition several hundred employment opportunities are listed with the office by employers who find it impractical to make campus visits.

Early registration is encouraged during the final year of study.

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 Admissions and Records Office 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.
GENERAL INFORMATION

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 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.

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 on 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.
GENERAL INFORMATION

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.

Testing and Evaluation. 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.

Exemption from ELI. The following classes of students are exempted from ELI training: (1) those whose native language is English; (2) those who hold a degree from an American college or university; (3) those whose English meets the University's standards for full-time study (determined by a proficiency test); and (4) those with TOEFL scores of 650 or higher.

Assignment to ELI Courses. All foreign students not exempted from ELI training are assigned to a program of ELI instruction designed to serve individual needs. Courses are offered at intermediate and advanced levels in oral English, structure, reading, and writing. ELI courses take precedence over all other course work. Enrolling in them may not be postponed until a subsequent semester, nor may they be dropped or taken in auditor status. Students who fail to comply with ELI assignments may be denied further registration at the University. Graduate students who have taken all of their undergraduate studies in the English language (with the exception of foreign languages) may, in counsel with their advisors, waive any or all ELI recommendations for course work.

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 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.
EAST-WEST CENTER

The East-West Center—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 is to further mutual understanding among the peoples of Asia, the Pacific area, and the United States. This goal is the guideline for the programs of intercultural action, research and technical training carried out by the Center in conjunction with regular academic instruction offered by the University. The Center operates through three main divisions, the Institute for Student Interchange, the Institute for Technical Interchange and the Institute of Advanced Projects.

Institute for Student Interchange

Scholarships. Young men and women possessing a high degree of leadership potential and scholastic ability and giving evidence of real interest in the goals of the Center may qualify for scholarships which provide transportation to and from Honolulu, tuition and books, housing in Center residence halls, meals, accident and health insurance, and a monthly incidental allowance. The scholarships may include field education on the mainland United States or in Asia. Scholarships are initially for 17 or 19 months with provisions for extensions for those who qualify.

Scholarships for American and Asia/Pacific students are primarily for graduate study at the University of Hawaii. There are some undergraduate scholarships for those students who come from countries where there are only a limited number of higher educational institutions.

Field Education. Field education provides opportunity to study in Asia or the Pacific islands for those American students in good standing who demonstrate their seriousness, maturity, and ability. Generally, students seeking advanced degrees request up to one semester for research purposes or course work in a university. Certain students whose primary goal is language study may be permitted to spend a longer period overseas in recognized full-time Asian language programs.

The U.S. mainland field education for the student in good standing from Asia or the Pacific provides an opportunity for special study on the mainland United States. This study is usually planned to take place during the summer or fall semester, after two semesters have been spent at the University of Hawaii.

Students on scholarship are expected to participate in intercultural activities as their academic requirements may allow.

Language Requirements. Because the medium of instruction at the University of Hawaii is English, Asian and Pacific student grantees 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.
GENERAL INFORMATION

American students are required to complete at least two years of Asian language study before the end of their grants.

Intercultural Activities conducted by East-West Center students are designed as a bridge that will enable Asians, Americans and Pacific area students to develop the intercultural understanding recognized as one of the basic functions of the Center. Both groups of students play a vital role in the program by providing sources of information and guidance and by their critical and constructive comparisons of the various Asian/Pacific societies with the variations in culture found in American society.

Institute for Technical Interchange

The Institute for Technical Interchange administers training projects for technical participants from Asia, the Pacific, and the United States. Training, planned on a long and a short term, group or individual basis, is designed to further understanding among nations at the same time technical knowledge is interchanged. Projects may last from 3 to 12 months and subject matter is chosen to fill needs of developing areas. Stress is now being given to training for those Pacific islands which are under the American flag. Current training projects include medical-nursing education for Pacific medical workers; agricultural and economic development in the Pacific and Asia; educational communications; techniques in teaching English to non-English speaking students; and programs designed to develop skills and to improve the status of women in developing areas. The institute also administers training and job observation in Hawaii for Agency for International Development participants and participants from other private or government agencies.

Institute of Advanced Projects

The Institute of Advanced Projects offers a unique program at the advanced professional level. Aimed at improving understanding and establishing better relations between East and West, the institute serves the Center's purpose in two ways: through exchange of persons and exchange and dissemination of information and scholarly materials.

The Senior Specialists program brings together distinguished persons from Asia, the Pacific area, and the United States for informal seminars, research, and writing.

Research Publications and Translations not only translates scholarly materials from and into Asian languages, but also compiles teaching and research aids, such as bilingual dictionaries and annotated bibliographies. Its programs include the Occasional Papers, IAP Reprints, and IAP Mimeographs.
Panels of advisers and consultants on substantive matters have been established to aid in selection of candidates and subject-matter emphases.

Center-wide Programs

In cooperation with the University, the East-West Center is moving gradually toward the problem-oriented approach in programming. This is aimed to coordinate the resources of all three institutes as well as those of the University in interdisciplinary and multicultural research, education and training involving specific problems affecting the quality of life in both East and West. The first to be implemented is the Population Studies Program for graduate students at the M.A. and Ph.D. levels in interdisciplinary studies with emphasis on the problems of population growth. Other activities of the Center which support all programs include the East-West Center Library, the East-West Center Press, the Intercultural Activities Office, the Conferences and Seminars Office, the Public Affairs Office, the Community Relations Office and Central Administration.

The East-West Center Library is building an outstanding collection of materials, including books, periodicals and microfilm, emphasizing national development and cross-cultural relations. It fosters cooperative Asian library and bibliographic activities to assist in the growth of libraries and librarianship in the developing countries of Asia. The East-West Center Press publishes new books originating within the Center as well as from other institutions and individuals throughout the world. It exports American books to Asia and imports Asian books in English.

The Intercultural Activities Office participates in programming and coordinates resources of the Center, the University and the larger Hawaii community which contribute to cross-cultural understanding.

The Conferences and Seminars Office supports international meetings of senior-level experts dealing with problems of mutual concern to East and West. Center-sponsored conferences are designed primarily to serve as a catalyzing force for planning and executing programs, but the Center also serves as host for other international meetings. The Public Affairs Office disseminates information on Center activities, with emphasis on the academic community but also enlisting mass media support. It maintains liaison with former participants in Center programs through alumni organizations and individuals who continue their commitment to East-West understanding. The Community Relations Office coordinates activities of the Center and its grantees with Hawaii's residents, working with the Friends of the East-West Center (an organization of volunteers).
GENERAL INFORMATION

The East-West Center complex includes Thomas Jefferson Hall, the administration building which houses 50 offices, a food center, conference rooms, and the Gallery; Hale Manoa, men’s residence; Hale Kuahine, women’s residence; John F. Kennedy Hall, theatre-auditorium; Abraham Lincoln Hall, which houses the Institute of Advanced Projects, the Library and Press. 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 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, headed by the Governor of Hawaii, represents the national interest in the Center and advises the U.S. Secretary of State.

FOR FURTHER INFORMATION

Asian-Pacific Scholarships. Write to the Director of Student Selection, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.

American Scholarships. Write or call on the Director of Student Selection, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.

Grants of the Institute of Advanced Projects. Write to the Director, Institute of Advanced Projects, Lincoln Hall, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.

Technical Training. Write to the Director, Institute for Technical Interchange, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.
OVERSEAS CAREER PROGRAM

The Overseas Career Program is 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. Requirements for the certificate include 15 hours of credit at the graduate level.

For further information, write the Director, J. M. Allison, LL.D., Office of Overseas Career Program, University of Hawaii.

POPULATION STUDIES PROGRAM

The Population Studies Program is a graduate-level program designed to provide students with a basic understanding of one or more academic disciplines and to acquire a special competence in the application of concepts and tools of these disciplines to the study of various aspects of the population problem. It is open only to students who are intended candidates for graduate degrees in anthropology, economics, geography or sociology. The proposed program consists of fulfilling the requirements for the Master’s degrees in anthropology, economics, geography or sociology, plus three required core courses in population studies and related courses already offered in various fields of study, including public health.

The student should write to the department chairman of the specific discipline in which he is interested for further information regarding this program.

RESERVE OFFICERS TRAINING COURSE

The graduate student is now offered the opportunity to be commissioned a second lieutenant in the U.S. Army after two years of ROTC training. This program extends the advantages of ROTC to students who have at least two full years remaining prior to completion of their advanced degree requirements. Applicants for the two-year ROTC program should apply to the department of military science on the University campus prior to the start of the spring semester of the year before they expect to enter the program.
Academic Information

ADMISSION

Deadlines. To insure completion of action on applications for admission to the Graduate Division, applications should be postmarked no later than May 1 for the fall semester, November 1 for the spring semester, and April 1 for the summer session.

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 the receipt of 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.

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. Records of examinations (GRE, MAT, etc.) as required by departments. (See special requirements under field listings.)
4. Credential evaluation fee (out-of-state residents).

*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.
ACADEMIC INFORMATION

Unclassified students for summer session only:
1. Certification of degree or transcript. (Write to: Director of Admissions and Records)

Graduates of Foreign Universities (non-Americans):
Classified students:
1. Application form.
2. Transcripts (two complete sets) from each institution attended.
3. Credential evaluation fee.
4. Records of examinations (GRE, MAT, ATGSB, etc.) as required by departments. (See special requirements under field listings.)
5. 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:
June October or January
September January or March
February March, June, or October

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. Information regarding the exact dates, locations, fees, etc., is available from: TOEFL, Educational Testing Service, Princeton, New Jersey 08540. Please do not write to the University of Hawaii for information on TOEFL.

SUMMER SESSION

Students applying for admission to the summer session only should apply to: Director of Admissions and Records, 2444 Dole St., Honolulu, Hawaii 96822. However, students wishing to apply for admission to a degree program beginning with the summer session should apply to the Graduate Division, Student Services, for regular admission.

*See p. 26 for information relating to the University’s English Language Institute, and its role in testing and evaluating the English proficiency of foreign students.
ACADEMIC INFORMATION

ENTRANCE EXAMINATIONS

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

Graduate Record Examination (GRE). Students must apply to the Educational Testing Service at least one month prior to the date of the examination to take the test. Applicants may write directly to: Graduate Record Examinations, Educational Testing Service, 1947 Center Street, Berkeley, California 94704. The test dates, test fees, and registration deadlines are posted on Graduate Division bulletin boards on all campuses. The tests are generally administered six times a year (usually January, February, April, July, October and December).

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, July and August of each year at a cost of $10.00.

Medical College Admission Test. (MCAT) Students must apply to the Psychological Corporation by writing: Medical College Admission Test, The Psychological Corporation, 304 East 45th Street, New York, New York 10017. Information on test dates and deadlines is available at the Counseling and Testing Center. There is a fee of $25.00 for taking the test.

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.
ACADEMIC INFORMATION

Probational students are those who have been admitted provisionally 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 non-degree training or certificate programs.

UNCLASSIFIED STUDENTS

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

Students with baccalaureate degrees who have been denied admission to the Graduate Division and who are in unclassified status may be reconsidered for admission to the Graduate Division only after they have completed at least 12 more units of relevant non-lower-division work subsequent to the denial.

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 register as unclassified graduate students in the Division 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.

Transcript. Certification of the bachelor's degree by transcript must be submitted to the Graduate Division office upon registration for degrees awarded in June and by November 30 for those awarded in August. Students who fail to meet this requirement will not be permitted to register for the spring semester.

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:
ACADEMIC INFORMATION

8 credits, including 2 or more graduate courses
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 hours of course work (including audit courses and 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 eight class days following regular registration. See Calendar, “Last day of registration for credit.” Similar restrictions apply to summer session.

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 at the college dean's office.

Withdrawal from Courses. To withdraw from a course, a student must have the written consent of the instructor of the course on a form available at the office of the department offering the course. After the student and instructor sign the form, the student keeps one copy, returns one to the instructor, and a third to the department office.

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 mark of W if and only if he completely withdraws from the University with the approval of the dean of the college in which he is registered. When a student ceases to attend class without officially withdrawing, the instructor may award one of two grades: W (withdrawal) or I (incomplete). The point during the semester at which the instructor will give an I rather than a W will be determined by the instructor, with the main criterion for the I
being the feasibility of the student making up the work within the prescribed time limit for the next semester.

Refunds for withdrawals from courses are noted under “Tuition and Fees — Refunds.” Students seeking tuition refunds for withdrawals from courses should see the Business Office in Bachman Hall immediately upon withdrawing, bringing with them their copy of the withdrawal form.

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 or 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 non-laboratory 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 $A$, $B$, $C$, $D$, $F$, 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 $D$.

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 procrastination. Instructors will send a report of "Incomplete" to each student receiving an $I$, indicating 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 should be computed on the basis of what grades or other evidence the instructor does have, averaged together with $F$'s for all the incompleted 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 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 $F$.

Students entering as undergraduates with advanced standing are not given grade points for work done elsewhere. But on work done at the University of Hawaii, such students must gain grade points in the same proportion to credit hours required for graduation as that demanded of other students.

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 $W$, $I$, or Pass 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.
ACADEMIC INFORMATION

PASS-FAIL OPTION

The major purpose of the Pass-Fail 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 P, passing, or F, failing. The grade of P is not computed in the student's grade-point ratio; the grade of F is.

The Pass-Fail Option may be exercised during the periods in which withdrawal from courses is permitted and only within the following conditions:

1. The student has the approval of his adviser;
2. the student is in good standing (not on academic probation);
3. the student takes a maximum of two pass-fail courses in any one term;
4. a pass grade for all courses taken on the pass-fail basis will be the equivalent of at least a C—.
5. the course will not be used to fulfill the requirements for a master's degree. Directed reading and research 699/799 courses, however, may be taken on Pass-Fail 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 (2 credits in Plan A thesis programs).

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 Pass-Fail Option. Grades of P 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 F under the Pass-Fail Option are 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 an undergraduate 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 requirements for a graduate degree.

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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 approval 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 graduate 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.

CONFERRING OF DEGREES

Degrees are conferred and diplomas awarded four times annually, in January, June, August and September. Commencement exercises are held in June 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 Master of Arts is offered in:
- American Studies
- Anthropology
- Art
- Asian Studies
- Asian Languages (Chinese, Japanese)
- 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
- Animal Sciences
- Astronomy
- Biochemistry
- Biophysics
- Botany
- Chemistry
- Civil Engineering
- Electrical Engineering
- Entomology
- Food Science
- Genetics
- Geosciences
- Horticulture
- Information Sciences
- Mechanical Engineering
- Microbiology
- Nursing
- Nutrition
- Ocean Engineering
- Oceanography
- Pharmacology
- Physics
- Physiology
- Plant Pathology
- Public Health
- Soil Science
- 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 Fine Arts is offered for creative production rather than research in: Architecture
- Art
- Drama and Theatre.
ACADEMIC INFORMATION

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, 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.

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 Divi-
sion 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.** Thirty credit hours are required, including a minimum of 18 credit hours of course work and between 6-12 credit hours of thesis research. 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 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.

**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 June graduation, May 15 for January 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 registering for thesis research 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 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 signed by all members of the committee, must be submitted to committee members at least two weeks prior to the date of the final 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.

Examinations

General Examinations. Before admission to candidacy the student must pass a general examination in his major field of study. This examination is given during the first semester. 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.

A student who fails the general examination may repeat it after three months 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 Oral Examination. This examination, covering the thesis and related areas, may be given at the option of the individual graduate field of study. If given, 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 faculty members. As an alternative, the committee chairman may have the candidate present the 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 upon recommendation of the graduate faculty concerned and approval of the Dean of the Graduate Division.

Summary of Procedure

1. Application for admission to the Graduate Division.
2. Preliminary conference; appointment of interim adviser.
ACADEMIC INFORMATION

(Progress Report 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 thesis committee. (Form III submitted, with copy to student.)

5. Approval of thesis topic. (Form IV submitted, with copy to student.)

6. Application for diploma.

7. Payment of graduation and thesis binding fee.


9. Final oral examination—optional. (Form VI submitted; student notified of results.)

10. Final copies of thesis submitted to Graduate Division.

11. Granting of the degree. (Form VII submitted.)

PLAN B (NON-THESIS)

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 • Business Administration • Civil Engineering • Drama and Theatre
- Economics • Educational Administration • Educational Communications
- Educational Foundations • Educational Psychology • Electrical Engineering • Elementary Education • English • Entomology
- Food Science • Geography • Geosciences • German • History
- Horticulture • Information Sciences • Library Studies
- Linguistics • Mathematics • Mechanical Engineering • Microbiology
- Music Education • Music Performance • Nursing • 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. Before admission to candidacy the student must pass a general examination in his major field of study. This examination is given during the first semester. 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.

A student who fails the general examination may repeat it after three months upon recommendation of the graduate faculty of the major field of study and approval of the Dean of the Graduate Division. The student will not be considered for candidacy again should he fail the general examination twice.

Final Examination. A final examination is required of all Plan B candidates. This final examination may take one of several forms at the option of the candidate's major field of study. Possible forms may include a seminar appearance, a written comprehensive examination, an oral examination, some equivalent, or even combination of forms. This examination should be given at least three weeks before the end of the term during which the degree is conferred. All members of the graduate faculty shall be invited and all members of the committee must be present, if the examination is other than a written examination, in which case the program committee or a departmental committee will conduct the examination. Should the student fail the final examination, he may be permitted to repeat the examination only if this is recommended by the graduate faculty concerned and if a petition, recommended for approval by the graduate faculty, is approved by the Dean of the Graduate Division. At least three months must elapse before such re-examination.

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, 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.
6. Final examination. (Form VI submitted; student notified of results.)
7. Payment of graduation fee.
8. Completion of course work.
9. Granting of the degree. (Form VII submitted.)
ACADEMIC INFORMATION

DOCTOR OF PHILOSOPHY

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.

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
- Anthropology
- Astronomy
- Biochemistry
- Biophysics
- Botany
- Chemistry
- Drama and Theatre
- Educational Psychology
- Electrical Engineering
- Entomology
- Genetics
- Geography
- Geosciences
- History
- Horticulture
- Linguistics
- Microbiology
- Oceanography
- Pharmacology
- Philosophy
- Physics
- Physiology
- Political Science
- Psychology
- Sociology
- Soil Science
- Zoology

**Residence**

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

**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 course, see the section of this bulletin appropriate to the field of study.

**Language Requirements**

The student must 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 examination will be administered by the faculty of the appropriate language department, or by the Counseling and Testing Center (or the ETS foreign language examinations). If the language examination is to be administered by one of the language departments, the several graduate faculties will provide suitable materials on which to base the examination.
Examinations are given three times each year as announced by the Graduate Division.

The student must pass the language examination before he can be admitted to candidacy. In fields of study in which two foreign languages are required, the Graduate Division office must be notified that the candidate has passed the examination in both languages before he will be permitted to 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, 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:

1. **Comprehensive examination.** This examination, which may be either oral or oral and written, covers the major field and one or more of the minor fields, the latter represented by a member or members of the dissertation committee. Candidates who fail the comprehensive examination may repeat it at the discretion of the graduate faculty concerned, no sooner than three months after the first examination. A candidate who fails the second examination is irrevocably dropped from candidacy. At least eight months must elapse between the satisfactory completion of the comprehensive examination and the final oral examination.

2. **A final oral examination in defense of the dissertation.** This examination cannot be taken until after the comprehensive examination has been passed. If the student 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.

Arrangements for the final examination must be made at least one month in advance, and it must occur at least three weeks before the end of the session in which the degree is granted. All members of the committee must be present.

**Dissertation**

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

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

A graduate student may undertake a research problem when the sub-
ject 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 instruction 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 accept-
able 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 com-
pleted. 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.

Chairmen 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.
8. Abstract of dissertation filed with the Graduate Division.
9. Final examination. (Form VI submitted.)
10. Copies of dissertation filed in Graduate Division.
11. Payment of graduation and dissertation binding fee.
12. Granting of the degree. (Form VII submitted.)

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.

PROFESSIONAL TEACHING CERTIFICATE

The Department of Education of the state of Hawaii issues the professional teaching certificate to teachers in the employ of the department who, after receiving the Bachelor of Education degree or its equivalent, earn a total of 30 semester hours, 6 of which must be in graduate courses (600–799) in education. For purposes of such certification, the Bachelor of Education equivalent is defined as a bachelor's degree with 18 semester hours in education courses and practice teaching under the supervision of an accredited teacher training institution.
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.
The department offers a master's degree program under Plan A (thesis) or Plan B (non-thesis), and a program leading to the Ph.D. Candidates for the M.S. degree are ordinarily drawn from students with undergraduate majors in agricultural economics, economics, or business administration. Applicants with other undergraduate training will be considered on an individual basis. Students with inadequate training in agricultural economics may be required to take appropriate undergraduate courses.

The Ph.D. program is designed to prepare the student for comprehensive examinations in four fields.

(1) General economics, including price and income theory.

(2) Agricultural economics, including farm management, production economics, marketing, price analysis, market development, agricultural policy, agricultural economic development, and resource economics.

(3) Research methods.

(4) An individual field of specialization.

The dissertation will normally be written in one of the fields of specialization within agricultural economics, as listed in (2) above.

