ACADEMIC INFORMATION

is the Thanksgiving recess of the next semester. (See calendar for specific dates.)

When the instructor records a grade of I on the final grade card for undergraduate courses (100-499), he must also record the grade which will replace the I 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 incompletes (work including the final examination, if it is not taken). This alternate grade may be any one of the following: A, B, C, D, F, or if the course was taken under Credit-No Credit, CR or NC.

When the instructor records a grade of I on the final grade card for graduate courses (600-799), he will not record an alternate grade to replace the I if the work is not made up by the deadline. If the work is not completed by the specified time for these courses, the grade of I will remain.

If the work is completed for any course prior to the deadline, the instructor will report a change of grade, taking the completed work into consideration.

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

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

Grade Reports. Grade reports are sent to students through the mail by the Admissions and Records Office, Bachman 125, at the end of each semester and summer session.

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

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

The Credit-No Credit Option must be exercised by September 17 for the fall semester and February 1 for the spring semester, and only under the following conditions:

1. Except as noted, courses taken under the CR/NC option may not be applied toward the requirements for the master's degree. Only 699/799 directed research courses may be taken on CR/NC at the option of the graduate field of study and may be granted credit toward a master's degree within the limits already prescribed by the Graduate Division (two credits in Plan A thesis programs).

2. A course for which a grade of NC is received may be retaken under the CR/NC option, or under the regular letter-grade system.

3. The CR designation in the non-letter grade system denotes D-caliber work or better (at the graduate level, C or better).

4. The NC designation and the course in which it is received will appear in official records as part of the student's academic history.

5. The NC designation affects neither the credit hours total nor the grade-point total of the student.

6. The CR designation assumes all functions and meanings of the former P (Pass) designation.

REQUIREMENTS FOR CONTINUED REGISTRATION

To remain eligible for further graduate work and to be awarded a graduate degree, a student must have a B average (3.0 grade-point ratio) for all courses numbered 300-499 and 600-799 (300-799 for M.B.A. candidates). Furthermore, he must also have a B average for all graduate courses (i.e., courses numbered 600 and above).

The Graduate Division will disregard grades for courses numbered 100-299 and 500-599 (except for 500-599 courses in Business Administration) in arriving at these grade-point ratios.

Credit-hour requirements for graduate degrees can only be fulfilled by grades of A, B, and C except for 699/799 courses taken under the Credit-No Credit Option. Grades of CR for 699/799 directed research courses are not counted in credit-hour requirements within stated rules, but are not computed for grade-point ratios. Grades of NC under the Credit-No Credit Option are not computed. Grades of D and F will not be counted toward the completion of requirements for advanced degrees but will be counted in computing the grade-point ratio.

A student admitted as a regular student whose cumulative grade-point average fails to meet the minimum requirements after completing at least 12 credit hours or after completing two semesters of course work will be placed on academic probation for the following semester for the duration of that semester.

However, a student admitted as a probational student whose grade-point ratio since admission fails to meet the minimum requirements after completing one semester of course work will be placed on academic probation for the following semester for the duration of that semester.

All grades for courses taken during the probationary semester, as well as for all previous semesters, will be included in calculating the grade-point ratio at the end of the probationary semester. No extensions of the probationary semester may be granted due to Incompletes (I).

A student on probation who fails to attain the minimum standards at the end of the probationary semester will be denied further registration in the Graduate Division.

A student whose academic record falls below the required minimum at any time following one academic probationary semester is not eligible for an additional probationary semester, resulting in dismissal.

For purposes of these rules, a "semester" is the calendar period, regardless of the number of credits taken.

Two summer sessions equal one semester, regardless of the number of credits taken. For M.B.A. candidates taking


UNIVERSITY OF HAWAII AT MANOA
1973-74 GRADUATE DIVISION CALENDAR

Application deadlines for graduate admissions—new, renewal & reconsideration—are as follows:

1) for Spring 1974 from May 1 to Sept. 1, 1973
2) for Fall 1974 from Nov. 1, 1973 to Mar. 1, 1974

Application deadlines for change in field of study are as follows:

1) for Spring 1974 from May 1 to Oct. 10, 1973
2) for Fall 1974 from Nov. 1, 1973 to Mar. 1, 1974

Applications accepted for Fall and Spring semesters only.