AGRICULTURAL ECONOMICS

410 Introduction to Quantitative Methods in Agricultural Economics (3)
423 Agricultural Cooperatives (3)
424 Marketing of Tropical and Subtropical Agricultural Products (3)
425 Marketing of Livestock, Poultry and Dairy Products (3)
426 Management of Agri-Business Firms (3)
428 Production Economics (3)
429 Agricultural Policy and Planning (3)
430 Agricultural Finance (3)
431 Introduction to Natural Resource Economics (3)
433 Advanced Farm Management and Plantation Economics (3)
434 Statistical Methods (3)
435 Economics of Food Distribution (3)
480 Computer Programming in Agricultural Economics Research (3)
624 Research Methodology (3)
AGRICULTURAL ENGINEERING

625 Economics of Agriculture: Tropical Countries and Asia (3)
626 Collection of Economic Data in Agriculture (3)
629 Production Economics (3)
630 Market Development for Agricultural Products (3)
637 Resource Economics (3)
680 Rural Sociology and The Agric. Economy (3)
699 Directed Research (arr.)
701 Seminar in Agric. Economics (arr.)

Agricultural Engineering

Graduate Faculty
J. K. Wang, Ph.D. (Chairman)—farm processing, power and machinery
H. M. Gitlin, M.S.—cooling and handling of farm products
D. M. Kinch, Ph.D.—power and machinery, farm processing
Tung Liang, Ph.D.—farm machinery, operations research
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 agricultural, civil, or mechanical engineering program or the equivalent.

Courses available for the graduate program are listed below. Courses from the related fields of civil engineering, mechanical engineering, electrical engineering, mathematics, physics, food science, agronomy and soil science may be approved in a degree program. Normally, students are required to take Mathematics 402 and Agricultural Engineering 647. Candidates may specialize in tropical fruit and nut harvesting equipment, tropical fruit processing equipment, agricultural hydrology, surface irrigation engineering, physical properties of tropical fruits and soil dynamics. Required courses are marked with an asterisk.

AGRICULTURAL ENGINEERING

331 Mechanizing Food Production I (3)
332 Engineering Application in Food Production (3)
342 Junior Project (1)
344 Senior Project (1)
431 Agricultural Power (3)
432 Agricultural Implements (3)
435 Agricultural Irrigation (3)
442 Handling, Storage and Processing Equipment (3)
631 Analysis of Implement Design (3)
635 Farm Irrigation System Design (3)
647 Methods of Agricultural Engineering (3)
648 Post Harvest Process Engineering (3)
699 Directed Research (arr.)
*700 Seminar (1)
*800 Thesis Research (arr.)
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. The soil science option also requires two years of college chemistry. Related fields for agronomy are chemistry, climatology, plant physiology, botany, genetics, soil science, plant pathology, horticulture, animal science, and zoology. Related subject matter fields for soil science are chemistry, mathematics, physics, geosciences, botany, agronomy, microbiology, and agricultural engineering.

The Plan A (thesis) program is required of all 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 Sci. 699) may be allowed toward the degree under this plan. All candidates must register for seminars in agronomy or soil science.

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 degree of Ph.D. in agronomy and soil science is awarded only for distinguished scholarly achievement. The dissertation, which is a significant original contribution to 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.

Candidates will be required to take a predoctoral examination similar in nature to the general examination taken by all candidates for the M.S. degree. They will also be required to take written and/or oral comprehensive examinations and a final oral examination which will include a public defense of the dissertation. Prior to taking the comprehensive examinations, candidates must demonstrate proficiency by examination in either French, Spanish, German, or Russian.

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**

310 Tropical Crop Production (3)
411 Sugar Cane Agronomy (3)
412 Pineapple Culture (2)
413 Pasture Management (3)
610 Physiology of Crop Production (3)
621 Breeding of Asexually Propagated Crops (2)
699 Directed Research M.S. (arr.)
701 Seminar in Advanced Agronomy (1)
710 Mineral Nutrition of Tropical Crops (2)
799 Directed Research Ph.D. (arr.)
800 Thesis Research (arr.)

**SOIL SCIENCE**

460 Soil Physics (3)
461 Soil Erosion: Causes and Controls (3)
470 Tropical Soil Survey and Interpretation (3)
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. (arr.)
704 Seminar in Advanced Soil Science (1)
799 Directed Research Ph.D. (arr.)
800 Thesis Research (arr.)
The American studies department offers a program designed as an interdisciplinary and intercultural approach to the study of the United States. Taking advantage of the University's location, library resources, and faculty interest, the department places a special emphasis on the problems of American relationships with Asian nations and cultures.

Recognizing the unique nature of the program and the difficulties of adequate undergraduate preparation, especially for Asian students, 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 work in those fields before their acceptance as degree candidates. The department offers an M.A. program under either Plan A (with thesis) or Plan B (non-thesis) programs. Under either plan candidates are required to take a minimum of 12 semester credits in American studies courses. In addition, candidates must submit a program which includes courses in the following fields of study:

1. The Humanities (literature, art, music, philosophy, religion).
2. The Social Sciences (anthropology, economics, geography, history, political science, sociology).

Plan A normally should include a minimum of 6 hours in each of the fields of study. Plan B normally should include a minimum of 9 hours in each of the fields of study.

American candidates having a special interest in Asia can obtain the certificate offered by the Overseas Career Program in conjunction with the M.A. in American studies.

AMERICAN STUDIES

475 American Taste (3)
485-486 Contemporary American Civilization (3)
490 Special Topics (1969-70: Americans and Chinese) (3)
495 Black Americans and American National Character (3)
615 Leaders and Movements in American Thought (3)
631 Mass Media in American Society (3)
635 Perspectives in Comparative Literature (3)
641 Asian Influences in American Civilization (3)
The M.S. in animal sciences is offered in the fields of genetics, nutrition, 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 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.
ANTHROPOLOGY

Anthropology

Graduate Faculty

T. W. Maretzki, Ph.D. (Department Chairman)—East Asia; psychological and applied anthropology, culture change
G. Bateson, M.A.—Melanesia, Indonesia; culture and personality, communicational aspects of culture
S. T. Boggs, Ph.D.—culture and personality, education and anthropology, methods
A. G. Dewey, Ph.D.—Indonesia, Polynesia, Melanesia; social anthropology, culture change (on leave 1969-70)
D. Eyde, Ph.D. (Coordinator of Graduate Studies)—Pacific; social organization
R. Green, Ph.D.—Oceania, archeology, ethnology
W. P. Lebra, Ph.D.—East Asia; social anthropology, religion
K. Luomala, Ph.D.—Polynesia and Micronesia; ethnology and folklore
D. L. Oliver, Ph.D.—Oceania; social anthropology
R. J. Pearson, Ph.D.—Southeast Asia, East Asia, Hawaii; archeology
W. G. Solheim II, Ph.D.—Southeast Asia; archeology

Affiliate Faculty

K. E. Emory, Ph.D.—Polynesia; archeology, ethnology
R. W. Force, Ph.D.—Oceania; culture change
S. A. Howard, Ph.D.—Polynesia; social and psychological anthropology, ethnoscience
Y. Sinoto, D.Sc.—Polynesia and Japan; archeology
D. Yen—Oceania, Southeast Asia; ethnobotany

Intended candidates for the M.A. or Ph.D. need not have an undergraduate background in anthropology. Students with the B.A. in related fields are welcome.* During the first semesters of graduate work, all students are expected to acquire a common knowledge of the basic areas in the field: biological anthropology, linguistics, archeology, social (including psychological) anthropology. A familiarity with the historical development of anthropology as a formal discipline, and with anthropological methods, is also expected of all students. Anthropology 650, 651, 652, and 653 are designed to take up major issues and problems in biological, archeological, social, and psychological anthropology. Linguistics courses are offered in the department of linguistics.

The graduate program is designed to allow specialization within two broad fields of anthropology: social and psychological anthropology, and archeology. Anthropologists who wish to concentrate on linguistic studies may work in a program jointly with the department of linguistics. A broad base in related courses in the social sciences, humanities, and natural sciences is strongly recommended for all students and specializations are expected to cross disciplinary lines.

*Although there are no formal requirements for prior course work in anthropology, candidates may find that lack of previous training in anthropology may result in some extra work to fill existing gaps. Decisions concerning such needs are made by the coordinator for graduate studies after consultation of the entire graduate faculty following a recommendation of the student's advisory committee.
ANTHROPOLOGY

M.A.

The M.A. candidate has a choice of a thesis (Plan A) or a non-thesis (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 and normally a minimum of 6 in related fields.

After a common core of anthropological knowledge has been established during the first year, students are free to develop their specialized interests. All students are required to take Anthropology 400, 410, 700, and two offerings of 750. All students must demonstrate reading knowledge of one foreign language useful in the candidate's research or area of specialization. The M.A. candidate who selects Plan A (thesis) must pass a final oral examination on subject materials related to the thesis. For candidates who select Plan B (non-thesis) an oral examination is given only after all other requirements are satisfied.

Ph.D.

In addition to the broad preparation in anthropology described as prerequisite for the M.A. degree, the doctoral candidate must demonstrate competence in anthropological theory construction, research design, and the collection and evaluation of data. He will be encouraged to undertake faculty supervised research prior to submitting his dissertation proposal and conducting dissertation research. He will also be expected to develop and demonstrate his abilities in teaching. While not all candidates will be teaching assistants, they are encouraged to give lectures or other presentations to undergraduate or graduate students and the faculty.

Required courses or their equivalents are Anthropology 400, 410, 700, either 710 or 420-421 and 4 semester offerings of 750. Ph.D. candidates are examined for a reading knowledge of one foreign language, as required by the Graduate Division. The department of anthropology requires competence in a second field language which may be spoken rather than written, or in computer skills. An intensive oral examination is given to all Ph.D. candidates prior to the beginning of field research. This examination is administered by the Ph.D. thesis committee; all members of the department's graduate faculty attend as participating examiners. This examination will test for general knowledge in the geographical area in which the candidate is specializing as well as for the areas of theory pertinent to the candidate's special field of interest. The doctoral dissertation must be based on fieldwork. Such fieldwork should not be less than eight months, but is normally expected to last at least a year. The department requests a copy of both M.A. and Ph.D. theses for the department files.

Courses for the graduate program may be selected from those listed below and from offerings in related fields of study with approval of the candidate's supervisory committee. A bimonthly seminar is scheduled
for the presentation of theoretical issues and original research by faculty, graduate students, and visiting anthropologists. Graduate students are expected to attend.

Applications for admission to the graduate program in anthropology should include the following information: (1) two transcripts; (2) Graduate Record Examination scores; (3) background information, including a detailed statement on the student's interest in anthropology, his plans for study and a career in the field (application forms are available from the department and the Graduate Division); (4) three letters of reference from faculty members who can evaluate the applicant’s potential for graduate studies.

ANTHROPOLOGY

ANTHROPOLOGY

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Architecture

**Graduate Faculty**
- A. Bruce Etherington, B. Arch., (Chairman)—architecture
- T. D. Terazaki, M.E.—architectural engineering
- C. Mahoney, Dip. AA—tropical architecture

**Affiliate Faculty**
- F. Haines, B.A., M. Arch.—professional practice
- W. Grant, B.A., B. Arch.—urban design and planning
- T. Creighton, B.A.—architectural history and theory

The professional degree of M.F.A. 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. 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 M.F.A. in architecture are accepted from three categories.

1. Holders of bachelors' degrees in a major other than architecture. Such students are required to complete 63 credits of undergraduate architectural preparatory work and 28 credits of post-graduate architectural preparatory work before becoming candidates.

2. Holders of the B.F.A. in environmental design 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.

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 engineers, architects, landscape architects, urban designers and/or planners.

Because of Hawaii’s climate and geographical position, the department offers training on the tropical aspects of architecture, recognizing, however, that the underlying principles of architecture are universal. Students from areas bordering or within the Pacific Basin, as well as from other tropical countries, will be able to obtain specialized training with regard to the problems of building in tropical climates and developing countries.
ART

401 Architectural Structures “D” (4)
402 Architectural Structures “E” (4)
411 Building Technology “C” (3)
412 Building Technology “D” (3)
421 Environmental Control (3)
431 Architecture “D” (4)
432 Architecture “E” (4)
438 Architecture “F” (5)
439 Architecture “G” (5)
470 Environmental Studies Seminar (2)
471 Field Studies
472 Japanese Architecture and Landscaping (3)
601 Architectural Kinetics (4)
616 Professional Practice (3)
621 Seminar on Tropical Architecture (2)
640 Architecture and Planning in Tropical Areas (4)
699 Directed Work (2)

Art

Graduate Faculty

C. W. Anderson, M.A.—painting design
J. H. Cox, M.A.—painting, oceanic art
M. Havaas, M.F.A.—weaving, textile design
C. F. Horan, M.A.—ceramics
S. Kimura, M.A.—painting
K. G. Kingrey, M.A.—design
G. Lenox, B.A.—design
H. O. McVay, M.A.—ceramics
P. Neogy, M.A.—Asian art
B. Norris, B.A.—painting
H. A. Robinson, M.A.—textiles
E. Stasack, M.F.A.—painting, printmaking
M. Turnbull, M.A.—painting

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. 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 awarded for creative studio work in one or more of the following media: (1) drawing and printmaking, (2) painting, (3) weaving and textiles, (4) ceramics, (5) visual design, (6) sculpture. The course work includes 24 credits in studio and related fields plus 6 credits of 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 to candidacy 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. It is unlikely that the M.F.A. can be earned with less than two years of study.

Courses available for the graduate program are listed below. A maximum of 10 hours may be earned in certain advanced courses in anthropology, classics, English, history, music, and philosophy, or other pertinent fields.

Courses numbered 300–499 may be taken in other than the candidates' field of specialization in art. Prerequisite: consent of instructor and graduate adviser.

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ART
407  Advanced Photography (3)
470  Renaissance Through Rococo (3)
471  Art and Architectural Field Studies (arr.)
472  Primitive Art (3)
475  Arts of the Pacific (3)
483  Modern Art of Japan (3)
485  Applied Arts of China (3)
491  Art of Islam (3)
495  Art of Southeast Asia (3)
617  Printmaking (3)
624  Painting (3)
630  Textile Design (3)
638–639  Weaving (3–3)
635  Rug and Tapestry Techniques (3)
646  Ceramics (3)
647  Ceramics (3)
648  Ceramic Glazes and Clay Bodies (3)
649  Ceramics (3)
663–664  Visual Communication (3–3)
665  Advanced Typography (3)
675  Arts of Hawaii (3)
676  Arts of Indonesia and Melanesia (3)
680  Early Chinese Paintings (3)
686  Later Chinese Paintings (3)
691  Arts of Central Asia (3)
699  Directed Research (arr.)
773–774  Visual Design Research (5–5)
780  Early Arts of Japan (3)
781  Later Arts of Japan (3)
791  Buddhist and Hindu Art (3)
800  Thesis Research (arr.)
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Asian Languages

Graduate Faculty

John Young, Ph.D. (Chairman)—Japanese and Chinese: applied linguistics, civilization
J. T. Araki, Ph.D.—Japanese: literature
J. DeFrancis, Ph.D.—Chinese: applied linguistics, civilization
N. Fujioke, M.A.—Japanese: classical and modern grammar
T. W. Gething, Ph.D.—Thai: linguistics
B. Hoffer, Ph.D.—Japanese: linguistics
H. Ikeda, Ph.D.—folklore: Japanese bibliography and literature
P. H. Lee, Ph.D.—East Asian comparative literature
Fang Kuei Li, Ph.D.—Chinese and Thai: linguistics
Nguyen-Dang-Liem, Ph.D.—Vietnamese: linguistics
C. T. Lo, Ph.D.—Chinese: folklore and traditional literature
W. H. Maurer, Ph.D.—Sanskrit: literature
Y. Uyehara, M.A.—Japanese: poetry and modern literature
V. H. Viggilemo, Ph.D.—Japanese: modern literature and thought
L. P. H. C. Winters, M.A.—Chinese: classical poetry and modern literature
Hsin-Nunl Yao, B.A.—Chinese: literature

The department of Asian and Pacific languages offers the M.A. in Chinese and Japanese. Both Plan A (thesis) and Plan B (non-thesis) 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 (non-thesis), 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.

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

CHINESE

401—402 Fourth-Level Chinese (3—3)
404 Accelerated Fourth-Level Chinese (6)
421—422 Advanced Chinese Conversation (3—3)
431—432 Chinese for Reading Knowledge (3—3)
433—434 Selected Readings in Chinese (3—3)
ASIAN LANGUAGES

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)
453-454 Study of Chinese Characters (2-2)
461-462 Introduction to Modern Chinese Literature (3-3)
470 Language and Culture of China (3)
490 Reference Materials for Chinese Studies (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)
619-620 Chinese Etymology (3-3)
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)
651 Historical and Philosophical Texts: Pre-T'ang Period (3)
652 Historical and Philosophical Texts: T'ang-Ch'ing Periods (3)
693-694 Methods in Chinese Studies (3-3)
750 Research Seminar in Chinese (3)
800 Thesis Research (arr.)
AP 690 Directed Reading (arr.)
AP 699 Directed Research (arr.)
AP 761-762 Seminar in East Asian Comparative Literature (3-3)

JAPANESE

401-402 Fourth-Level Japanese (3-3)
404 Accelerated Fourth-Level Japanese (6)
411-412 Advanced Japanese Aural Comprehension (3-3)
421-422 Advanced Japanese Conversation (3-3)
431-432 Selected Readings in Japanese
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)
461 Introduction to Modern Japanese Literature (3)
462 Introduction to Traditional Japanese Literature (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)
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)
631-632 History of Japanese Language (3-3)
641-642 Contrastive Study of Japanese and English Structure (3-3)
643-644 Methodology in Teaching of Japanese as a Second Language (3-3)
690 Japanese Bibliography (3)
Asian Studies

Graduate Faculty
H. J. Wiens, Ph.D. (Director)—geography

East Asia
F. C. Hung, Ph.D. (Chairman)—economics

Southeast Asia
F. W. Riggs, Ph.D. (Chairman)—political science

South Asia
N. M. Bowers, Ph.D. (Chairman)—geography

The graduate program in Asian studies is designed primarily for students who have taken their B.A. in a discipline and who wish to focus their work at the M.A. level on a particular geographical and cultural region of Asia. The program is open also to Asian nationals provided they focus 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 non-thesis program.

Graduate work in Asian studies is supervised and coordinated through three area program committees. These committees represent the areas of East Asia, Southeast Asia, and South Asia. The student is expected to focus his work upon one of the regions of Asia as represented by the area committees.

Students desiring to enter the graduate program in Asian studies should present a minimum of 12 hours of work in courses related to Asia in addition to introductory Asian language courses. Students not having this background may be required to take, without credit toward the degree, certain preparatory courses designated by their respective area committee. Attention 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 of 15 hours of courses approved by the departmental adviser 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;
(4) a minimum of 6 hours of credit in an Asian language at the fourth-year level or higher.

ASIAN STUDIES

798 Seminar in Asian Studies (3)
   (1) Multidiscipline Seminar in East Asian Studies
   (2) Multidiscipline Seminar in Southeast Asian Studies
   (3) Multidiscipline Seminar in South Asian Studies

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
T. K. Menon, Ph.D.—radio astronomy and galactic structure
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 chemistry and mathematics through differential equations are also required. Candidates for admission must also submit results of the Physics and Aptitude sections of the Graduate Record Examination.

Courses in astronomy available for the graduate program 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

*621 Stellar Atmospheres I (3)
622 Stellar Atmospheres II (3)
623 Stellar Interiors and Evolution (3)
*627 Galactic Structure I (3)
628 Galactic Structure II (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)
R. H. McKay, Ph.D.—physical biochemistry, biological oxidations
B. Morton, Ph.D.—ribosomal structure and function
H. F. Mower, Ph.D.—biological nitrogen fixation; hydrogenase enzymes; energy transfer mechanisms
T. Winnick, Ph.D.—metabolism and biosynthesis of proteins and peptides
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. and Ph.D. degrees are offered in both biochemistry and biophysics. 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>441</td>
<td>Basic Biochemistry</td>
<td>(3)</td>
</tr>
<tr>
<td>442</td>
<td>Basic Biochemistry Laboratory</td>
<td>(1)</td>
</tr>
<tr>
<td>601-602</td>
<td>General Biochemistry</td>
<td>(3-3)</td>
</tr>
<tr>
<td>611-612</td>
<td>General Biochemistry Laboratory</td>
<td>(2-2)</td>
</tr>
<tr>
<td>605</td>
<td>Medical Biochemistry</td>
<td>(4)</td>
</tr>
<tr>
<td>710</td>
<td>Special Topics in Enzymology</td>
<td>(2)</td>
</tr>
<tr>
<td>715</td>
<td>Advanced Carbohydrate Metabolism</td>
<td>(2)</td>
</tr>
<tr>
<td>720</td>
<td>Bioenergetics</td>
<td>(2)</td>
</tr>
<tr>
<td>730</td>
<td>Nucleic Acids and Viruses</td>
<td>(2)</td>
</tr>
<tr>
<td>740</td>
<td>Advanced Protein Chemistry</td>
<td>(2)</td>
</tr>
<tr>
<td>671</td>
<td>Seminar</td>
<td>(1)</td>
</tr>
<tr>
<td>799</td>
<td>Directed Research</td>
<td>(arr.)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research</td>
<td>(arr.)</td>
</tr>
</tbody>
</table>
Biophysics

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>601-602</td>
<td>Survey of Biophysics (3–3)</td>
</tr>
<tr>
<td>603</td>
<td>Biophysics Laboratory (3)</td>
</tr>
<tr>
<td>701</td>
<td>Molecular Structure and Function of Chromosomes (2)</td>
</tr>
<tr>
<td>702</td>
<td>Electron &amp; Nuclear Magnetic Resonance Studies in Biological Systems (2)</td>
</tr>
<tr>
<td>703</td>
<td>Conformational Analysis of Biopolymers (2)</td>
</tr>
<tr>
<td>704</td>
<td>The Role of Free Radicals in Biological Systems (2)</td>
</tr>
<tr>
<td>799</td>
<td>Directed Research (arr.)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
</tr>
</tbody>
</table>

Botany

Graduate Faculty

N. P. Kefford, Ph.D. (Chairman)—regulation of development and growth
E. K. Akamine, M.S.—post harvest physiology, tropical fruits
G. E. Baker, Ph.D.—mycology, fungal ecology and pathology
A. J. Bernatowicz, Ph.D.—algal systematics
H. F. Clements, Ph.D.—sugar cane physiology, crop-logging
B. J. Cool, Ph.D.—mineral nutrition, salt uptake
M. S. Doty, Ph.D.—marine ecology
D. J. C. Friend, Ph.D.—quantitative growth, radiation effects
R. D. Goos, Ph.D.—tropical fungi, their systematics and distribution
C. H. Lamoureux, Ph.D.—developmental morphology of ferns
D. Mueller-Dombois, Ph.D.—tropical and pioneer ecology
S. Nakata, Ph.D.—developmental physiology of tree crops
E. W. Putman, Ph.D.—carbohydrate biochemistry
S. M. Siegel, Ph.D.—exobiology, stress physiology and biochemistry
A. C. Smith, Ph.D.—evolution and systematics

Affiliate Faculty

F. R. Fosberg, Ph.D.—tropical ecology and systematics
B. Krauss, M.S.—anatomy of the pineapple plant
L. G. Nickell, Ph.D.—physiology of sugar cane
P. van Royen, Ph.D.—systematics of tropical species
W. H. Wagner, Ph.D.—systematics

Intended candidates for either the M.S. or Ph.D. degrees must present a minimum of 18 hours of undergraduate credit in botany or related subjects such as microbiology, developmental biology, genetics or biochemistry. Additional work required to remedy deficiencies and for degree programs will be decided through a diagnostic examination at the time of enrollment in the department and by continuing faculty counseling. Thesis work may be undertaken in four broad areas: environmental botany; physiology and biochemistry; structure and development; and systematics and evolution. Appropriate organisms for research may be selected from the algae, fungi, ferns, or flowering plants, representing tropical, marine or economic plants. Courses available for the graduate program are listed below.
BUSINESS ADMINISTRATION

BOTANY
410  Plant Anatomy (3)
412  Microtechnique (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)
454  Ecology II (4)
461  Systematics of Vascular Plants (4)
470  Principles of Plant Physiology (4)
480  Phycology (3)
610  Botanical Seminar (1)
612  Advanced Botanical Problems (arr.)
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 (arr.)
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—Mnemophyta and Phaeophyta (2)
684  Phycology—Rhodophyta (2)
699  Directed Research (arr.)
799  Directed Research (arr.)
800  Thesis Research (arr.)

Business Administration

Graduate Faculty
E. Richman, D.Eng.Sc. (Chairman)—management
J. Adler, Ph.D.—accounting, finance
L. W. Ascher, Ph.D.—finance
J. K. Bailey, Ph.D.—management
E. M. Barnet, Ph.D.—management, marketing, travel industry management
D. W. Bell, B.S.—real estate, land economics
H. D. Bess, Ph.D.—transportation
R. B. Buchele, Ph.D.—management
P. N. H. Chung, Ph.D.—business economics, statistics
C. F. Congdon, M.B.A.—statistics
D. A. Corbin, Ph.D.—accounting, finance
E. W. J. Faison, Ph.D.—marketing
J. B. Ferguson, Ph.D.—personnel management, industrial relations
L. P. Freitas, Ph.D.—finance
T. Q. Gilson, Ph.D.—management, industrial relations
BUSINESS ADMINISTRATION

H. W. Grayson, Ph.D.—business economics
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
S. Kim, Ph.D.—business economics
A. L. KirKPatrick, M.A.—business economics, money and banking
S. S. O. Lee, Ph.D.—accounting
H. D. Lowe, D.B.A.—accounting
J. Miccio, Ed.D.—management
J. R. Omps, Ph.D.—accounting
E. C. Pendleton, Ph.D.—labor economics, industrial relations
H. S. Roberts, Ph.D.—labor economics, industrial relations
K. K. Seo, Ph.D.—business economics, money and banking
C. H. Spencer, Ph.D.—accounting
H. B. Stellmacher, M.B.A.—marketing

At press time for this catalog, the College of Business Administration was in the process of revising its Graduate Program. For information regarding the Master of Business Administration Program and/or the graduate courses offered by the College, please refer to the MBA Program Bulletin available from the College of Business Administration.

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 organizations). 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 incorporates studies of an international nature. The M.B.A. program is presently being offered on the Manoa Campus in Honolulu and also in Japan.

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

There are no undergraduate prerequisites to the program; students are admitted on the basis of undergraduate grade averages and the results of the ATGSB examination.
Graduate Faculty

R. G. Inskeep, Ph.D. (Chairman)—infrared spectroscopy, hydrogen bonding, complex ions
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. A. Duce, Ph.D.—nuclear and atmospheric chemistry, trace element analysis by neutron activation analysis
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
E. F. Klefer, 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
J. J. Naughton, Ph.D.—analytical, physical, solid state and geochemistry
L. L. Schaefer, 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

Affiliate Faculty

G. E. Felton, Ph.D.—food technology, carbohydrate chemistry
H. W. Hilton, Ph.D.—agricultural chemicals and carbohydrates

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.

Courses may 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 comprehensive research and study opportunities in analytical, inorganic, organic, physical and environmental chemistry in a well-equipped, mod-
CIVIL ENGINEERING

ern facility. Additional details of programs may be found in a departmental brochure.

CHEMISTRY

424  Preparative Inorganic Chemistry (3)
445  Modern Synthetic Methods (4)
621  Introductory Quantum Chemistry (3)
622  Advanced Inorganic Chemistry I (3)
623  Advanced Inorganic Chemistry II (3)
631  Instrumental Methods of Analysis (4)
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 (arr.)
731–732  Special Topics in Analytical Chemistry (arr.)
741–742  Special Topics in Organic Chemistry (arr.)
744  Organic Applications of Spectroscopy (3)
751–752  Special Topics in Physical Chemistry (arr.)
753  Quantum Chemistry (3)
756  Statistical Mechanics (3)
758  Crystallography (3)
799  Directed Research (arr.)
*800  Thesis Research (arr.)

Civil Engineering

Graduate Faculty

T. Mitsuda, Ph.D. (Chairman)—applied mechanics
C. L. Bretschneider, Ph.D.—ocean engineering
A. N. L. Chiu, Ph.D.—structures
J. R. Evans, M.S.—soil mechanics
M. L. P. Go, Ph.D.—structures
R. A. Grace, Ph.D.—hydrology, hydraulics
H. P. Harrenstien, Ph.D.—applied mechanics
R. W. Haselwood, M.S.—transportation and soil mechanics
H. S. Hamada—structures, applied mechanics
L. S. Lau, Ph.D.—hydrology, environmental and sanitary engineering
Z. L. Moh, Ph.D.—structures
R. S. Szilard, Ph.D.—structures, applied mechanics
G. T. Taoka, Ph.D.—applied mechanics
J. A. Williams, Ph.D.—hydromechanics

Intended candidates for the M.S. in civil engineering must present a B.S. in civil engineering or the equivalent. Both Plan A and Plan B are
available. Choice of plan must be made before 14 credits of graduate work applicable to the degree have been completed.

Plan A requires 9 credits of thesis work and may include a maximum of 6 credits of approved courses in fields other than civil engineering. At least two graduate seminars are required.

The program under Plan B requires 30 credits of graduate study. It normally includes 24 credits in graduate civil engineering courses and 6 credits in approved courses in other departments. At least two graduate seminars are required.

CIVIL ENGINEERING

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
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<td>Applied Probability and Statistics in Engineering</td>
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<td>477</td>
<td>Advanced Dynamics</td>
<td>(3)</td>
</tr>
<tr>
<td>621</td>
<td>Advanced Fluid Mechanics I</td>
<td>(3)</td>
</tr>
<tr>
<td>622</td>
<td>Advanced Fluid Mechanics II</td>
<td>(3)</td>
</tr>
<tr>
<td>624</td>
<td>Flow in Porous Media</td>
<td>(3)</td>
</tr>
<tr>
<td>626</td>
<td>Surface Water Hydrology</td>
<td>(3)</td>
</tr>
<tr>
<td>627</td>
<td>Ground Water Hydrology</td>
<td>(3)</td>
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<tr>
<td>651</td>
<td>Soil Mechanics</td>
<td>(3)</td>
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<tr>
<td>655</td>
<td>Applied Soil Mechanics I</td>
<td>(3)</td>
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<tr>
<td>656</td>
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<td>671</td>
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<td>672</td>
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<td>(3)</td>
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<td>673</td>
<td>Theory of Plasticity</td>
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<tr>
<td>674</td>
<td>Stability of Structures</td>
<td>(3)</td>
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<td>675</td>
<td>Theory of Vibrations</td>
<td>(3)</td>
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<td>676</td>
<td>Structural Dynamics</td>
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<td>677</td>
<td>Energy Methods in Applied Mechanics</td>
<td>(3)</td>
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<tr>
<td>678</td>
<td>Theory of Plates</td>
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<td>679</td>
<td>Theory of Thin Shells</td>
<td>(3)</td>
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<td>681</td>
<td>Advanced Indeterminate Structures</td>
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<tr>
<td>682</td>
<td>Numerical Methods of Structural Analysis</td>
<td>(3)</td>
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<td>683</td>
<td>Advanced Reinforced Concrete Design I</td>
<td>(3)</td>
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<tr>
<td>684</td>
<td>Advanced Reinforced Concrete Design II</td>
<td>(3)</td>
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<tr>
<td>685</td>
<td>Plastic Analysis of Metal Structures</td>
<td>(3)</td>
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<td>696</td>
<td>Selected Topics in Civil Engineering</td>
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<td>697</td>
<td>Seminar in Civil Engineering I</td>
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<td>698</td>
<td>Seminar in Civil Engineering II</td>
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<td>699</td>
<td>Directed Reading or Research (arr.)</td>
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<td>800</td>
<td>Thesis Research (arr.)</td>
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</table>

SPECIAL PROGRAM IN ENVIRONMENTAL AND SANITARY ENGINEERING

In addition to the regular graduate faculty in engineering, the following are utilized in this program: N. C. Burbank, Sc.D. (Program Adviser); H. W. Klemmer, Ph.D.; R. K. C. Lee, M.D., Dr. P. H.; R. M. Worth, M.D., M. P. H., Ph.D.; R. H. F. Young, Sc.D.; and A. Q. Y. Tom, Sc.D. (of the Affiliate Graduate Faculty).

Administered with the close cooperation of the department of public
health, the program is intended for candidates with a B.S. in engineering who meet the Graduate Division admission qualifications. Plan A (thesis program) is highly recommended for this program of study although in exceptional cases Plan B (non-thesis) may be permitted. Suggested electives are Public Health 600–601, 658, 663, 664, 681, 771, 791; Chemistry 655, 656; Zoology 330, 417, 620, 629, 718; Microbiology 625, 632, 655; Civil Engineering 621, 622, 624, 655, 656.

Ordinarily, at least one full calendar year will be needed to complete the program. Courses marked with an asterisk are required.

**CIVIL ENGINEERING**

<table>
<thead>
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<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>626</td>
<td>Surface Water Hydrology (3)</td>
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<tr>
<td>627</td>
<td>Ground Water Hydrology (3)</td>
<td></td>
</tr>
<tr>
<td>631</td>
<td>†ESE Theory I (3)</td>
<td></td>
</tr>
<tr>
<td>632</td>
<td>ESE Theory II (3)</td>
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<td>633</td>
<td>ESE Design I (3)</td>
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<tr>
<td>634</td>
<td>ESE Design II (3)</td>
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<tr>
<td>*635</td>
<td>ESE Chemistry (4)</td>
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<td>*636</td>
<td>ESE Microbiology (4)</td>
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<td>637</td>
<td>ESE Laboratory (3)</td>
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<td>638</td>
<td>ESE Public Health (3)</td>
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<tr>
<td>*697</td>
<td>Seminar in Civil Engineering (1)</td>
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<tr>
<td>*698</td>
<td>Seminar in Civil Engineering (1)</td>
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<td>699</td>
<td>Directed Reading or Research (arr.)</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
<td></td>
</tr>
</tbody>
</table>

†Environmental and Sanitary Engineering

**Drama and Theatre**

**Graduate Faculty**

E. Ernst, Ph.D. (Chairman)—Oriental theatre, aesthetics
J. Brandon, Ph.D.—Oriental theatre, playwriting
E. Langhans, Ph.D.—theatre history
E. MacQueen, Ph.D.—acting, theatre management
R. Mason, M.F.A.—design
B. Ortolani, Ph.D.—Oriental theatre, theory
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 is a record of creative work in play production, playwriting, design, or dance.

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

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

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 statement of their proposed area of research, 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 general and theatre portions of the Graduate Record Examination.

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>340</td>
<td>Advanced Stagecraft (3)</td>
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<tr>
<td>350</td>
<td>Design in the Theatre (3)</td>
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<tr>
<td>352</td>
<td>Costume for the Stage (3)</td>
</tr>
<tr>
<td>370</td>
<td>Creative Dramatics (3)</td>
</tr>
<tr>
<td>372</td>
<td>Drama in Performance (3)</td>
</tr>
<tr>
<td>381-382</td>
<td>Intermediate Modern Dance (3-3)</td>
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<tr>
<td>383-384</td>
<td>Intermediate Ballet (3-3)</td>
</tr>
<tr>
<td>388</td>
<td>Dance Composition (3)</td>
</tr>
</tbody>
</table>
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 (arr.)

Economics

Graduate Faculty
B. Campbell, Ph.D. (Chairman)—macroeconomic theory, monetary theory
W. Gorter, Ph.D.—international economics
F. Hung, Ph.D.—microeconomic theory, economic development
R. Kamins, Ph.D.—public finance
Y. Lim, Ph.D.—microeconomic theory, economic development
S. Naya, Ph.D.—international economics, economic development
H. Oshima, Ph.D.—national income accounting, economic development
R. Pollock, Ph.D.—macroeconomic theory, public finance
E. Shaw, Ph.D.—monetary theory
Y. Yeh, Ph.D.—international economics, microeconomic theory
W. Miklius, Ph.D.—microeconomic theory, industrial organization

The M.A. program in economics is designed to prepare people for careers as research economists in government and business, for junior college teaching, and for advanced graduate studies leading to the Ph.D.

Students should have completed courses in elementary statistics and intermediate microeconomic and macroeconomic theory prior to entering
the M.A. program. Students not having completed these courses will be expected to do so before being admitted to candidacy.

Economics 600, 601, and 424 (or its equivalent elsewhere) will be required of all M.A. candidates. Plan B candidates must pass a written examination in economic theory and in two other fields selected from the following: economic development, econometrics, mathematical economics, international economics, public finance, regional economics, monetary theory. In addition to writing an acceptable thesis, Plan A candidates must pass a written examination in economic theory. A maximum of 6 semester credits in outside fields is allowed in Plan A and 9 in Plan B.

ECONOMICS

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)
414 Economic Development of Japan (3)
415 Asian Economic Development (3)
420 Mathematical Economics (3)
424 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)
460 International Trade Theory (3)
461 International Finance (3)
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)
496 Selected Topics in Contemporary Economic Problems (3)
600 Macroeconomic Theory (3)
601 Microeconomic Theory (3)
602 Economic Growth and Fluctuations (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)
660 International Trade Theory (3)
662 International Finance (3)
670 Human Resources and Manpower Economics (3)
Educational Administration

Graduate Faculty
J. B. Crossley, Ed.D. (Chairman) — administration of intermediate, secondary, community college, and administrative leadership
R. R. Dunwell, Ed.D. — school plant, educational administration
H. V. Everly, Ph.D. — general school administration
C. R. Ingils, Ed.D. — school plant, supervision, educational leadership
L. D. Jackson, Ed.D. — school law, school finance, general administration
R. W. Johnson, Ed.D. — general school administration, legal and business administration, theory of administration
J. L. Yucker, Ed.D. — systems analysis in education, school plant

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 Graduate Record Examination and the Miller Analogies Test (a minimum score at the 50th percentile is required in both tests); (3) successful completion of EA 685; and (4) the oral interview by the department of educational administration.

Plan A requirements include 3 semester hours in educational foundations, 3 semester hours in educational psychology, 3 semester hours in research methods, and at least 2 seminars in educational administration or supervision. Included in the requirements under Plan B are 9 to 15 semester hours in fields other than educational administration and supervision, 3 semester hours in educational foundations, 3 semester hours in educational psychology, one seminar in educational administration or supervision, one additional seminar in administration or supervision, terminal in nature, and directed by the candidate's program committee.

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 candidate.
EDUCATIONAL ADMINISTRATION

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 (arr.)
700 Research Seminar in Educational Administration (3) ✧
720 Seminar and Internship in Administrative Leadership (arr.)
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 (arr.)

*Master's candidates.
†EA 685 shall be taken during the 1st semester for those students working toward a M.Ed. in Educational Administration.
✧EA 700 shall be taken during the last semester of work for M.Ed. of Educational Administration candidates.

Educational Communications

Graduate Faculty

W. A. Wittich, Ph.D. (Chairman)—educational communications and public administration
L. A. Butler, Jr., Ph.D.—educational communications and curriculum development
G. Z. Kucera, Ph.D.—communications and sociology
G. B. Mendelson, Ed.D.—communications and fine arts
R. A. Sanderson, Ph.D.—educational communications
R. J. McBeath, Ph.D.—educational communications and philosophy

The master's degree program in educational communications is designed to educate candidates in the nature and use of new educational media as they can be applied to the improvement of teaching and learning. Participating candidates will be involved in the following areas of activity: (1) the evaluation of educational media research and the relationship of these research findings to demonstrations and innovations through which the selection and use of educational media may improve teaching and learning; (2) the evaluation and creation of plans for using
existing available audio-visual materials in the improvement of instruction; (3) the production and use of needed graphics and films which are not currently available; and (4) participation as a media intern officially accepted by the administration of a public or private school.

Applicants for admission must possess a bachelor's degree from an accredited institution, and a teaching certificate or what in the opinion of the staff constitutes a reasonable substitute experience.

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) the Graduate Record Examination: aptitude test (verbal and quantitative), and advanced test (Education code 34 only).

Thesis and non-thesis programs are based on 30 credits beyond the B.A., at least 21 of which must be in the field of educational communications as such. Thesis Plan A requires 24 credits plus 6 thesis credits. Non-thesis Plan B requires 30 credits and in addition, the completion of a seminar report.

EDUCATIONAL COMMUNICATIONS

<table>
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<tr>
<th>Course No.</th>
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<td>614</td>
<td>Audiovisual Media Systems (3)</td>
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<tr>
<td>620</td>
<td>Introduction to Instructional Materials Production (3)</td>
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<tr>
<td>623</td>
<td>Survey and Production of Asian Study Materials (3)</td>
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<tr>
<td>625</td>
<td>Production of Educational Film and Multimedia Presentations (3)</td>
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<td>630</td>
<td>Television in Education (3)</td>
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<td>635</td>
<td>Advanced Educational Television (3)</td>
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<td>Programmed Learning (3)</td>
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<td>Seminar in Organization and Administration of Media Programs (3)</td>
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<td>800</td>
<td>Thesis Research (arr.)</td>
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Educational Foundations

Graduate Faculty

R. Stueber, Ph.D. (Chairman)—history
S. Amioka, Ph.D.—philosophy, Japanese education
R. S. Anderson, Ph.D.—comparative education
W. H. Boyer, Ed.D.—philosophy, social foundations
S. Jaeckel, Ed.D.—history, social foundations
A. M. Keppel, Ph.D.—history
V. Kobayashi, Ph.D.—comparative education, philosophy
R. E. Potter, Ed.D.—history, social foundations
V. D. Rust, Ph.D.—comparative education, history

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, the 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 the scholar and practitioner, theory and practice, and the humanistic and scientific components of education are avoided.

Intended candidates for the M.Ed. 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 prior to admission to candidacy.

Admission to candidacy is based upon a combination of such factors as the quality of the student's undergraduate record, his graduate record, the Graduate Record Examination and a general interview of the student by a faculty committee.