Last day to file petition for admission to doctoral program (only by currently enrolled UH master's candidates graduating at end of semester) are as follows:

1) for Spring 1974 — Nov. 1, 1973
2) for Fall 1974 — Apr. 30, 1974

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<td>Dec. 3</td>
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GRADUATE DIVISION STAFF
Howard P. McKaughan, Ph.D., Dean
Hilmer A. Frank, Ph.D., Associate Dean, Programs and Personnel
Arthur N. L. Chiu, Ph.D., Associate Dean, Research and Fellowships
Leatrice T. Mirikitani, Ph.D., Assistant Dean, Student Services

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Kenneth K. Lau, B.A., J.D., LL.M., Secretary of the University
Roy Y. Takeyama, B.S., M.S., LL.B., Secretary of the Board of Regents
The University of Hawaii at Manoa is the principal campus in Hawaii’s nine-campus statewide system of higher education.

From its beginnings as a land-grant college of agriculture and mechanic arts, it has grown to a multi-dimensional university operation conducting education, research, and public service programs for the state, the nation, and the world community.

Throughout its history, UHM has emphasized studies related to the distinctive geographical and cultural setting of Hawaii. Geographical location generates interest in oceanography, marine sciences, and interdisciplinary studies of tropical environments, problems and resources. The physical characteristics of Hawaii focus academic attention in such areas as tsunami research, volcanology, astronomy, and astrophysics. The state’s multi-racial culture and close ties to Asia create a favorable environment for the study of various aspects of diverse cultural systems, including such subjects as linguistics, genetics, philosophy, and interrace relations.

In all, the University offers course work leading to the bachelor’s degree in 69 fields. The master’s degree is offered in 73 fields, and the doctorate in 34.

The UHM campus is located on some 300 acres of land in Manoa Valley, a residential section close to the heart of metropolitan Honolulu, the state capital. Easy access to the center of the commercial, cultural, and political life of Hawaii is an extra educational benefit for students.

In addition to the facilities on the main campus, the University operates various research and public service activities at locations throughout the state. The University’s statewide system of higher education maintains a second four-year campus at Hilo and seven community colleges: four on Oahu and one each on Maui, Kauai, and Hawaii. Another four-year college and another community college are in the planning stages.

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

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

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

In 1964 the state legislature authorized the University to operate a statewide community college system. The community colleges offer a variety of college transfer and general education curricula on all campuses and award associate degrees.

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

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

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

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

Accreditation. The University of Hawaii at Manoa 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 and a 12-week Summer Session which offers three overlapping 6-week terms. (See ""University Calendar"" p. 2)
Administrative Organization. University governance is vested in a board of regents appointed by the governor of Hawaii. They in turn appoint a president of the University, who acts as executive officer of the board and is responsible for educational leadership in the University system. Chief administrative officers for the various campuses are either chancellors or provosts. The University of Hawaii at Manoa is headed by a chancellor.

Equal Opportunity Policy. The University subscribes to, and complies with, all state and federal statutes, rules and regulations and any amendments thereto, promulgated from time to time, which prohibit discrimination in its policies and practices applicable to its campuses, programs and activities.

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

Inquiries. Prospective students should address inquiries to the following offices of the University of Hawaii at Manoa.

Undergraduates: Office of Admissions and Records, Bachman Hall 125, 2444 Dole Street, Honolulu, Hawaii 96822.
Graduate students: Graduate Division Office, 2540 Maile Way, Honolulu, Hawaii 96822.
General studies: College of Continuing Education and Community Service, 2500 Dole Street, Honolulu, Hawaii 96822.
Summer session: Summer Session Office, Room 101, 2500 Dole Street, Honolulu, Hawaii 96822.