Both Plan A (thesis) and Plan B (non-thesis) are available. 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. Only 2 credits of 699 may be included in Plan A. Plan B: The program normally includes 18 semester hours of education of which at least 12 are in the department of educational foundations. Twelve semester hours in a planned and approved sequence of courses which carry graduate credit in other fields are also normal requirements in Plan B. No more than 6 credits of 699* may be included in Plan B. A written comprehensive examination is given as the student nears completion of Plan B.

In both Plan A and Plan B, requirements include at least two of the listed Ed EF courses marked with asterisks and at least one seminar in the department. Plan B requirements normally include an additional seminar in the department, Ed EF 768, which is taken in the last semester of candidacy.

In both Plan A and Plan B, courses in fields of study other than educational foundations will normally be concentrated in one or two of the following: philosophy, history, economics, political science, religion, sociology, anthropology, Asian studies, American studies, or other graduate fields in education. Graduate courses in educational foundations not listed may be included in degree programs with the approval of the chairman.

EDUCATIONAL FOUNDATIONS

*445 Educational Sociology (3)
480 Anthropology and Education (3)
*650 Historical Foundations of Western Education (3)
*651 History of American Education (3)

*See department brochure.
EDUCATIONAL PSYCHOLOGY

History of Education in Hawaii (3)
Philosophy of Education (3)
Foundations of Comparative Education (3)
Comparative Education: Europe and America (3)
Comparative Education: Asia (3)
The Church and the School (2)
Social Foundations of Education (3)
Education in America (3) (for foreign students only)
Directed Research (arr.)
Recent History of American Education (3)
Educational Utopias (2)
History of American Higher Education (3)
Seminar in Educational Theory (2)
  (1) Educational Issues
  (2) John Dewey
  (3) Contemporary Educational Philosophers
  (4) Japanese Educational Philosophy
  (5) History of Education
Comparative Ideologies and Education (3)
Seminar in Problems in Education (2)
Seminar in Comparative Education (2)
Thesis Research (arr.)

Educational Psychology

Graduate Faculty
D. A. Leton, Ph.D. (Chairman)—school psychology
D. C. Adkins, Ph.D.—statistics and measurement
R. S. Alm, Ph.D.—remedial reading
V. Bhushan, Ed.D.—statistics
W. T. Carse, Ed.D.—school counseling
T. M. C. Chang, Ph.D.—education of culturally disadvantaged, school psychology
F. E. Clark, Ed.D.—counseling, student personnel work
D. R. Collins, Ed.D.—school counseling
P. Dunn-Rankin, Ed.D.—statistics, computer application
G. Y. Fujita, Ph.D.—statistics
D. W. Fullmer, Ph.D.—counseling; group and individual
D. K. McIntosh, Ed.D.—education of mentally retarded
T. A. McIntosh, Ed.D.—psychological foundations in education
A. M. Niyekawa-Howard, Ph.D.—social psychology, psycholinguistics
I. E. Reid, Ph.D.—learning, measurement
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, special education, learning, measurement, and research methods. The curricula in counseling and guidance and special education meet 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. 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 departmental requirements are in addition to those of the Graduate Division which are described in the "Academic Information" section of this catalog.
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 research trainees in the Education Research and Development Center for a minimum of one semester.

EDUCATIONAL PSYCHOLOGY

404 Education of Exceptional Children (3)
405 The Mentally Retarded (3)
406 Curriculum Development for Mentally Retarded Children (3)
408 The Emotionally Disturbed Child (3)
409 Culturally and Economically Disadvantaged Pupil (3)
410 Curriculum Development for the Emotionally Disturbed (3)
414 Education of Gifted Children (3)
416 Tests and Measurements (3)
429 Introductory Statistics (3)
450 Practicum Experience with the Mentally Retarded (9)
451 Practicum for Teachers of Emotionally Disturbed Children (9)
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 (arr.)
701 Seminar in Guidance (3)

(1) School Psychology, (2) Testing, (3) Counseling,
(4) Vocational, (5) Elementary School, (6) Administration,
(7) Group Procedures

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 (arr.)
Graduate Faculty

B. Kinariwala, Ph.D. (Chairman)—system theory; signal theory
N. Abramson, Ph.D.—information theory and coding; pattern recognition, satellite communications
R. Chattopadhyay, Ph.D.—system theory, automatic control
G. Fang, Ph.D.—plasma dynamics; physical electronics; ocean acoustics
B. S. M. Granborg, Ph.D.—automatic control systems
H. H. H. Hwang, Ph.D.—power system analysis; energy conversion
F. F. Kuo, Ph.D.—system theory; computer applications
S. Lin, Ph.D.—information theory; error-correcting codes
K. Najita, Ph.D.—electromagnetic theory
W. W. Peterson, Ph.D.—error-correcting codes; information theory; computers
T. H. Roelofs, Ph.D.—radio wave propagation; ionospheric physics
P. F. Weaver, Ph.D.—radio science; ionospheric physics
E. J. Weldon, Jr., Ph.D.—error correcting codes; data communications
P. C. Yuen, Ph.D.—radio science, satellite communications

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 are available. Plan A includes 12 credits in EE 800, Thesis Research. Plan B requires 30 credits of graduate study in approved technical courses. In both plans, at least 18 credits must be in courses numbered above 600.

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.

A knowledge of one foreign language sufficient for reading electrical engineering literature is required. A language which will be useful to the student in his research must be chosen and the choice must meet the approval of the graduate faculty of the department of electrical engineering.

The intended candidate for the Ph.D. degree must take a general examination covering the electrical engineering fundamentals usually covered in undergraduate programs and must demonstrate a superior understanding of these fundamentals. This examination will be offered every semester and must be taken by all intended Ph.D. candidates who have not passed it. A student who does not pass it by the time he has spent two semesters as an intended Ph.D. candidate may be dropped from the Ph.D. program.
After passing the general examination, the student should arrange to have a thesis committee appointed, consisting 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. The language examination must have been passed before the comprehensive examination is taken.

When the student passes the comprehensive examination, he is admitted to candidacy for the Ph.D. degree and proceeds with his dissertation research.

At the conclusion of his research, the student writes a dissertation. The dissertation is reviewed by the thesis committee and must be approved by a majority of the committee. Finally, the student must pass a final oral examination primarily covering his dissertation.

**ELECTRICAL ENGINEERING**

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<th>Course</th>
<th>Title</th>
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<td>411</td>
<td>Introduction to System Analysis (3)</td>
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<td>422</td>
<td>Electronic Instrumentation (3)</td>
</tr>
<tr>
<td>423</td>
<td>Instrumentation Laboratory (1)</td>
</tr>
<tr>
<td>425</td>
<td>Electronics III (3)</td>
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<tr>
<td>427</td>
<td>Topics in Physical Electronics (3)</td>
</tr>
<tr>
<td>435</td>
<td>Power System Analysis (3)</td>
</tr>
<tr>
<td>436</td>
<td>Direct Energy Conversion (3)</td>
</tr>
<tr>
<td>446</td>
<td>Information Theory and Coding (3)</td>
</tr>
<tr>
<td>451</td>
<td>Feedback Control Systems (3)</td>
</tr>
<tr>
<td>452</td>
<td>Feedback Control Systems Laboratory (1)</td>
</tr>
<tr>
<td>461</td>
<td>Digital Techniques (3)</td>
</tr>
<tr>
<td>462</td>
<td>Digital Techniques Laboratory (1)</td>
</tr>
<tr>
<td>463</td>
<td>Analog Computers (3)</td>
</tr>
<tr>
<td>466</td>
<td>Computer Organization and Programming Techniques (3)</td>
</tr>
<tr>
<td>467</td>
<td>Algorithmic Languages (3)</td>
</tr>
<tr>
<td>473</td>
<td>Microwave Theory and Techniques (3)</td>
</tr>
<tr>
<td>475</td>
<td>Radio-wave Propagation (3)</td>
</tr>
<tr>
<td>491-492</td>
<td>Special Topics in Electrical Engineering (3-3)</td>
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<tr>
<td>495-496</td>
<td>Special Topics Laboratory (1-1)</td>
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<tr>
<td>611-612</td>
<td>Network Synthesis (3-3)</td>
</tr>
<tr>
<td>613</td>
<td>Linear System Analysis (3)</td>
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<tr>
<td>614</td>
<td>Analysis of Nonlinear Systems (3)</td>
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<tr>
<td>616</td>
<td>System Theory (3)</td>
</tr>
<tr>
<td>618</td>
<td>System Optimization (3)</td>
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<tr>
<td>623</td>
<td>Advanced Electronic Instrumentation (3)</td>
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<tr>
<td>627</td>
<td>Advanced Topics in Physical Electronics (3)</td>
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<tr>
<td>645</td>
<td>Introduction to Linear Systems and Noise (3)</td>
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<tr>
<td>646</td>
<td>Signal and Noise Theory (3)</td>
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<tr>
<td>647</td>
<td>Applied Statistical Decision Theory (3)</td>
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<tr>
<td>648</td>
<td>Error-Correcting Codes (3)</td>
</tr>
</tbody>
</table>
ELEMENTARY EDUCATION

649  Error-Correcting Codes II (3)
651  Advanced Feedback Control Systems (3)
652  Optimization Techniques in Control Systems (3)
653  Adaptive Control (3)
654  Concepts of Digital System Control (3)
655  Sampled-Data Control Systems (3)
656  Concepts of Systems Engineering (3)
657  Hybrid Automatic Control Systems (3)
661  Theory and Design of Digital Machines (3)
671-672 Electromagnetic Theory and Applications (3-3)
673  Magneto-Ionic Theory (3)
675-676 Advanced Microwave Theory (3-3)
677  Antenna Theory (3)
693  Special Topics in Electrical Engineering (3)
697-698 Seminar in Electrical Engineering (1-1)
699  Directed Reading or Research (arr.)
800  Thesis Research (arr.)

Elementary Education

Graduate Faculty
E. C. Jenkins, Ph.D. (Chairman)—elementary curriculum, supervision, 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
A. J. Picard, Ph.D.—mathematics education
A. L. Pickens, Ed.D.—art education
M. R. Porter, Ph.D.—curriculum, supervision (on leave)
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,* 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.

*National Teacher Examination—preferably taken prior to application but must be taken before completing 12 graduate credits. GRE scores acceptable in lieu of N.T.E.
Required courses in elementary education are marked with an asterisk below.

CURRICULUM AND INSTRUCTION

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>619</td>
<td>Children's Literature in the Elementary Curriculum (3)</td>
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<tr>
<td>620</td>
<td>Teaching Reading in the Elementary School (3)</td>
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<tr>
<td>621</td>
<td>Modern Language Arts Program, Elementary (3)</td>
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<tr>
<td>622</td>
<td>Elementary School Curriculum (3)</td>
</tr>
<tr>
<td>623</td>
<td>The Elementary Science Curriculum (3)</td>
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<tr>
<td>624</td>
<td>The Elementary Mathematics Curriculum (3)</td>
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<tr>
<td>625</td>
<td>The Elementary Social Studies Curriculum (3)</td>
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<tr>
<td>626</td>
<td>Art in Elementary Education (3)</td>
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<td>629</td>
<td>Curriculum Development in Creative Expression (3)</td>
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<td>640</td>
<td>Seminar in Teaching Fields</td>
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<td>646</td>
<td>Reading Difficulties</td>
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<td>647</td>
<td>Clinical Procedures in Reading</td>
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<tr>
<td>667</td>
<td>Curriculum Trends in Early Childhood Education (3)</td>
</tr>
<tr>
<td>722</td>
<td>Seminar in Elementary Curriculum Foundations (3)—Limited to master's candidates</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
</tr>
</tbody>
</table>

*For those who wish to concentrate on Early Childhood Education CI 667 may be substituted for CI 622.

English

Graduate Faculty

- G. L. Anderson, Ph.D. (Chairman)—18th-century literature, Asian and comparative literature
- J. M. Backus, Ph.D.—American literature
- C. S. Bouslog, Ph.D.—English romanticism, 20th-century British and American literature
- R. H. Canary, Ph.D.—American literature
- R. Crymes, Ph.D.—modern English grammar
- A. G. Day, Ph.D.—consultant in Pacific literature
- A. Friedson, Ph.D.—20th-century literature
- J. W. Frierson, Ph.D.—Victorian literature
- T. H. Fujimura, Ph.D.—Restoration literature, drama
- J. Gray, Ph.D.—literary criticism and theory
- W. E. Huntsberry, M.A.—writing
- R. L. Larson, Ph.D.—rhetoric and composition, Restoration literature
- A. P. Leib, Ph.D.—American literature, medieval literature, Pacific literature
- M. Lester, Ph.D.—English language and grammar
- 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
- Y. Shen, Ed.D.—English language
- 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
- W. Wilson, Ph.D.—drama, playwriting
- L. E. Winters, Ph.D.—comparative literature, Chinese and American literature
Intended candidates for the M.A. are expected to present, in addition to the customary freshman and sophomore composition and literature survey courses, 27 semester hours of undergraduate credit in English or closely related subjects, including Shakespeare, English literature, and American literature. In addition, courses in English and American history and in classical and European literature are desirable. A reading knowledge of an ancient or modern European language is required. Courses for the graduate program are to be selected from the list below; however, a number of advanced courses in other disciplines may be approved as part of a program. Required courses are marked with an asterisk; English 780 or 785 is required, not both, also 401 or 402.

In addition to the regular concentration in English and American literature, the department now offers a concentration in the English language.

Both Plan A and Plan B are available. Plan A requires 21 hours.

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

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**

- **661** Medical and Veterinary Entomology (3)
- **662** Advanced Systematic Entomology (3)
- **663** Scale Insects (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)
- **697** Entomology Seminar (1)
- **699** Directed Research (arr.)
- **800** Thesis Research (arr.)

**Food Science**

**Graduate Faculty**

- H. A. Frank, Ph.D. (Chairman) — food science, food microbiology
- A. Bevenue, B.S. — pesticide residues
- J. W. Hylin, Ph.D. — pesticide metabolism
- H. Matsumoto, Ph.D. — food toxicology
- E. Ross, Ph.D. — food technology of tropical products, food irradiation
- H. Y. Yamamoto, Ph.D. — food and plant biochemistry

**Affiliate Faculty**

- J. E. Brekke, M.S. — fruit chemistry and processing technology
- 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 agricultural and/or biological sciences (including general microbiology), and college algebra and trigonometry.

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 hazards, utilization of seafoods, tropical and interrelated Asian food products.

Under Plan B, a minimum of 30 semester hours of course work is required.

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**

- **601** Principles in Food Science and Technology (3)
- **603** Microbiology of Foods (3)
- **604** Laboratory Methods for Food Microbiology (2)
- **610** Principles of Tropical Food Processing and Preservation (3)
- **611** Chemistry and Technology of Tropical Food Products (3)
- **620** Seminar (1)
- **640** Food Safety (2)
- **699** Directed Research (arr.)
- **701** Recent Advances in Food Research (1)
- **730** Biochemical and Chemical Aspects of Foods (3)
- **799** Directed Research (arr.)
- **800** Thesis Research (arr.)

**French**

*Graduate Faculty*

E. Jackson, Ph.D. (Chairman)—novel, criticism, 19th-century prose
D. B. Aspinwall, Ph.D.—poetry, 20th-century literature
J. Lusseyran, Lic. es lettres—18th-century literature, theatre
H. Niedzielski, Ph.D.—medieval language and literature, phonetics

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.

Under Plan A degree requirements include 30 hours of course work: a minimum of 21 hours of course work and a maximum of 9 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 and up to 8 credits in related fields.

Under Plan B degree requirements include 30 hours of course work of which a minimum 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, and up to 8 credits in related fields.

### FRENCH

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>407</td>
<td>Introduction to Medieval Language and Literature (3)</td>
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<tr>
<td>408</td>
<td>Masterpieces of Medieval Literature (3)</td>
</tr>
<tr>
<td>410</td>
<td>Masterpieces of 16th-Century Literature (3)</td>
</tr>
<tr>
<td>411-412</td>
<td>Masterpieces of 17th-Century Literature (3-3)</td>
</tr>
<tr>
<td>413</td>
<td>Masterpieces of 18th-Century Literature (3)</td>
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<tr>
<td>415-416</td>
<td>Masterpieces of 19th-Century Literature (2-2)</td>
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<tr>
<td>420</td>
<td>20th-Century French Novel (3)</td>
</tr>
<tr>
<td>421</td>
<td>20th Century French Theatre (3)</td>
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<tr>
<td>422</td>
<td>20th Century French Poetry (3)</td>
</tr>
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<td>491</td>
<td>Seminar in French Literature (3)</td>
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<td>601</td>
<td>Seminar in Contemporary French Literature (3)</td>
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<td>602</td>
<td>Seminar in French Poetry (3)</td>
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<tr>
<td>609</td>
<td>French Renaissance (3)</td>
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<tr>
<td>610</td>
<td>Masterpieces of the Baroque Age (3)</td>
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<tr>
<td>651</td>
<td>Philosophic Currents of the 18th Century (3)</td>
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<td>661</td>
<td>Stylistics (3)</td>
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<td>666</td>
<td>Seminar in History of French Literary Criticism (2)</td>
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<td>671</td>
<td>History of the French Language (3)</td>
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<td>672</td>
<td>Medieval Literature (2)</td>
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<td>681</td>
<td>The Novel in France (3)</td>
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<td>685</td>
<td>Seminar in Realism in French Literature (3)</td>
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<td>690</td>
<td>The Theatre in France (3)</td>
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<td>699</td>
<td>Directed Research (arr.)</td>
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<td>735</td>
<td>Seminar in French Literature (3)</td>
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<td>Thesis Research (arr.)</td>
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### E.L.

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<tr>
<td>610</td>
<td>Contrastive Analysis of French and Spanish with English (3)</td>
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<td>630</td>
<td>Seminar in Research Methods (1)</td>
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### Ed. CI

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<tr>
<td>640</td>
<td>Seminar in Teaching Fields (3)</td>
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</table>
Both an M.S. and Ph.D. 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 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.

The department requires one foreign language for the Ph.D. and uses the Educational Testing Services examinations where available.

The department is considered strong in population genetics and biochemical genetics. Candidates are expected to indicate their main area of interest before acceptance by the department, and are assigned tentatively to their major professor 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 to 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. For human genetics the preparation should include anthropology; for plant genetics the preparation should include cytology, plant anatomy, taxonomy and physiology. The Graduate Record Examination and two letters of recommendation are required of all applicants.

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<th>GENETICS</th>
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<td>452</td>
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</table>
GEOGRAPHY

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)
699  Directed Research (arr.)
800  Thesis Research (arr.)

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
N. M. Bowers, Ph.D.—South Asia, Micronesia, political geography
J. H. Chang, Ph.D.—climatology, China
S. D. Chang, Ph.D.—China, cartography, aerialphoto and image interpretation
W. C. Clarke, Ph.D.—cultural ecology and primitive agricultural systems, New Guinea (on leave 1969-70)
R. J. Earickson, Ph.D.—social and urban geography, theoretical models and quantitative methods
D. W. Fryer, Ph.D.—economic development, Southeast Asia
D. H. Kornhauser, Ph.D.—Japan, urbanization and impacts of technological change (on leave, 1969-70)
C. A. Manchester, Jr., Ph.D.—Japan, history of geographical thought, historical geography
P. N. D. Pirie, Ph.D.—population geography, Pacific
F. R. Pitts, Ph.D.—cultural geography, East Asia, computer applications
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

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 studies of tropical environments (climatology, biogeography, soils geography), man-environment systems, and geographic problems of resource management and economic development (population, migration, urban and regional systems). The regional focus of interest is Asia and the Pacific, including Hawaii. 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
2) two systematic fields
3) a systematic field and mathematical-quantitative applications.
GEOGRAPHY

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).

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.

Incoming students are administered a written examination designed to reveal the quality of their preparation for advanced work. (A suggested reading list is available upon request). On the basis of this exam the adviser will decide if there are subject areas of weakness which are to be remedied by independent reading, or by audit or credit courses.

The department offers both Plan A (thesis) and Plan B (non-thesis) programs. Plan A is the usual program but Plan B may be permitted at the discretion of the department. 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 is expected to 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 subfields 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 690 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 examination; in the case of Plan A candidates the exam will extend to the proposed thesis problem. The Plan A candidate 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 and, in addition, three letters of reference.

The program will consist of advanced courses and research seminars in the department, independent reading and research, and work in related
disciplines. There will be 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.

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

<table>
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<tr>
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<tbody>
<tr>
<td>300</td>
<td>Introduction to Climatology (3)</td>
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<tr>
<td>310</td>
<td>Physical Geography (3)</td>
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<tr>
<td>314</td>
<td>Geography of the Tropics (3)</td>
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<tr>
<td>400</td>
<td>Advanced Climatology (3)</td>
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<td>415</td>
<td>Medical Geography (3)</td>
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<tr>
<td>600</td>
<td>Seminar in Climatology (3)</td>
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Systematic Cultural Geography

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<td>326</td>
<td>Conservation and Utilization of Natural Resources (3)</td>
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<td>330</td>
<td>Population Geography (3)</td>
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<tr>
<td>335</td>
<td>Political Geography (3)</td>
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<tr>
<td>339</td>
<td>Geography of Exploration (3)</td>
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<td>351</td>
<td>Elements of Regional Science (3)</td>
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<td>420</td>
<td>Location Theory and Regional Analysis (3)</td>
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<td>421</td>
<td>Urban Geography (3)</td>
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<tr>
<td>620</td>
<td>Regional Economic Analysis (3)</td>
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</table>

Area Courses

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<th>Course</th>
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<tbody>
<tr>
<td>340</td>
<td>Geography of the United States and Canada (3)</td>
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<tr>
<td>345</td>
<td>Geography of the Soviet Union (3)</td>
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<tr>
<td>352</td>
<td>Geography of Japan (3)</td>
</tr>
<tr>
<td>353</td>
<td>Geography of China (3)</td>
</tr>
<tr>
<td>355</td>
<td>Geography of South Asia (3)</td>
</tr>
</tbody>
</table>
Geosciences

Graduate Faculty

D. C. Cox, Ph.D. (Sub-chairman for Hydrology)—hydrology, groundwater and engineering geology
S. H. Laurila, Ph.D. (Sub-chairman for Geodesy)—geodesy
G. A. Macdonald, Ph.D. (Sub-chairman for Geology)—volcanology, igneous petrology
C. S. Ramage, Sc.D. (Sub-chairman for Meteorology)—tropical meteorology
G. H. Sutton, Ph.D. (Sub-chairman for Solid Earth Geophysics)—seismology, exploration geophysics
A. T. Abbott, Ph.D.—ore deposits, geomorphology
C. W. Adams, M.S.—climatology, physical oceanography
W. M. Adams, Ph.D.—seismology, applied geophysics
J-H. Chang, Ph.D.—climatology
W. C. Chiu, Ph.D.—atmospheric turbulence and oscillations
K. I. Daugherty, M.S.—physical geodesy
P. C. Ekern, Ph.D.—agricultural meteorology, hydrology, erosion
P. F. Fan, Ph.D.—geochemistry and mineralogy of marine sediments, geology of Asia
C. M. Fullerton, Ph.D.—cloud physics
A. S. Furumoto, Ph.D.—seismology, geophysics
G. W. Groves, Ph.D.—hydrodynamics
M. A. Khan, Ph.D.—satellite geodesy, gravity, geophysics
L. S. Lau, Ph.D.—ground and surface water hydrology
A. Malahoff, Ph.D.—geomagnetism, gravity
M. Manghnani, Ph.D.—geochemistry, geophysics
R. M. Moberly, Jr., Ph.D.—sedimentology, marine geology
T. Murakami, D.Sc.—general atmospheric circulation, numerical methods
J. J. Naughton, Ph.D.—geochemistry
K. A. Pankiowskyj, Ph.D.—metamorphic geology, silicate phase petrology
F. L. Peterson, Ph.D.—hydrogeology
J. C. Rose, Ph.D.—gravity, marine geophysics
A. H. Woodcock, D.Sc.—cloud physics
G. P. Wood, Ph.D.—gravity, seismology, geomagnetism
E. J. Workman, Ph.D.—atmospheric electricity, cloud electrification
I-pai Wu, Ph.D.—surface water hydrology
K. Wyrtki, Ph.D.—air-sea interaction

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
S. Price, B.S.—physical meteorology

Degree Requirements (Plan A only)

M.S. A minimum of 18 credit hours of course work and 12 credit hours of thesis research, as well as a reading knowledge of one foreign language with useful scientific literature in the field of the candidate.

Ph.D. A reading mastery of one foreign language with useful scientific literature in the field of the candidate.

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 have taken the equivalent of University of Hawaii offerings in Civil Engineering 111 (Surveying), Civil Engineering 311 (Photogrammetry) and Geography 235 (Map and Airphoto Interpretation) or equivalent knowledge of those topics gained through practical experience. Deficiencies in undergraduate preparation must be made up. As a minimum requirement, he also should have one year of geology and be knowledgeable in general physics and mathematics through calculus. Graduate courses in photogrammetry available at the University of Washington, Seattle, under a co-operative 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.

**Meteorology**

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 geosciences courses, courses may be allowed in the fields of oceanography, physics, and mathematics.

**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.

<table>
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<tr>
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<tr>
<td>799</td>
<td>Directed Research (arr.)</td>
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<td>Thesis Research (arr.)</td>
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<td>Introduction to Geodetic Science (3)</td>
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<td>481</td>
<td>Potential Theory and Gravity (3)</td>
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GEOSCIENCES

482 Elements of Satellite Geodesy and Celestial Mechanics (3)
681-682 Physical Geodesy (3-3)
683 Satellite Geodesy (3)
684 Advanced Geodesy (3)
685 Adjustment Computation (3)
687 Geodetic Astronomy (3)

GEOLOGY

300 Rocks and Minerals (5)
301 Mineralogy (3)
302 Petrology (3)
303 Structural Geology (3)
316 Geomorphology (3)
320 Marine Geology (3)
410 Historical Geology (3)
411 Paleontology (3)
412 Micropaleontology (3)
415 Regional Geology (2)
424 Advanced Mineralogy (5)
425 Geochemistry (2)
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 (arr.)
617-618 Seminar in Geotectonics (3)
619-620 Sedimentology and Stratigraphy (3-3)
624 Topics in Geochemistry (3)
625 Seminar in Current Research Topics (arr.)

HYDROLOGY

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

METEOROLOGY

639 Meteorology of the Tropical Oceans (2)
640 Advanced Tropical Meteorology Laboratory (3)
641 Monsoon Meteorology (3)
642 Atmospheric Turbulence (3)
643 Cloud Physics (3)
644 Physical Meteorology (3)
646 Statistical Meteorology (3)
745 Numerical Analysis and Prediction (5)
750 Advanced Theoretical Meteorology I (3)
751 Advanced Theoretical Meteorology II (3)
752 Special Topics in Meteorology (3)
765 Seminar in Meteorology (1)

SOLID EARTH GEOPHYSICS

351 Seismology (3)
360 Principles of Geophysics (3)
463 Physical Properties of Earth Matter (3)
465-466 Geophysical Exploration (3-3)
German

Graduate Faculty

R. Seymour, Ph.D. (Chairman)—Germanic linguistics

D. Dauer, Ph.D.—18th- and 19th-century German literature and philosophy

G. Fröhlich, Ph.D.—19th- and 20th-century literature

A. Moore, M.A.—linguistics and stylistics

W. Scherer, Ph.D.—Medieval, Reformation and Baroque literature

Plan A (thesis) and Plan B (non-thesis) 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 examination will be administered to determine the student’s program and objectives. By September 30 the candidate 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 defense of thesis complete the degree. Plan B (non-thesis) 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. Comprehensive examinations, together with a seminar appearance after presentation of a paper, complete the degree.
History

Graduate Faculty

W. F. Vella, Ph.D. (Department Chairman)—Southeast Asia, Thailand
A. W. Saville, Ph.D. (Chairman, Graduate Faculty)—modern Europe, Germany
G. Akita, Ph.D.—Far East, modern Japan
E. D. Beecher, Ph.D.—United States economic
C. B. Cowing, Ph.D.—United States social and economic
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
H. F. Margulies, Ph.D.—United States political, the Progressive Era
W. H. Maurer, Ph.D.—ancient Near East, Greece and Rome
J. M. McCutcheon, Ph.D.—United States cultural and social
T. D. Murphy, Ph.D.—British Commonwealth, the Pacific
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
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
R. Van Niel, Ph.D.—Southeast Asia, Indonesia
R. A. Wade, Ph.D.—Russian intellectual
J. A. White, Ph.D.—Russia, Russia in Asia
Visiting Faculty
J. G. de Casparis, Ph.D.—ancient Southeast Asia-Indonesia
C. W. Newbury, Ph.D.—French Oceania

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 (non-thesis) 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 601 and 602), and 6 semester hours of thesis research. Plan B requires a minimum of 30 hours of graduate course work (at least 18 in courses numbered 600 to 799, including History 601 and 602) and comprehensive examinations in two fields of history. 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. 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 601 and 602.

Courses available for the graduate program are listed below.

**Asia**

**HISTORY**

401–402 History of South Asia
405–406 History of Southeast Asia
409–410 History of China
411–412 Social and Political History of Modern China
413–414 History of Japan
415–416 Imperial and Feudal Institutions of Traditional Japan
417–418 History of Korea
654 Seminar in Mainland Southeast Asian History
655 Seminar in Island Southeast Asian History
661 Seminar in Chinese History
663 Seminar in Indian History
   (1) Ancient India
   (2) South India
   (3) Muslim India
   (4) Modern South Asia
665 Seminar in Japanese History
667 Seminar in Korean History
701 Research Materials and Methods in Asian History
713–714 Chinese Historical Literature
717–718 Chinese Intellectual History
721–722 China from Classical Antiquity to 750
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
HISTORY

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

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 Russia and Soviet Foreign Policy
453-454 Intellectual History of Russia and the Soviet Union
455-456 European Intellectual History
459 Constitutional History of England
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
601 Seminar in Historical Method
602 Seminar in Historiography
799 Directed Research
800 Thesis Research
HORTICULTURE

Horticulture

Graduate Faculty
D. P. Watson, Ph.D. (Chairman)—ornamentals
J. L. Brewbaker, Ph.D.—radiation genetics
R. A. Criley, Ph.D.—floriculture, ornamentals
J. C. Gilbert, Ph.D.—vegetable breeding
R. A. Hamilton, Ph.D.—tropical fruit improvement
R. W. Hartmann, Ph.D.—plant breeding and genetics
H. Kamemoto, Ph.D.—ornamental cytogenetics
H. Y. Nakasone, Ph.D.—tropical fruit breeding
R. R. Romanowski, Ph.D.—crop physiology
Y. Sagawa, Ph.D.—developmental morphology and cytogenetics
R. M. Warner, Ph.D.—tropical fruit ecology

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

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. Deficiencies must be made up.

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

453 Principles of Plant Breeding (3)
450 Tropical Horticultural Crop Production (4)
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 (arr.)
711 Special Topics in Experimental Horticulture (arr.)
800 Thesis Research (arr.)
Information Sciences

Graduate Faculty

N. Abramson, Ph.D. (Chairman)—information theory and coding; computer nets
J. B. Ferguson, Ph.D.—business systems analysis
N. T. Gaarder, Ph.D.—communication theory
R. H. Jones, Ph.D.—statistical information processing
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
E. Mookini, Ph.D.—numerical analysis
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
T. Rodgers, Ph.D.—psycholinguistics; computer-aided instruction
J. Seidler, Ph.D., (visiting)—communication theory; pattern recognition
L. Wallen, Ph.D.—mathematics of communications
S. Watanabe, Ph.D.—pattern recognition

The information sciences M.S. program is intended to serve both the student who is interested in a career in information sciences and the student who expects to use information 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 business, engineering, mathematics, or science should consult with the program chairman before applying for admission. The minimum requirements for admission to the program follow:

1. A working knowledge of some general programming language such as FORTRAN.
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 of the background courses listed below must either be included in the M.S. program or in the student's previous college work. 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. In exceptional cases, the student's program committee may approve other courses which fit in with the student's educational objectives.
3. In any case, the program must be approved by the student's program committee.

If Plan A is chosen, the student must earn at least 12 credits in courses numbered 600 or above. The thesis receives 12 credits toward the degree. If Plan B is chosen, a minimum of 18 credits must be earned in courses numbered 600 or above. In either case, a total of 30 credits is required.
Under either Plan A or Plan B, the student must pass a general examination given during his first semester. In addition, under Plan B, the student shall make a seminar appearance at least three weeks before the end of the term during which the degree is conferred.

**Background Courses**

<table>
<thead>
<tr>
<th>INFORMATION PROCESSING MACHINES—AREA 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISc 461 Digital Techniques (3)</td>
</tr>
<tr>
<td>ISc 466 Computer Organization &amp; Programming Techniques (3)</td>
</tr>
<tr>
<td>ISc 467 Algorithmic Languages (3)</td>
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<table>
<thead>
<tr>
<th>LOGICAL ANALYSIS—AREA 2</th>
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<tbody>
<tr>
<td>Phil 445 Symbolic Logic I (3)</td>
</tr>
<tr>
<td>ISc 661 Theory of Automata (3)</td>
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<tr>
<td>ISc 693 Special Topics in Information Sciences (3)</td>
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<table>
<thead>
<tr>
<th>PROBABILISTIC ANALYSIS—AREA 3</th>
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<tbody>
<tr>
<td>ISc 443 Statistical Data Analysis (3)</td>
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<tr>
<td>ISc 446 Information Theory (3)</td>
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<tr>
<td>ISc 613 Linear Systems Analysis (3)</td>
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<td>ISc 641 Discrete Stochastic Process (3)</td>
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<td>ISc 648 Theory of Inference (3)</td>
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**Elective Courses**

<table>
<thead>
<tr>
<th>BUSINESS ANALYSIS AND STATISTICS</th>
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<tbody>
<tr>
<td>780 Statistical Decision Theory (3)</td>
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<tr>
<td>781 Operations Research (3)</td>
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<tr>
<td>782 Quantitative Methods of Business and Economic Forecasting (3)</td>
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<tr>
<th>ECONOMICS</th>
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<tbody>
<tr>
<td>605 Mathematical Economics</td>
</tr>
<tr>
<td>624 Advanced Econometrics I (3)</td>
</tr>
<tr>
<td>626 Advanced Econometrics II (3)</td>
</tr>
<tr>
<td>627 Economic Programming (3)</td>
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<thead>
<tr>
<th>ELECTRICAL ENGINEERING</th>
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</thead>
<tbody>
<tr>
<td>462 Digital Techniques Laboratory (1)</td>
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<tr>
<td>614 Analysis of Nonlinear Systems (3)</td>
</tr>
<tr>
<td>646 Signal and Noise Theory (3)</td>
</tr>
<tr>
<td>647 Applied Statistical Decision Theory (3)</td>
</tr>
<tr>
<td>648 Error-Correcting Codes (3)</td>
</tr>
<tr>
<td>651 Advanced Feedback Control Systems (3)</td>
</tr>
<tr>
<td>652 Optimization Techniques in Control Systems (3)</td>
</tr>
<tr>
<td>653 Adaptive Control (3)</td>
</tr>
<tr>
<td>654 Concepts of Digital System Control (3)</td>
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<tr>
<td>655 Sampled-Data Control Systems (3)</td>
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<tr>
<td>657 Hybrid Automatic Control Systems (3)</td>
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<thead>
<tr>
<th>GENERAL ENGINEERING</th>
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<tbody>
<tr>
<td>451 Engineering Analysis (3)</td>
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<tr>
<th>GENETICS</th>
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<tbody>
<tr>
<td>650 Population Genetics (3)</td>
</tr>
<tr>
<td>660 Statistical Methodology in Genetics (3)</td>
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</tbody>
</table>

112
GEOGRAPHY
680 Advanced Quantitative Methods in Geography (3)
685 Computer Applications in Geography (3)

GEODESY
683 Satellite Geodesy (3)
685 Adjustment Computation (3)

LIBRARY STUDIES
660 Science and Technology Literature (3)
662 Business and Economic Literature (3)
670 Literature Searching and Documentation (3)

LINGUISTICS
650-651 Advanced Linguistic Analysis (3–3)

MATHEMATICS
402 Differential Equations (3)
406 Difference Methods for Differential Equations (3)
412 Abstract Algebra (3)
472 Statistical Inference (3)
611-612 Modern Algebra (3–3)

METEOROLOGY
646 Statistical Meteorology (3)
745 Numerical Analysis and Prediction (5)

PHILOSOPHY
611 Symbolic Logic II (3)
715 Philosophy of Mathematics (3)

PSYCHOLOGY
606 Multivariate Methods (3)
607 Introduction to Mathematical Models (3)
635 Sensory Processes and Psychophysics (3)
644 Mathematical Models (3)

SOCIOLOGY
715 Seminar in Social Statistics (3)
716 Seminar in Theory Construction (3)

Library Studies

Faculty
R. D. Stevens, Ph.D. (Dean)—administration, government documents
I. W. Harris, Ph.D. (Assistant Dean)—reference, reader services
M. W. Ayrault, M.S. in L.S.—cataloging
V. Crozier, B.S. in L.S.—science-technology
C. Dang, M.S. in L.S.—building library collections
R. W. DeAngelo, M.S. in L.S.—children's literature, reference
E. Ferguson, B.S. in L.S.—special libraries
J. R. Hunt, M.A. in L.S.—administration
A. Kamida, M.L.S.—cataloging
R. Kane, M.L.S.—reference and bibliography
D. C. McAlister, B.Ed., B.S. in L.S.—cataloging
LIBRARY STUDIES

D. W. McNeil, M.S. in L.S.—building library collections
J. L. Nolan, B.S. in L.S.—reference and bibliography
G. R. Nunn, Ph.D.—Asian reference and administration
S. Saito, M.L.S.—reference and bibliography
Y. Suzuki, M.L.S.—administration, Far Eastern collections
M. Tsui, M.L.S.—reference
S. Vann, Ph.D.—social functions, management
S. L. West, B.S. in L.S.—reference, building library collections
J. Wheelwright, M.S. in L.S.—business and economics
J. Wright, M.L.S.—reference and bibliography

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. Field experience, on a non-credit basis, will be available to persons interested in first-hand contact with children, young adult, and adult services.

### LIBRARY STUDIES CORE CURRICULUM

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>601</td>
<td>Bibliography and Reference Sources (3)</td>
<td></td>
</tr>
<tr>
<td>602</td>
<td>Advanced Reference Sources (3)</td>
<td></td>
</tr>
<tr>
<td>605</td>
<td>Basic Cataloging and Classification (3)</td>
<td></td>
</tr>
<tr>
<td>610</td>
<td>Social Functions of Libraries (3)</td>
<td></td>
</tr>
<tr>
<td>615</td>
<td>Building Library Collections (3)</td>
<td></td>
</tr>
<tr>
<td>647</td>
<td>Management of Library Operations (3)</td>
<td></td>
</tr>
<tr>
<td>650</td>
<td>Administration of Libraries (3)</td>
<td></td>
</tr>
<tr>
<td>678</td>
<td>Reader Services (3)</td>
<td></td>
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</tbody>
</table>

### ELECTIVES

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>606</td>
<td>Advanced Cataloging and Classification (3)</td>
<td></td>
</tr>
<tr>
<td>618</td>
<td>Government Documents (3)</td>
<td></td>
</tr>
<tr>
<td>642</td>
<td>Audio-Visual Services in Libraries (3)</td>
<td></td>
</tr>
<tr>
<td>660</td>
<td>Science and Technology Literature (3)</td>
<td></td>
</tr>
<tr>
<td>662</td>
<td>Business and Economic Literature (3)</td>
<td></td>
</tr>
<tr>
<td>664</td>
<td>Abstracting and Indexing for Information Services (3)</td>
<td></td>
</tr>
<tr>
<td>665</td>
<td>Special Libraries (3)</td>
<td></td>
</tr>
<tr>
<td>670</td>
<td>Literature Searching and Documentation (3)</td>
<td></td>
</tr>
<tr>
<td>681</td>
<td>Reading Materials for Children (3)</td>
<td></td>
</tr>
<tr>
<td>682</td>
<td>Reading Materials for Youth (3)</td>
<td></td>
</tr>
<tr>
<td>683</td>
<td>Service for Children and Young People (3)</td>
<td></td>
</tr>
<tr>
<td>698</td>
<td>Field Seminar (during last term in the School) (3)</td>
<td></td>
</tr>
<tr>
<td>701</td>
<td>Administration of Libraries in Asia (3)</td>
<td></td>
</tr>
<tr>
<td>705</td>
<td>Asian Reference Sources (3)</td>
<td></td>
</tr>
<tr>
<td>706</td>
<td>Technical Services for Far Eastern Collections (3)</td>
<td></td>
</tr>
<tr>
<td>715</td>
<td>Seminar in Library Development (3)</td>
<td></td>
</tr>
</tbody>
</table>

School Librarians: The basic program for school library work is identical with the above—the following courses are the normal electives for school librarians:
For those who have not had practice teaching, the following course may be required:

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 a 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)—descriptive and applied linguistics, Micronesian languages

C.-J. N. Babey, Ph.D.—theoretical and comparative linguistics

S. H. Elbert, Ph.D.—comparative and historical linguistics, Hawaiian, other Polynesian, and Micronesian languages

G. W. Grace, Ph.D.—theoretical, comparative, and historical linguistics, ethnolinguistics, Austronesian languages

F. K. Li, Ph.D.—Chinese and Tai linguistics, other Sino-Tibetan languages, North American Indian linguistics

H. P. McKaughan, Ph.D.—descriptive and theoretical linguistics, Philippine and Papuan languages

G. J. Parker, Ph.D.—descriptive and comparative linguistics, Quechua, Andean languages, Melanesian languages

A. J. Schütz, Ph.D.—descriptive linguistics, field methods, Fijian, other Melanesian, and Polynesian languages

S. Starosta, Ph.D.—theoretical linguistics, Asian and Pacific languages

L. C. Thompson, Ph.D.—historical and comparative linguistics, field methods, North American Indian linguistics and 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

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.

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 lin-
LINGUISTICS
guistic theory, language contact and dialectology, and ethnolinguistics.

Departmental Requirements

In addition to the following departmental requirements the require­ments of the Graduate Division are also applicable.

A core of courses (410, 421, 422, 621, 622, 630, 645) is required of all advanced degree candidates who have not had equivalents elsewhere. All students are also required to take at least one advanced seminar.

M.A.

The department offers both Plan A and Plan B programs. Besides the general requirements of the Graduate Division, both of these programs require that the student demonstrate competence in one language other than his native language. The choice of language must be approved by the graduate faculty in linguistics, and the examination must be passed at least one full semester before the candidate takes his final examination.

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.

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

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. Furthermore, one of the language examinations must satisfy the language requirements established by the Graduate Division. Both languages must be approved by the graduate faculty in linguistics. Students are admitted to candidacy after demonstrating competence in both languages and performing successfully on the comprehensive examination.

The doctoral candidate is expected also to have one or more minor fields of study selected in consultation with his advisors. Suggested fields include anthropology, Asian and Pacific languages, English, European languages, mathematics, philosophy, and psychology.

The courses of the department (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 designed to provide the stu-
dent with a sound 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 directed research.

LINGUISTICS

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>320</td>
<td>General Linguistics (3)</td>
</tr>
<tr>
<td>410</td>
<td>Articulatory Phonetics (3)</td>
</tr>
<tr>
<td>421</td>
<td>Introduction to Phonological Analysis (3)</td>
</tr>
<tr>
<td>422</td>
<td>Introduction to Grammatical Analysis (3)</td>
</tr>
<tr>
<td>611</td>
<td>Acoustic Phonetics (3)</td>
</tr>
<tr>
<td>615</td>
<td>The Nature of Language (3)</td>
</tr>
<tr>
<td>621</td>
<td>Phonology (3)</td>
</tr>
<tr>
<td>622</td>
<td>Grammar (3)</td>
</tr>
<tr>
<td>625</td>
<td>Mathematical Properties of Natural Languages (3)</td>
</tr>
<tr>
<td>630</td>
<td>Field Methods (3)</td>
</tr>
<tr>
<td>645</td>
<td>Introduction to Comparative Method (3)</td>
</tr>
<tr>
<td>650-651</td>
<td>Advanced Linguistic Analysis (3-3)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research (arr.)</td>
</tr>
<tr>
<td>750</td>
<td>Seminar (3)</td>
</tr>
<tr>
<td>760</td>
<td>Problems in Comparison and Pre-History (3)</td>
</tr>
<tr>
<td>770</td>
<td>Areal Linguistics (3)</td>
</tr>
<tr>
<td>780</td>
<td>Ethnolinguistics (3)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis or Dissertation Research (arr.)</td>
</tr>
</tbody>
</table>

Mathematics

**Graduate Faculty**

- E. H. Mookini, Ph.D.—analysis
- C. Gregory, Ph.D.—applied mathematics
- E. Groth, Ph.D.—applied mathematics
- A. Mader, Ph.D.—group theory
- N. Nobusawa, Ph.D.—algebra
- K. Rogers, Ph.D.—algebra, number theory
- L. J. Wallen, Ph.D.—analysis
- C. Weinbaum, Ph.D.—algebra
- Z. Z. Yeh, Ph.D.—analysis

Intended candidates must present a minimum preparation of differential and integral calculus, differential equations, linear algebra, advanced calculus, and modern algebra. In addition to the examinations prescribed by the Graduate Division, candidates for the M.A. must pass a written comprehensive examination in their last semester. This comprehensive examination covers the area of algebra, complex and real analysis.
Courses available for the graduate program are listed below. Courses may also be allowed in appropriate related fields.

**MATHEMATICS**

- 402 Differential Equations (3)
- 403-404 Methods in Higher Analysis (3—3)
- 406 Difference Methods for Differential Equations (3)
- 420 Introduction to the Theory of Numbers (3)
- 441 Numerical Analysis (3)
- 442 Vector Analysis (3)
- 444 Functions of a Complex Variable (3)
- 471 Probability (3)
- 472 Statistical Inference (3)
- 611-612 Modern Algebra (3—3)
- 621-622 Topology (3—3)
- 631-632 Functions of a Real Variable (3—3)
- 644-645 Analytic Function Theory (3—3)
- 649 Topics in Mathematics (3)
- 750 Seminar (1)
- 799 Directed Research (arr.)
- 800 Thesis Research (arr.)

**Mechanical Engineering**

**Graduate Faculty**

- J. C. Burgess, Ph.D.—mechanics; acoustics
- J. C. S. Chou, Ph.D.—environmental engineering; energy conversion
- R. M. Fond, 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. H. Klhara, Ph.D.—thermodynamics; fluid mechanics
- J. Larsen-Badse, Ph.D.—materials science; corrosion
- W. Stulver, Ph.D.—mechanics; space dynamics

The department offers programs leading to the M.S. in mechanical engineering with areas of specialization in the thermosciences (e.g., heat transfer, mass transfer, thermodynamics, fluid mechanics, gas dynamics, energy conversion) and in mechanics and materials (e.g., continuum mechanics, space mechanics, rheology, properties of materials, corrosion). A third broad area of specialization, systems and design, is currently being developed. The department offers both Plan A (thesis) and Plan B (non-thesis).

Graduate students in mechanical engineering are given wide latitude in formulating their programs of study. The department places no requirements on the student’s program other than the following: it must fulfill Graduate Division requirements, and it must meet the approval of the student’s thesis/program committee. Each student is encouraged to include in his program courses from outside the department which con-
tribute toward a cohesive and clear educational plan having mechanical engineering as its central focus.

Applicants for admission to study must present a B.S. degree or its equivalent in engineering or science. Applicants for graduate assistantships must have the results of the Aptitude and Advanced Engineering Tests of the Graduate Record Examination sent to the department chairman before the application can be considered. Others are strongly urged to have the results of the Aptitude and appropriate Advanced test sent to the department chairman. Choice of Plan A or Plan B and identification of an interim adviser are required before the general examination will be given. The nature of the general examination is determined by the interim adviser after conference with the intended candidate.

Candidates must present 30 credit hours for the M.S. degree. Candidates are expected to attend all department seminars. Those electing Plan A are required to register for a total of 8 credit hours of ME 800 and to present an acceptable thesis. 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.

Mechanical engineering courses acceptable toward the M.S. degree are identified in the following list:

**MECHANICAL ENGINEERING**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>422</td>
<td>Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>424</td>
<td>Introduction to Gas Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>431</td>
<td>Electronic Processes in Materials</td>
<td>3</td>
</tr>
<tr>
<td>433</td>
<td>Failures in Materials</td>
<td>2</td>
</tr>
<tr>
<td>441</td>
<td>Thermal Material Processing</td>
<td>3</td>
</tr>
<tr>
<td>451</td>
<td>Automatic Control</td>
<td>3</td>
</tr>
<tr>
<td>455</td>
<td>Nuclear Power Engineering</td>
<td>3</td>
</tr>
<tr>
<td>471</td>
<td>Fundamentals of Space Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>473</td>
<td>Mechanical Vibration and Shock</td>
<td>3</td>
</tr>
<tr>
<td>474</td>
<td>Fundamentals of Acoustics</td>
<td>3</td>
</tr>
<tr>
<td>496</td>
<td>Mechanical Engineering Topics</td>
<td>arr.</td>
</tr>
<tr>
<td>611</td>
<td>Classical Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>612</td>
<td>Statistical Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>621</td>
<td>Conduction Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>622</td>
<td>Convection Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>623</td>
<td>Radiation Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>624</td>
<td>Gasdynamics</td>
<td>3</td>
</tr>
<tr>
<td>626</td>
<td>Viscous and Turbulent Flows</td>
<td>3</td>
</tr>
<tr>
<td>628</td>
<td>Theory and Measurement of Turbulence</td>
<td>3</td>
</tr>
<tr>
<td>630</td>
<td>Materials Science Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>631</td>
<td>Mechanical Properties of Materials</td>
<td>3</td>
</tr>
<tr>
<td>635</td>
<td>Corrosion Theory</td>
<td>3</td>
</tr>
<tr>
<td>636</td>
<td>Materials for the Ocean Environment</td>
<td>2</td>
</tr>
<tr>
<td>671</td>
<td>Mechanics of Continua I</td>
<td>3</td>
</tr>
<tr>
<td>672</td>
<td>Mechanics of Continua II</td>
<td>3</td>
</tr>
<tr>
<td>696</td>
<td>Advanced Topics in Mechanical Engineering</td>
<td>arr.</td>
</tr>
<tr>
<td>697</td>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td>699</td>
<td>Directed Reading or Research</td>
<td>arr.</td>
</tr>
<tr>
<td>800</td>
<td>Thesis</td>
<td>arr.</td>
</tr>
</tbody>
</table>
Microbiology

Graduate Faculty
A. A. Benedict, Ph.D. (Chairman)—immunochemistry
P. Baumann, Ph.D.—general microbiology
L. R. Berger, Ph.D.—general microbiology and microbial physiology
O. A. Bushnell, Ph.D.—medical bacteriology
G. W. Chu, Sc.D.—host-parasite relationships
D. E. Contois, Ph.D.—general microbiology and microbial physiology
C. E. Folsome, Ph.D.—microbial genetics
H. A. Frank, Ph.D.—food microbiology
K. R. Gundersen, Ph.D.—marine microbiology
J. B. Hall, Ph.D.—comparative biochemistry and virology
M. Herzberg, Ph.D.—host-parasite relationships and immunology
P. C. Loh, Ph.D.—virology
B. Z. Siegel, Ph.D.—comparative biochemistry

Affiliate Faculty
L. Rosen, Ph.D.—virology

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; and developmental and cell biology. 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 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

431 Microbial Biochemistry and Function (4)
461 Immunology (4)
463 Microbiology of the Pathogens (4)
475 Microbial Genetics (4)
480 Microbial Ecology (4)
490 Virology (4)
Music

Graduate Faculty

A. Russell, A.M.D., (Chairman)—music composition
M. Kerr, M.M.—music performance, piano
R. N. McKay, Ph.D.—music composition
T. Miller, A.M.D.—music education
L. Rowell, Ph.D.—music theory
B. B. Smith, M.M.—ethnomusicology
R. Vaught, Ph.D.—musicology
R. W. Vine, M.M.—music performance, voice
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, and in music education. 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.

Applicants should 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 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 and musicology follow the thesis plan only (Plan A). Concentration in performance follows the non-thesis program only (Plan B). Plan A requires 20 hours of course work and 10 hours of thesis. Plan B requires 30 hours of course work. For concentration in musicology a reading knowledge of French or German is required. For other concentrations a foreign language or languages appropriate to the field of thesis research or performance may be required as determined by the supervising committee. Candidates concentrating in music education may choose between the thesis program and the non-thesis program. Requirements for the Hawaii State Department of Education Professional Certificate may be met in the M.A. program in music education.

Courses available for the graduate program are listed below.

MUSIC

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>401</td>
<td>Ensemble (1)</td>
</tr>
<tr>
<td>402</td>
<td>University Concert Choir (1)</td>
</tr>
<tr>
<td>404</td>
<td>Opera Workshop (3)</td>
</tr>
<tr>
<td>405</td>
<td>University Symphony Orchestra (1)</td>
</tr>
<tr>
<td>409</td>
<td>University Concert Band (1)</td>
</tr>
<tr>
<td>420</td>
<td>Music Literature Laboratory (2)</td>
</tr>
<tr>
<td>430</td>
<td>Advanced Applied Music (arr.)</td>
</tr>
<tr>
<td>451</td>
<td>Advanced String Methods (2)</td>
</tr>
<tr>
<td>452</td>
<td>Advanced Woodwind Methods (2)</td>
</tr>
<tr>
<td>453</td>
<td>Advanced Brass Methods (2)</td>
</tr>
<tr>
<td>455</td>
<td>Advanced Percussion Methods (2)</td>
</tr>
<tr>
<td>457</td>
<td>Pacific and Asian Music in Education (2)</td>
</tr>
<tr>
<td>458</td>
<td>Voice Methods (2)</td>
</tr>
<tr>
<td>459</td>
<td>Piano Methods (2)</td>
</tr>
<tr>
<td>461</td>
<td>Symphonic Music (2)</td>
</tr>
<tr>
<td>462</td>
<td>Choral Music (2)</td>
</tr>
<tr>
<td>463</td>
<td>Opera (2)</td>
</tr>
<tr>
<td>464</td>
<td>Twentieth Century Music (2)</td>
</tr>
<tr>
<td>469</td>
<td>Keyboard Music (2)</td>
</tr>
<tr>
<td>470</td>
<td>Art Music of Asia (2)</td>
</tr>
<tr>
<td>471</td>
<td>Music of Non-Literate Peoples (3)</td>
</tr>
<tr>
<td>481-482</td>
<td>Advanced Orchestration (2-2)</td>
</tr>
<tr>
<td>483-484</td>
<td>Counterpoint (2-2)</td>
</tr>
<tr>
<td>485-486</td>
<td>Form and Analysis (2-2)</td>
</tr>
<tr>
<td>487-488</td>
<td>Composition (2-2)</td>
</tr>
<tr>
<td>489-490</td>
<td>Advanced Composition (2-2)</td>
</tr>
<tr>
<td>491-492</td>
<td>Movement Notation (2-2)</td>
</tr>
</tbody>
</table>
600 Seminar (3)
   (1) composition (4) performance repertory
   (2) ethnomusicology (5) music education
   (3) musicology (6) dance ethnology

601 Advanced Ensemble (1)

625-626 Advanced Conducting (2-2)

635 Graduate-Level Applied Music (arr.)

636 Graduate Recital (3)

651 Foundations in Music Education (2)

652 Problems in Music Education (2)

660 Studies in Music Literature (2)

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 (arr.)

800 Thesis Research (arr.)

*Credit not available to candidates for a graduate degree in composition.
†Credit not available to candidates for a graduate degree in musicology.

Nursing

Graduate Faculty

E. Anderson, Ph.D. (Dean)—nursing practice theory and curriculum
L. Bermosk, M. Litt. (Chairman)—mental health-psychiatric nursing
G. Felton, Ed.D.—nursing in biophysical pathology
Y. Gross, M.S.—community health nursing
M. Olson, Ph.D.—nursing research and social psychology
S. Scheiner, Ph.D.—psychological anthropology and social anthropology

The program extends over four semesters and leads to a master of science degree. Under Plan B (non-thesis), a minimum of 35 semester hours must include: (1) one research course; (2) one advanced nursing seminar and practicum; (3) a minimum of 18 credit hours in nursing; (4) 24 credit hours in courses numbered 600 and above; and (5) study in related cognate fields.

In addition to requirements for admission to the Graduate Division, the applicant must present evidence of: (1) a baccalaureate degree with a major in nursing from an accredited institution whose program is substantially equivalent to that given at the University of Hawaii; (2) completion of a course in elementary statistics; (3) licensure in Hawaii for the practice of nursing; and (4) official scores of the aptitude test of the Graduate Record Examination and of the Miller Analogies Test.
A general examination for admission to candidacy is given in the final week of the first semester. It is designed to review the student's progress and to determine the student's ability to undertake graduate study in the selected area of specialization. Upon admission to candidacy, a program adviser is selected from the graduate faculty in the selected area of specialization. A final examination, required of all Plan B candidates, is scheduled four weeks before the end of the semester during which the degree will be conferred. The exam will be conducted by a special departmental committee which includes the student's program adviser.

There are four main elements in the graduate curriculum: nursing practice theory, nursing research, nursing concepts and cognate courses from related fields.

Areas of specialization are offered in the following: (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. (3) Administration of Organized Nursing Services, which focuses on the preparation of nurses for supervisory and administrative leadership in organized nursing services. (4) Nursing in Biophysical Pathology, which prepares a clinical specialist to function with patients who have medical and surgical conditions requiring hospital care and associated institutional services.

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

### COURSES REQUIRED OF ALL MAJORS

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>600-601</td>
<td>Methods of Research (3–3) or</td>
</tr>
<tr>
<td>602</td>
<td>Orientation to Nursing Research (3)</td>
</tr>
<tr>
<td>607</td>
<td>Nursing Practice Theory (3)</td>
</tr>
</tbody>
</table>

### COURSES TO FULFILL REQUIREMENTS OF THE AREAS OF SPECIALIZATION

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>610</td>
<td>Curriculum Development (3)</td>
</tr>
<tr>
<td>611</td>
<td>Socio-cultural Influences on Health and Health Services (3)</td>
</tr>
<tr>
<td>615</td>
<td>Interaction Processes (3)</td>
</tr>
<tr>
<td>617</td>
<td>Nursing in Biophysical Pathology (3)</td>
</tr>
<tr>
<td>621</td>
<td>Concepts of Leadership in Nursing (3)</td>
</tr>
<tr>
<td>625</td>
<td>Advanced Nursing Concepts I (3)</td>
</tr>
<tr>
<td></td>
<td>A. Mental Health-Psychiatric Nursing</td>
</tr>
<tr>
<td></td>
<td>B. Community Health Nursing</td>
</tr>
<tr>
<td></td>
<td>C. Administration of Organized Nursing Services</td>
</tr>
<tr>
<td></td>
<td>D. Biophysical Pathology</td>
</tr>
<tr>
<td>627</td>
<td>Advanced Nursing Concepts II (3)</td>
</tr>
<tr>
<td></td>
<td>A. Mental Health-Psychiatric Nursing</td>
</tr>
<tr>
<td></td>
<td>B. Community Health Nursing</td>
</tr>
<tr>
<td></td>
<td>C. Administration of Organized Nursing Services</td>
</tr>
<tr>
<td></td>
<td>D. Biophysical Pathology</td>
</tr>
<tr>
<td>630</td>
<td>Advanced Nursing Seminar (2)</td>
</tr>
<tr>
<td></td>
<td>A. Mental Health-Psychiatric Nursing</td>
</tr>
</tbody>
</table>
Nutritional Sciences

Graduate Faculty
J. R. Beaton, Ph.D. (Chairman)—energy, environmental nutrition, endocrinology
A. R. Doberenz, Ph.D.—minerals, calcified tissue
D. M. Hilker, Ph.D.—carbohydrate metabolism, enzymology
F. Konishi, Ph.D.—obesity, allergy, nutritional status
I. J. Lichton, Ph.D.—fluids and electrolytes, endocrinology
B. R. Standal, Ph.D.—protein, lipid metabolism
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. Required courses are marked with an asterisk.

NUTRITION

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>676</td>
<td>Nutritional and Metabolic Diseases (2)</td>
</tr>
<tr>
<td>677</td>
<td>Nutrition in Reproduction, Growth and Development (3)</td>
</tr>
<tr>
<td>678</td>
<td>Nutrition in Aging (2)</td>
</tr>
<tr>
<td>680</td>
<td>Research Methods in Nutrition (3)</td>
</tr>
<tr>
<td>*681</td>
<td>Seminar (1)</td>
</tr>
<tr>
<td>682</td>
<td>Nutritional Status (3)</td>
</tr>
<tr>
<td>684</td>
<td>Lipids in Health and Disease (2)</td>
</tr>
<tr>
<td>*685—686</td>
<td>Advanced Human Nutrition (1—1)</td>
</tr>
<tr>
<td>*699</td>
<td>Directed Readings and Research (2)</td>
</tr>
<tr>
<td>*800</td>
<td>Thesis (10)</td>
</tr>
</tbody>
</table>

COGNATES

IS or BA  Theory of Administration (3)
PH       Public Health Organization and Administration (3)
PH       Principles of Epidemiology (2)
Phys     Advanced Physiology (3)
Psy      Advanced Physiological Psychology (3)
Psy or Soc Group Dynamics (3)
The master of science in ocean engineering is an interdepartmental graduate program contributed to by the departments of oceanography, civil engineering, electrical engineering, and mechanical engineering. Intended candidates for the master of science in ocean engineering must present a B.S. in civil, chemical, electrical or mechanical engineering or the equivalent. Plan A (thesis program) is recommended, but Plan B (non-thesis) may be permitted. Choice of plan must be made before 14 credits of graduate work applicable to the degree have been completed. Foreign language is not required.

Plan A requires a minimum total of 30 credit hours, including 22 credit hours of course work and 8 credit hours of thesis research. 6 credit hours of course work may be taken outside the College of Engineering and the department of oceanography. At least 8 credits must be in engineering courses. Two graduate seminars in engineering or in oceanography are required. A minimum of 18 credits must be in courses numbered 600–799.

Plan B requires 30 credits of course work. At least 6 credits must be taken outside of the undergraduate field of specialization. At least 8 credits must be in engineering courses. Two graduate seminars in engineering or oceanography are required. A minimum of 18 credits must be in courses numbered 600–799.

The following courses are required of all students in ocean engineering:

OE 411 Naval Hydrostatics (3)
OE 603 Ocean Engineering Environment (3)
OE 609 Principles of Ocean Engineering (3)
Ocn 620 Physical Oceanography (3)
In addition, it is recommended that they take

OE 601 Ocean Engineering Laboratory (3)
OE 696 Topics in Ocean Engineering (2)

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
412 Naval Hydrodynamics I (3)
610 Viscous Fluid Dynamics (3)
611-612 Naval Hydrodynamics II & III (3–3)
614 Ocean Hydrodynamics Laboratory (2)
631-632 Design of Ocean Structures I & II (3–3)
661-662 Coastal and Harbor Engineering (3–3)
671 Submarine Vehicle Naval Architecture (3)
697-698 Seminar in Ocean Engineering (1–1)
707-708 Statistical Dynamics of Ocean Systems I & II (3–3)

CIVIL ENGINEERING
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)
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)

ECONOMICS
698 Marine Resources (3)

ELECTRICAL ENGINEERING
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
443 Statistical Data Analysis (3)
641 Discrete State Stochastic Processes (3)
648 Theory of Inference (3)
650 Time Series Analysis (3)
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. Preparation in one foreign language is strongly recommended as one is required for the Ph.D.

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.

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### OCEANOGRAPHY

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>622</td>
<td>Geological Oceanography (3)</td>
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<tr>
<td>623</td>
<td>Chemical Oceanography (2)</td>
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<tr>
<td>632</td>
<td>Littoral Geological Processes (3)</td>
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<td>640</td>
<td>Advanced Physical Oceanography (3)</td>
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<tr>
<td>642</td>
<td>Recent Marine Sediments (3)</td>
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<tr>
<td>660</td>
<td>Ocean Wave Theory (3)</td>
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<tr>
<td>661</td>
<td>Tides (3)</td>
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</tbody>
</table>

### Oceanography

**Graduate Faculty**
- G. I. Murphy, Ph.D. (Chairman)—biological
- J. E. Andrews, Ph.D.—geological
- V. E. Brock, M.A.—biological
- J. Caperon, Ph.D.—biological
- K. E. Chave, Ph.D.—chemical
- T. A. Clarke, Ph.D.—quantitative ecology
- R. I. Clutter, Ph.D.—biological
- D. C. Gordon, Ph.D.—chemical ecology
- G. W. Groves, Ph.D.—physical
- A. Malahoff, Ph.D.—geological
- K. Wyrtki, Ph.D.—physical

**Affiliate Faculty**
- R. Barkley, Ph.D.—physical
- J. C. Marr, M.A.—biological
- C. R. Seckel, M.S.—physical
Students pursuing a degree program must take the following courses or their equivalents: Ocn 620; 621; 622; 623.

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**

<table>
<thead>
<tr>
<th>Course</th>
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<td>Biological Oceanography (3)</td>
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<td>Chemical Oceanography Laboratory Methods (1)</td>
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<td>636</td>
<td>Phytoplankton Ecology (2)</td>
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<td>Zooplankton Ecology Laboratory (2)</td>
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<td>Tides (3)</td>
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<td>662</td>
<td>Marine Hydrodynamics (3)</td>
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<td>663</td>
<td>Measurements and Instrumentation (2)</td>
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<td>Ocean Basins (3)</td>
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<td>673</td>
<td>Continental Shelves (3)</td>
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<td>750</td>
<td>Topics in Biological Oceanography (2)</td>
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<td>760</td>
<td>Topics in Physical Oceanography (2)</td>
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<td>770</td>
<td>Seminar in Chemical Oceanography (1)</td>
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<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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</table>

**Pacific Islands Studies**

**Graduate Faculty**

- N. Meller, Ph.D. (Director)—political science
- H. Cox, M.A.—art
- T. Ihara, Ph.D.—education
- D. Johnson, Ph.D.—history
- E. A. Kay, Ph.D.—general science
- C. Ramage, D. Sc.—geosciences
- E. Ross, Ph.D.—food science
- E. Voulgaropoulos, M.Ph., M.D.—public health

Intended candidates for the M.A. in Pacific Islands studies must have an undergraduate background of 18 hours of credit (or the equivalent)
PACIFIC ISLANDS STUDIES

dealing with the Pacific Islands area in such fields as the following: anthropology, art, geography, history, linguistics, literature, music, political science, and sociology. The program requires a basic course in anthropology, geography or history of the Pacific Islands. Candidates are urged to have a reading knowledge of French, German, Hawaiian, Japanese, or Spanish and to utilize the language in thesis research. (Prerequisites may be satisfied by course work while enrolled at the University, prior to admission to candidacy.)

Courses are to be selected from those listed below in such manner as to provide an integrated program bearing upon a particular concentration of interest. At least three departments must be represented. In valid instances, courses pertinent to the Pacific Islands in other fields, such as chemistry, microbiology, and nutrition, may be substituted. (Courses marked with an asterisk may but do not necessarily focus on the Pacific, and the instructor should be consulted before enrolling.)

AGRICULTURAL ECONOMICS
625 Economics of Agriculture: Tropical Countries and Asia (3)*
638 Land Use in Developing Countries (3)*
639 Agricultural Development Economics and Development Planning (3)*

ANTHROPOLOGY
450 Regional Cultures of Oceania (3)
   (1) Hawaii
   (2) Micronesia
   (3) Polynesia
   (4) Melanesia
460 Regional Archaeology (3)
   (1) Asia and the Pacific
699 Directed Research (arr.)
750 Research Seminar (3)*

ARCHITECTURE
621 Seminar on Tropical Architecture (2)*
640 Architecture and Planning in Tropical Areas (4)*

ART
475 Arts of the Pacific (3)
675 Arts of Hawaii (3)
676 Arts of Indonesia and Melanesia

ENGLISH
480 Literature of the Pacific (3)
482 Narratives of Oral Tradition (3)*
675 Literary Genres and Problems (3)*
799 Directed Research (arr.)

GEOGRAPHY
665 Seminar in Geography of the Pacific (3)
799 Directed Research (arr.)

HISTORY
421 Australia and New Zealand (3)

130
MUSIC
401 Ensembles (1)
(78) Oceanic Ensemble
(98) Oceanic Dance
457 Pacific and Asian Music in Education (2)
471 Music of Non-literate Peoples (3)*
600 Seminar (in Ethnomusicology) (3)*
670 Regional Music (3)
(2) Oceania
699 Directed Research (arr.)

PACIFIC ISLANDS
699 Directed Research (arr.)
800 Thesis Research (arr.)

POLITICAL SCIENCE
640 Comparative Government and Politics (3)*
699 Directed Research (arr.)
740 Seminar: Comparative Government and Politics (3)*

PSYCHOLOGY
665 Cross-Cultural Psychology (3)*
699 Directed Research (arr.)

PUBLIC HEALTH
664 Infectious Diseases of Man in the Pacific (3)

SOCIOLOGY
430 Race Relations in the Pacific (3)
722 Seminar in Group Relations (3)*
799 Directed Research (arr.)

SPEECH-COMMUNICATION
499 Special Problems (arr.)*
784 Seminar in Intercultural Communications (3)*

ZOOLOGY-BOTANY
450 Natural History of the Hawaiian Islands (2)

Pharmacology

Graduate Faculty
B. K. B. Lum, M.D. (Chairman)—receptor theory
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
The department of pharmacology offers the requisite work for medical students, and also both 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 course work adapted to the needs of the particular student as determined by the major professor and the thesis committee. Most students will be expected to take graduate courses in biochemistry, microbiology, and genetics. Courses in pathology and clinical medicine will be recommended for some students.

**PHARMACOLOGY**

600 Pharmacology: Actions and Uses of Drugs (5)
610 Marine Pharmacology (1)
613–614 Seminar in Pharmacology (1)
615 Toxicology (4)
617 Bioassay (4)
619 Experimental Pharmacodynamics (3)
699 Directed Research (arr.)
800 Thesis Research (arr.)

**Philosophy**

**Graduate Faculty**

W. E. Nagley, Ph.D. (Chairman)—philosophy of religion, existential philosophy
A. Borgmann, Ph.D.—metaphysics, phenomenology, philosophy of language
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
H. E. McCarthy, Ph.D.—history of philosophy, philosophy of art, philosophy and literature

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.
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.

M.A. candidates must demonstrate proficiency in a foreign language (i.e., a language other than English) which the department approves. Reading competence in two foreign languages, selected to accord with the area of dissertation research, are required of each Western Ph.D. degree candidate. In the case of the Asian or Comparative Ph.D. candidate, reading competence in one Asian language in the special area of research is required.

### Western

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<th>PHILOSOPHY</th>
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<td>Social Philosophy (3)</td>
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<tr>
<td>405</td>
<td>American Philosophy (3)</td>
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<tr>
<td>410</td>
<td>Philosophy of the Physical Sciences (3)</td>
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<tr>
<td>415</td>
<td>Philosophy of the Social Sciences (3)</td>
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<td>417</td>
<td>Theory of Knowledge (3)</td>
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<td>420</td>
<td>Philosophy of Art (3)</td>
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<tr>
<td>422</td>
<td>Philosophy and Psychoanalysis (3)</td>
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<td>425</td>
<td>Philosophy in Literature (3)</td>
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<td>427</td>
<td>Kafka (3)</td>
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<td>430</td>
<td>Existential Philosophy (3)</td>
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<td>435</td>
<td>Philosophy of Religion (3)</td>
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<td>445</td>
<td>Symbolic Logic I (3)</td>
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<td>600</td>
<td>Problems of Philosophy (3)</td>
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<td>604</td>
<td>Metaphysics of Language (3)</td>
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<td>611</td>
<td>Symbolic Logic II (3)</td>
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<td>700</td>
<td>Individual Western Philosophers (3)</td>
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<tr>
<td>715</td>
<td>Philosophy of Mathematics (3)</td>
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<tr>
<td>720</td>
<td>Seminar in Ancient-Medieval Philosophy (3)</td>
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<td>725</td>
<td>Seminar in Modern Classical Philosophy (3)</td>
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<tr>
<td>730</td>
<td>Seminar in Contemporary Philosophy (3)</td>
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<td>740</td>
<td>Seminar in Philosophy of Science (3)</td>
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### Asian and Comparative

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<table>
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<tbody>
<tr>
<td>450</td>
<td>Indian Philosophy (3)</td>
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<td>460</td>
<td>Buddhist Philosophy (3)</td>
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<td>470</td>
<td>Chinese Philosophy (3)</td>
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<td>480</td>
<td>Philosophy, East and West (3)</td>
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<tr>
<td>485</td>
<td>Modern Japanese Philosophy (3)</td>
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</tbody>
</table>
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 and the Physics tests of the Graduate Record Examination must be submitted prior to admission.

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

440  Solid State Physics (3)
490  Quantum Electronics (3)
*600  Methods of Theoretical Physics I (3)
601  Methods of Theoretical Physics II (3)
*605  Modern Physics Laboratory I (1 or 2)
606  Modern Physics Laboratory II (1 or 2)
*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 (arr.)
800  Thesis Research (arr.)

Physiology

Graduate Faculty
T. A. Rogers, Ph.D. (Chairman)—environmental physiology
S. Batkin, M.D.—neurophysiology
M. L. Brown, Ph.D.—physiology in nutrition
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. Lichton, Ph.D.—endocrinology, fluid balance
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, cardiovascular physiology
P. B. van Weel, Ph.D.—physiological ecology

Affiliate Faculty
C. F. Aquadro, M.D.—diving, hyperbarism

Intended candidates for the M.S. or Ph.D. in physiology must have or acquire adequate preparation in biology, chemistry, physics, and mathematics.
PLANT PATHOLOGY

The course work required of candidates includes basic courses in related sciences, or demonstrated competency 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.

PHYSIOLOGY

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<tr>
<th>Course Code</th>
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<tr>
<td>602</td>
<td>Medical Physiology (6)</td>
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<td>603-604</td>
<td>Seminar in Physiology (1−1)</td>
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<tr>
<td>605</td>
<td>Physiology of Nerve and Muscle (3)</td>
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<tr>
<td>606</td>
<td>Comparative Physiology of Thermoregulation (3)</td>
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<td>607</td>
<td>Physiological Adaptation to the Environment (2)</td>
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<td>608</td>
<td>Advanced Renal Physiology (2)</td>
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<td>699</td>
<td>Directed Research (arr.)</td>
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<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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</tbody>
</table>

Plant Pathology

Graduate Faculty

I. W. Buddenhagen, Ph.D. (Chairman)—bacterial diseases, post-harvest diseases
M. Aragaki, Ph.D.—fungal physiology, disease resistance, disease control
O. V. Holtzmann, Ph.D.—nematology, general plant pathology
J. E. Hunter, Ph.D.—virology, general plant pathology
M. Ishii, Ph.D.—virology
W. H. Ko, Ph.D.—soil-borne diseases
A. H. McCain, Ph.D.—chemical disease control
D. S. Meredith, Ph.D.—epidemiology of plant diseases
S. Patil, Ph.D.—host-parasite physiology
E. E. Trujillo, Ph.D.—soil-borne fungal diseases

Affiliate Faculty

W. J. Apt, Ph.D.—nematology, pineapple diseases
K. G. Rohrbach, Ph.D.—pineapple diseases
C. A. Wismer, Ph.D.—diseases of sugar cane

Intended candidates for the M.S. in plant pathology must present a minimum of 18 hours of undergraduate credit in agricultural plant sciences, botany, or entomology. The undergraduate program should also include two years of chemistry, one year of physics, one year of mathematics, and basic courses in bacteriology, economics, English composition, scientific writing, genetics, soils, and zoology.

Both Plan A and Plan B are available. Plan B is designed for those students who do not intend to make plant pathological research their profession. In this program at least 9 credits of work in courses numbered 600−799 shall be earned in the major field. Six credits must be earned in directed research in the major field. Students may change from Plan A to Plan B only with the approval of the graduate faculty.
Courses available for the graduate program are listed below. In addition, selected courses from agronomy, biochemistry, botany, chemistry, entomology, genetics, horticulture, microbiology, soil science, zoology, and related disciplines may be approved to fit the needs of individual candidates.

Dissertation research in plant pathology may be conducted by Ph.D. students in botany, entomology, horticulture, and related fields.

**PLANT PATHOLOGY**

- 601 Tropical Plant Pathology (3)
- 605 Clinical Plant Pathology (2)
- 610 Principles of Plant Disease Control (3)
- 615 Plant Nematology (3)
- 620 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 (arr.)
- 705 Host-Parasite Physiology (3)
- 800 Thesis Research (arr.)

**Political Science**

**Graduate Faculty**

- H. J. Friedman, Ph.D. (Chairman)—comparative administration, comparative politics
- L. Alschuler, Ph.D.—comparative politics, political development
- S. T. Appleton, Ph.D.—international relations, Chinese politics
- T. Becker, Ph.D.—judicial process, political theory
- R. S. Cahill, Ph.D.—politics, political theory
- J. Dator, Ph.D.—Japanese politics, political futures
- M. N. Goldstein, Ph.D.—political theory, politics
- M. Haas, Ph.D.—international relations, political development
- H. S. Kariel, Ph.D.—political theory
- 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
- 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. Rohrer, Ph.D.—political psychology, racial ideologies
- R. J. Rummel, Ph.D.—international relations, systems theory
- M. J. Shapiro, Ph.D.—political theory, legislative behavior
- R. B. Stauffer, Ph.D.—comparative politics, political development
- D. Tabb, Ph.D.—politics, political theory
- J. Wilson, Ph.D.—biopolitics, political theory

Intended candidates for the master's degree will select a thesis or non-thesis 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.

**Systems of Political Thought**

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<th>Course</th>
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<td>Scope and Methods of Political Science</td>
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<tr>
<td>601</td>
<td>Political Analysis, Theory Building and Techniques</td>
<td>3</td>
</tr>
<tr>
<td>602</td>
<td>Research Practicum</td>
<td>3</td>
</tr>
<tr>
<td>610</td>
<td>Political Thought</td>
<td>3</td>
</tr>
<tr>
<td>*710</td>
<td>Seminar: Political Thought</td>
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**Decision Making**

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<td>American Government</td>
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<td>650</td>
<td>Public Administration Theory</td>
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<td>651</td>
<td>Functional Aspects of Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>660</td>
<td>Public Law and Judicial Systems</td>
<td>3</td>
</tr>
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<td>670</td>
<td>Politics</td>
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<tr>
<td>*720</td>
<td>Seminar: American Government</td>
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<tr>
<td>*750</td>
<td>Seminar: Public Administration</td>
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<td>*760</td>
<td>Seminar: Judicial Systems</td>
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<td>*770</td>
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**Political Development**

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<tr>
<td>640</td>
<td>Comparative Government and Politics</td>
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<tr>
<td>650</td>
<td>Public Administration Theory</td>
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<td>660</td>
<td>Public Law and Judicial Systems</td>
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<td>670</td>
<td>Politics</td>
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<tr>
<td>*740</td>
<td>Seminar: Comparative Government and Politics</td>
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<td>*750</td>
<td>Seminar: Public Administration</td>
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<td>*760</td>
<td>Seminar: Judicial Systems</td>
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<td>Seminar: Politics</td>
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**International Relations**

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>630</td>
<td>International Relations</td>
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</table>
Intended candidates for graduate degrees must present 18 hours of undergraduate work in psychology, including general and experimental psychology and statistics.

Programs leading to the Ph.D. are available in four fields of specialization: experimental, developmental, social-personality, clinical. Applicants interested in further information should write to the chairman directly.

Intended candidates for the Ph.D. may, under special circumstances, offer 24 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

PSYCHOLOGY

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)

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 Experimental Method 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)
760 Research in Personality (3)
762 Research in Social Psychology (3)
**Clinical Psychology**

- Behavior Assessment (2–2)
- Behavior Assessment Laboratory (1–1)
- Childhood Behavior Disorders and Intervention (3)
- Adult Behavior Disorders and Intervention (3)
- Social Behavior Disorders and Intervention (3)
- Child Learning Laboratory (3–3)
- Practicum in Behavior Change: Community Issues (3)
- Practicum in Behavior Change in Children (3)
- Practicum in Behavior Change in Adults (3)
- Child Learning Laboratory (3–3)
- Practicum in Clinical Psychology (arr.)
- Research in Clinical Psychology (3)
- Internship (0–0)

**Other**

- Directed Research (arr.)
- 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

- Thesis, Dissertation Research (arr.)

**Public Health**

**Graduate Faculty**

- E. O'Rourke, M.D., M.P.H. (Dean)—public health administration
- R. W. Armstrong, Ph.D., M.P.H.—comprehensive health planning
- N. C. Burbank, Jr., Sc.D.—environmental health and sanitary engineering
- C. S. Chung, Ph.D.—biostatistics
- E. W. Clark, M.P.H.—public health education
- A. Connor, M.D., M.P.H.—maternal and child health
- 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., M.P.H.—epidemiology
- S. Furuno, M.S.P.M., Ph.D.—mental retardation
- F. I. Gilbert, Jr., M.D.—community medicine
- J. Grossman, M.P.H., Ph.D.—public health education
- J. H. Hankin, M.S., Dr.P.H.—public health nutrition
- R. K. C. Lee, M.D., Dr.P.H. (Dean Emeritus)—public health administration
- Y. S. Matsumoto, Ph.D.—population and family planning studies
- R. E. Mytinger, Dr.P.H.—health services administration
- C. B. Park, M.D., Dr.P.H.—biostatistics
- R. R. Sachs, M.D., M.P.H.—public health administration
- A. D. Schwartz, M.D., M.P.H.—mental health
- R. G. Smith, M.D., M.P.H.—maternal and child health
- R. Y. Suehiro, M.P.H.—international health
- E. Voulgaropoulos, M.D., M.P.H.—international health
The School of Public Health, accredited in 1965, offers programs leading to the M.P.H. and M.S. degrees.

M.P.H.

The M.P.H. program (Plan B) 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 present at least a bachelor's degree in a discipline appropriate to his chosen area of public health in which he plans to be employed. Depending on the student's background and interest, an appropriate course of study is prescribed, incorporating the student's selected area of emphasis. Candidates must complete a minimum of 30 semester hours, including 6 semester hours of required courses (marked with an asterisk below) and suitable field training. Students are required to pass a general diagnostic examination on public health before formal admission to candidacy and must pass a final oral seminar near the completion of the program.

Traditionally, M.P.H. candidates have been physicians, dentists, veterinarians or other personnel in the health or related professions with at least three years of experience; for these, the program may be completed in 12 months. The M.P.H. program at the University of Hawaii is open not only to such experienced personnel but also to students with a bachelor's degree or to students with a graduate degree in a health-related science. For students with only baccalaureate degrees and no previous work experience in the health professions, they are limited to only certain areas of emphasis, and they usually require from 16 to 21 months to complete their programs. (Refer to Public Health Bulletin.)

M.S.

The M.S. program is open to persons with at least a bachelor's degree in any of the several sciences basic to public health and who desire research training in some specific aspect of public health. Both Plan A and Plan B are available. Both plans (1) ordinarily require two years to complete, (2) require the passing of a general examination on public health before formal admission to candidacy, (3) require the completion of 11 semester hours of required courses (identical courses required in the M.P.H. program), and (4) may require some form of appropriate short-
term field work. In Plan A the minimum requirement is 24 semester hours plus 6 credits for thesis research, and a final oral examination on the thesis and related subjects; in Plan B the minimum requirement is 30 semester hours and a final seminar appearance.

Areas of Emphasis

Several areas of emphasis in the broad field of public health are offered in the M.P.H. and M.S. (Plans A and B) programs. Areas include biostatistics, comprehensive health planning, environmental sanitation, epidemiology, health services administration, international health, maternal and child health, mental health, mental retardation, population and family planning studies, public health administration, public health education, public health engineering, public health laboratory, and public health nutrition.

Courses are to be selected from those listed below, and, with approval, others in the related fields suitable for each individual student.

PUBLIC HEALTH

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>602</td>
<td>Seminar in Medical Care Organization (2)</td>
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<tr>
<td>603</td>
<td>Organization of Medical Care Systems (3)</td>
</tr>
<tr>
<td>604</td>
<td>Institutional Health Care Facilities (3)</td>
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<tr>
<td>605</td>
<td>Non-Institutional Health Care Facilities (2)</td>
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<tr>
<td>606</td>
<td>Economics for Health Administrators (3)</td>
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<tr>
<td>607</td>
<td>Seminar in Health Services Administration (1)</td>
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<tr>
<td>*609-610</td>
<td>Public Health Organization and Administration (3–3)</td>
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<td>611</td>
<td>Information Systems for Comprehensive Health Planning (2)</td>
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<td>612</td>
<td>Health Aspects of Physical Planning and Community Design (2)</td>
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<td>613</td>
<td>Seminar in Comprehensive Health Planning (2)</td>
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<td>616</td>
<td>Basic Concepts of International Health (3)</td>
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<td>617</td>
<td>Comparative Public Health Systems (3)</td>
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<td>618</td>
<td>Seminar in International Health (2)</td>
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<td>624</td>
<td>Community Mental Health (2)</td>
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<td>629</td>
<td>Dental Public Health (2)</td>
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<td>631</td>
<td>Public Health Nutrition I (2)</td>
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<tr>
<td>632</td>
<td>Public Health Nutrition II (2)</td>
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<tr>
<td>633</td>
<td>Seminar in Public Health Nutrition (1)</td>
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<tr>
<td>636</td>
<td>Medical Aspects of Disability (3)</td>
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<tr>
<td>642</td>
<td>Maternal and Child Health I (2)</td>
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<tr>
<td>643</td>
<td>Maternal and Child Health II (2)</td>
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<td>644</td>
<td>The Handicapped Child (2)</td>
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<td>645</td>
<td>Principles of Comprehensive Maternity Care (2)</td>
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<td>646</td>
<td>Health Services for the Mentally Retarded (2)</td>
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<td>649</td>
<td>Family Planning in Theory and Practice (2)</td>
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<td>650</td>
<td>Demography and World Population Problems (3)</td>
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<td>651</td>
<td>Fertility and Reproduction (2)</td>
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<td>652</td>
<td>Staff Seminar in Population Dynamics (2)</td>
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<td>655</td>
<td>Public Health Statistics (3)</td>
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<td>656</td>
<td>Biostatistics (3)</td>
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<td>Statistical Analysis (3)</td>
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<td>658</td>
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<td>663</td>
<td>Principles of Epidemiology (2)</td>
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<tr>
<td>664</td>
<td>Infectious Diseases of Man in the Pacific Area (3)</td>
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</table>
SECONDARY EDUCATION

665 Public Health Aspects of Chronic Diseases (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)
696 Principles of Community Medicine (2)
700 Management of Health Services (3)
701 Planning and Control of Health Services (4)
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 Preventive Medicine (1)
791 Advanced Public Health Practice in (Area of Emphasis) (3)
792 Seminar in Public Health (1–5)
799 Directed Research in (Area of Emphasis) (arr.)
800 Thesis Research (arr.)

Secondary Education

Graduate Faculty

R. S. Alm, Ph.D. (Chairman)—English education, reading
F. B. Brown, Ed.D.—secondary education, curriculum
E. F. Chui, Ph.D.—physical education
J. N. Fultz, Ed.D.—social studies education
A. W. S. In, Ph.D.—secondary education
R. M. Martin, Ph.D.—secondary education, supervision, curriculum
J. D. Morris, Ed.D.—business education
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.—physical education
N. Whitman, Ph.D.—mathematics education

Intended candidates for the M.Ed. must present successful academic performance in the areas of societal and psychological foundations of education, 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 (non-thesis) 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 708, 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).

CURRICULUM AND INSTRUCTION

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<tbody>
<tr>
<td>419</td>
<td>The Business Education Curriculum (3)</td>
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<td>460</td>
<td>Distributive Education (3)</td>
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<td>634</td>
<td>Extraclass Activities in Secondary Schools (2)</td>
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<td>635</td>
<td>Junior High School Curriculum (3)</td>
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<td>636</td>
<td>Secondary School Curriculum (3)</td>
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<td>637</td>
<td>Art in Secondary Education (3)</td>
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<td>640</td>
<td>Seminar in Teaching Fields (3)</td>
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<td>646</td>
<td>Reading Difficulties (3)</td>
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<td>647</td>
<td>Clinical Procedures in Reading (3)</td>
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<td>699</td>
<td>Directed Research (arr.)</td>
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<tr>
<td>733</td>
<td>Seminar in Curriculum (3)</td>
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<tr>
<td>737</td>
<td>Foundations in Art Education (3)</td>
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<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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</tbody>
</table>

* Required if "related field of study" in M.Ed. program is a commonly taught subject in public schools.

Social Work

Graduate Faculty

H. H. Aptekar, D.S.W. (Dean)
M. Chung, M.S.W.—field instruction
R. Fisher, M.S.S.A.—group work
N. M. Hartman, M.A.—casework, supervision, field instruction
H. A. Jambor, D.S.W.—social welfare policy and services, community organization, research
K. Kumabe, M.S.W.—casework, research
F. C. Merritt, M.S.W.—human behavior, research
B. Polemis, Ph.D.—research
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 10 credits (750 clock hours) of 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 services, human behavior in the social environment, and social work methods. 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

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<td>628</td>
<td>Social Services (2)</td>
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<td>653</td>
<td>Legal Aspects of Social Work (2)</td>
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<td>656</td>
<td>Social Welfare Organization and Administration (2)</td>
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<tr>
<td>780</td>
<td>Administrative Methods in Social Work</td>
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<td>781</td>
<td>Seminar in Social Welfare Policy (2)</td>
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<td>785</td>
<td>Methods of Supervision in Social Work (2)</td>
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### Human Behavior in the Social Environment

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<tr>
<td>610–611</td>
<td>Human Behavior and Social Environment (3–3)</td>
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<tr>
<td>775</td>
<td>Advanced Social Psychiatry (2)</td>
</tr>
<tr>
<td>790</td>
<td>Cultural Factors in Social Work Practice (2)</td>
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</table>

### Social Work Methods

(All methods courses require concurrent field practice)

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<tr>
<td>605–606</td>
<td>Social Casework (2–2), or</td>
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<tr>
<td>608–609</td>
<td>Social Group Work (2–2)</td>
</tr>
<tr>
<td>615</td>
<td>Community Organization (2)</td>
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<tr>
<td>660–661</td>
<td>Supervised Field Work (3–3)</td>
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<tr>
<td>760–761</td>
<td>Advanced Supervised Field Work (4–4)</td>
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<tr>
<td>765</td>
<td>Advanced Social Casework (2)</td>
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<td>766</td>
<td>Seminar in Social Casework (2)</td>
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<tr>
<td>770</td>
<td>Advanced Social Group Work (2)</td>
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<td>771</td>
<td>Seminar in Social Group Work (2)</td>
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<tr>
<td>777</td>
<td>Community Development in Social Work (2)</td>
</tr>
<tr>
<td>787</td>
<td>Current Practice in Community Organization (2)</td>
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</tbody>
</table>
Sociology

Graduate Faculty

D. S. Yamamura, Ph.D. (Chairman)—ecology and demography, methodology
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
C. K. Cheng, Ph.D.—social institutions, family
L. J. Cho, Ph.D.—demography
L. Freeman, Ph.D.—mathematical sociology, general theory
C. E. Glick, Ph.D.—race relations, collective behavior and social movements
B. L. Hormann, Ph.D.—changing folk and peasant societies, sociology of religion
G. G. Kassebaum, Ph.D.—criminology, comparative research
R. E. Sakumoto, Ph.D.—urban sociology, social deviancy
T. Wittermans, Ph.D.—social change, sociology of religion
G. Won, Ph.D.—industrial sociology, urban sociology
G. K. Yamamoto, M.A.—occupations and professions, comparative institutions—Japan

M.A.

Intended candidates should present an adequate undergraduate preparation in sociology. Applicants with undergraduate majors other than sociology are welcome, but background deficiencies are to be overcome during the first year. Prior to admission, applicants must submit official Graduate Record Examination (GRE) scores on the General Aptitude Tests and Advanced Test in Sociology. Someone without a sociology degree may apply if he wishes by submitting in addition the GRE Advanced Test in his field of undergraduate major.

Each student must complete a set of four "core" courses (610–611, 612 and 613) with a grade of "B" or better in each course. These courses are normally taken in the first year of graduate work. An undergraduate course in elementary statistics is a prerequisite for entrance to Sociology 610–611. (A course in elementary statistics is offered during the second summer session at the University of Hawaii, for the benefit of those students who may wish to meet this requirement before the regular session begins.) The "core" courses provide common training in the classical traditions of sociology, current concepts and propositions, philosophy of science, theoretical methodology, research procedures and data analysis. Students with serious deficiencies in theory, methodology or statistics may be required to postpone these courses until the second semester or second year of graduate work.
Plan A (thesis): Students must earn a minimum of 30 credit hours distributed as follows: graduate core — 12; sociology seminars at the 700 level in two separate fields exclusive of theory and methods — 6; completion of thesis—6; electives (may be in another department) — 6. A maximum of 2 credits toward the degree will be allowed in Directed Research or Directed Reading courses.

Plan B (non-thesis): Students must earn a minimum of 36 credit hours distributed as follows: graduate core—12; sociology seminars at the 700 level in two major fields exclusive of theory and methods—12; courses of seminars outside the field of sociology—6; electives (may be within or outside the field of sociology) —6. A seminar paper will be submitted in lieu of thesis.

All M.A. degree seeking students will be examined orally at least three weeks prior to the end of the term in which the degree is to be conferred. This examination, attended by all committee members and open to all faculty members, will cover the thesis or seminar paper and all other material considered pertinent by members of the committee.

Ph.D.

An M.A. is prerequisite to admission to the program of studies at the doctoral level. In addition applicants must submit official GRE scores on the General Aptitude Tests and the Advanced Test in Sociology, letters of recommendation, and evidence of having completed sociological research.

Each Ph.D. candidate must take at least one advanced seminar in sociological methods or statistics (714 or 715), demonstrate proficiency in one foreign language through an examination administered by the Educational Testing Service, pass comprehensive examinations (three four-hour written examinations in theory and method, and two specialties), make an original contribution to the field through his dissertation, and make an oral defense of the dissertation.

It is intended that no student be awarded the Ph.D. degree simply because he has successfully completed a program of course work; rather he must show himself to be an independent scholar. Each program of study will be tailored individually to meet the interests and needs of the student, and the requirements of his doctoral committee.

Courses available for credit in the graduate program are listed below.

**SOCILOGY**

410 Population and Society (3)
415 The Agrarian Community (3)
416 The Urban Community (3)
425 People and Institutions of China (3)
Spanish

Graduate Faculty

E. C. Knowlton, Jr., Ph.D. (Chairman)—history of the language, Hispano-Philippine literature
S. Baciu, 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

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, peninsular 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
SPANISH

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.

SPANISH

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>403-404</td>
<td>Advanced Oral Practice</td>
<td>3-3</td>
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<tr>
<td>405</td>
<td>Spanish-English Translation</td>
<td>3</td>
</tr>
<tr>
<td>*431</td>
<td>Structure of Spanish</td>
<td>3</td>
</tr>
<tr>
<td>441</td>
<td>History of the Spanish Language</td>
<td>3</td>
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<td>465-466</td>
<td>Modern and Contemporary Spanish Literature</td>
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<td>470</td>
<td>Social and Political Ideas of 20th Century Latin America</td>
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<td>Spanish American Prose</td>
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<td>*625-626</td>
<td>Stylistics and Advanced Composition</td>
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<td>665</td>
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HISTORY

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LINGUISTICS

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<td>Introduction to Phonological Analysis</td>
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EUROPEAN LANGUAGES

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<td>Comparative Romance Linguistics</td>
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<td>Seminar in Teaching Fields: Foreign Language</td>
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<td>521</td>
<td>Geography of Europe</td>
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Speech-Communication

Graduate Faculty

R. L. Rider, Ph.D. (Chairman)—radio and television, international communication
E. J. Bilsborrow, Ph.D.—public speaking, speech education, semantics
L. N. Breneman, M.A.—interpretation
B. H. Byers, Ed.D.—speech education
G. Dykstra, Ph.D.—language performance theory, first and second language development, theory and practice in learning programs
H. W. Ellingsworth, Ph.D.—interpersonal communication, communication and innovation, history of research
L. S. Harms, Ph.D.—intercultural speech-communication, communication systems
P. Heinberg, Ph.D.—speech-communication behavior modification, scientific methods
D. W. Klopf, Ph.D.—forensics, debate, small group communication
V. K. Larson, M.A.—speech education, speech improvement, choral speaking
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 baccalaureate 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. Applicants whose backgrounds are deficient for the successful pursuit of the M.A. degree may be required to strengthen certain areas. Both Plan A (thesis) and Plan B (non-thesis) are available. Both programs require the following: Completion of Speech-Communication 601 and 602; 6 credit hours of graduate work in a related field outside the department; a written general examination during the first semester of graduate work; an oral examination near the end of the program. Under Plan A, the thesis will count 6 semester hours. At least 12 semester hours, excluding S-C 602, must be in courses numbered above 600. Not more than 2 semester hours may be taken in directed research, S-C 799. Under Plan B, at least 18 semester hours must be in courses numbered above 600.

Speech-Communication

304 Speech-Communication Characteristics of the Source (3)
305 Language in Speech-Communication Behavior (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 (var.)
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)
Speech Pathology and Audiology

Graduate Faculty

M. Ansberry, Ph.D. (Chairman)—speech pathology, audiology
S. Batkin, M.D.—speech science
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 27 undergraduate semester credits in the area including basic courses in speech correction, methodology, pathology of speech, audiology, testing of hearing, speech and hearing science, practicum in both speech pathology and audiology, and phonetics. In addition, a minimum of 9 credits in psychology including courses in developmental psychology and psychology of adjustment is required. Deficiencies in undergraduate preparation will be determined by evaluation of transcripts and examination. These must be removed by enrollment in basic courses which will not carry graduate credit.

Two programs are offered for graduate study: Plan A, thesis; and Plan B, non-thesis. 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. 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 sessions.

Specialized courses offered at the graduate level are:

**SPEECH PATHOLOGY AND AUDIOLOGY (SPA)**

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<td>610</td>
<td>Organic Disorders of Speech (3)</td>
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<td>611</td>
<td>Auditory Training and Speech Reading (3)</td>
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<td>612</td>
<td>Functional Disorders of Speech (3)</td>
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<td>613</td>
<td>Language Development for Children with Hearing Deficiencies (3)</td>
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<td>701</td>
<td>Advanced Audiology (3)</td>
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<td>710</td>
<td>Advanced Practicum in Speech Pathology</td>
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<td>Section 1: General Clinical (3)</td>
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<td>Section 2: Public School (6)</td>
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<td>711</td>
<td>Advanced Practicum in Audiology</td>
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<td>Section 1: General Clinical (3)</td>
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<td>Section 2: Public School (6)</td>
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<td>720</td>
<td>Seminar in Speech Pathology</td>
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<td>Section 1: Diagnostic Procedures (3)</td>
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<td>Section 2: Functional Disorders (3)</td>
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<td>Section 3: Organic Disorders (3)</td>
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<td>721</td>
<td>Seminar in Audiology</td>
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<td>Section 1: Diagnostic Procedures (3)</td>
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<td>Section 2: Rehabilitation (3)</td>
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<td>799</td>
<td>Research (Required for Plan B Program)</td>
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<td>Section 1: Speech Pathology (1-4)</td>
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<td>Section 2: Audiology (1-4)</td>
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<tr>
<td>800</td>
<td>Thesis Research (Required for Plan A Program)</td>
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<td>Section 1: Speech Pathology (8)</td>
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<td>Section 2: Audiology (8)</td>
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**Teaching English as a Second Language**

*Graduate Faculty*

B. W. Bender, Ph.D.—Micronesian languages and linguistics; applied linguistics

R. H. Crymes, Ph.D.—English grammar; methods and materials in teaching English as a second language

G. Dykstra, Ph.D.—linguistics and learning programs

P. J. Heinberg, Ph.D.—automated instruction; experimental phonetics.

M. P. Lester, Ph.D.—English grammar; linguistic theory

C. W. Mason, Ph.D.—teaching English as a second language; applied linguistics

T. H. Plaister, M.A.—teaching English as a second language; testing second language learning; reading instruction

T. S. Rodgers, Ph.D.—psycholinguistics; English curriculum materials development; educational psychology

H. M. Schaafisma, M.A.—linguistics; applied linguistics; second language teaching

The M.A. program in teaching English as a second language (TESL) is designed to prepare specialists in this field, particularly related to Asia
TEACHING ENGLISH AS SECOND LANGUAGE

and the Pacific Basin. Available both to American and foreign graduate students, this is a 36 credit, non-thesis program which includes coursework in general and applied linguistics, the structure and phonology of English, and methods and materials for TESL.

Students in this program are expected to have taken undergraduate coursework in American and/or British literature. Those having little or no such background may be required to take one or more undergraduate literature courses without credit toward the degree.

In addition to the general requirements of the Graduate Division, TESL program requirements include: (1) For native speakers of English, two years of college-level study of an Asian or Pacific language, or equivalent proficiency (demonstrated by examination). This requirement may be reduced to one year or the equivalent for students whose undergraduate major was in a European language. (2) For non-native speakers of English, attainment of special English proficiency standards set by the TESL program. Students who fail to satisfy these standards by the end of their program are awarded a certificate in lieu of the M.A. degree. Experience has shown that foreign students who score less than 550 on TOEFL will probably have difficulty in meeting the TESL English standards. (Coursework which may be necessary to meet the language requirements of (1) and (2) above is additional to the 36 credits specified by the program.)

Core courses required of all program students total 18 credits, and are listed below. The remaining 18 elective credits are expected to contribute in a significant way to the general goals of the program and to strengthen the student's professional competence. Suitable electives may be found in the departments of English, linguistics, speech-communication and English as a second language, as well as in certain other departments. Foreign students must include in their elective work at least one course in American studies.

Because of problems of sequencing certain courses, entry into TESL is normally permitted only in Fall semesters. No program work is offered during summer sessions, although language training and some elective courses may be available then.

Additional information relating to the matters discussed above, and to further program requirements, is contained in a program brochure. Those considering entry into the TESL 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.

LINGUISTICS
320 General Linguistics (3)

SPEECH-COMMUNICATION
412 Phonetics and Phonemics of American English (3)
(English 404 may be substituted for Speech-Communication 412)
ENGLISH
401 Modern English Grammar (3)
404 English Phonology (3)

(Speech-Communication 412 may be substituted for English 404)

ENGLISH AS A SECOND LANGUAGE
610 Teaching English as a Second Language (3)
710 Materials Development for TESL (3)
730 Seminar in Applied Linguistics (3)

Zoology

Graduate Faculty
A. J. Berger, Ph.D. (Chairman)—ornithology, human and avian anatomy
J. E. Alicata, Ph.D.—parasitology
J. M. Arnold, Ph.D.—developmental biology
A. H. Banner, Ph.D.—invertebrate zoology, systematics
J. Branham, Ph.D.—experimental embryology
V. E. Brock, M.A.—fishery biology, oceanography
G. W. Chu, Ph.D.—parasitology
W. A. Gosline, Ph.D.—ichthyology, zoogeography and evolution
S. R. Haley, Ph.D.—invertebrate embryology
P. Helfrich, Ph.D.—ichthyology, ecology
R. W. Hiatt, Ph.D.—ecology, marine biology
S. C. Hsiao, Ph.D.—experimental embryology, comparative anatomy
F. I. Kamemoto, Ph.D.—physiology, endocrinology
R. E. Kane, Ph.D.—cell biology
E. A. Kay, Ph.D.—malacology
J. A. Maciolek, Ph.D.—limnology, fishery biology
D. C. Matthews, Ph.D.—invertebrate zoology
J. E. Randall, Ph.D.—ichthyology
S. A. Reed, Ph.D.—coral physiology
E. S. Reese, Ph.D.—behavior, ecology, invertebrate zoology
E. D. Stevens, Ph.D.—physiology
A. L. Tester, Ph.D.—fishery biology, biometry
S. J. Townsley, Ph.D.—invertebrate zoology, ecology, radio-biology
P. B. van Weel, Ph.D.—physiology, physiological ecology

Affiliate Faculty
Y. Kondo, Ph.D.—malacology
J. C. Marr, M.A.—fishery biology, population dynamics
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 per-
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 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.

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<td>Histology (3)</td>
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<td>Microtechnique (3)</td>
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<td>Embryology (4)</td>
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<td>Animal Physiology (3)</td>
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<td>435</td>
<td>Endocrinology (2)</td>
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<td>Natural History of the Hawaiian Islands (2)</td>
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<td>Avian Biology (3)</td>
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<td>General Ichthyology (3)</td>
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<td>Limnology (3)</td>
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<td>Isotopic Tracers in Biology (3)</td>
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