RESEARCH AND SERVICE OPERATIONS

The Office of Research Administration was authorized by the board of regents to provide assistance to the faculty in the planning and processing of individual applications for extramural research grants and contracts; to maintain a record of all active and pending research projects; to serve as liaison for the University with the federal and private funding agencies; and to provide administrative services, general supervision, coordination and encouragement in support of individual faculty research. As the organized research centers, institutes and laboratories were authorized, many were placed for administrative purposes under the supervision of this office. Currently there are 12 organized research units coordinated by the director of research.

This office also administers extramurally sponsored programs which do not fall under the aegis of research. This involves reviewing, processing and maintaining current files on extramurally supported training programs, institutional and departmental development programs, acquisition of equipment programs, fellowship and traineeship programs for graduate study and others.

Working closely with the University Research Council, this office supports and facilitates the research function of the University through intramural grants of state and federal funds to individual faculty members on all campuses. A program of faculty professional travel is also administered by this office in cooperation with the council.

In order to facilitate projects awarded to members of the faculty, this office provides fiscal support to certain awardees in all of their fiscal and business affairs.

This office initiates and encourages interdisciplinary, University-wide application for grants. Though not directly involved in the operation of cross-disciplinary activities, it often serves as a catalyst, bringing interested faculty together to discuss potential University-wide proposals for financial support.

This office serves also as the liaison between the University and the Research Corporation of the University of Hawaii. The transfer of University projects to the corporation is effected through this office.

Some of the University’s research and service operations are described below.

The Computing Center operates an IBM 1401 system and an IBM 360/65 system, along with a supporting line of peripheral punched card equipment. It provides services in statistical consultation, system design, data processing and computing, and educational and reference advice to University divisions and departments.

The Economic Research Center conducts research studies pertinent to the economic welfare and development of Hawaii. In cooperation with the University’s academic departments, the center offers research training to advanced students.

The Education Research and Development Center facilitates educational planning and practice in Hawaii and the Pacific Basin. The center uses an interdisciplinary behavioral science approach. Major programs focus on achievement motivation, educational attainment of various ethnic and socio-economic groups, social/moral status and development, and cognitive learning.

The Environmental Center coordinates education, research, and service efforts of the University related to ecological relationships, natural resources, and environmental quality, with special relation to human needs and social institutions, with particular regard to Hawaii.

The Foreign Language Laboratories, located in Moore Hall, consist of four “library” labs and two “class” labs for foreign language learning. In the lab complex is also a professional recording studio where about half of the language tapes are produced. The master tape library contains approximately 10,000 tapes in 32 foreign languages.

The Hawaii Cooperative Fishery Unit promotes graduate training and research in fishery biology by providing students with support, counseling, and facilities. It functions as part of the department of zoology. The research program centers on 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 and the U.S. Bureau of Sport Fisheries and Wildlife.

The Hawaii Institute of Geophysics conducts geological, geochemical and geophysical research in the broad field of the earth sciences. Programs embrace research and advanced
training in geodesy, physical oceanography, solid earth geophysics, geology, soils, geochemistry, underwater acoustics, and tsunamis. The institute maintains two research vessels, a twin engine aircraft, a ship operations facility, and a seismographic observatory.

The Hawaii Institute of Marine Biology with facilities on Coconut Island in Kaneohe Bay and at Kewalo Basin, has research programs in the marine biological sciences, including fisheries. It also provides facilities and services for faculty members, graduate students, and visiting scientists. 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 aquaculture research under the Sea Grant Program.

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

The Institute for Astronomy is responsible for University research programs in astronomy. It also assists in providing graduate training. The institute operates observatories on Mount Haleakala, Maui, for studies of the sun (especially the corona) and of the zodiacal light. On Mauna Kea, Hawaii, is an observatory for planetary and stellar studies, equipped with an 88-inch and two 24-inch telescopes. A space astronomy program has obtained high resolution ultraviolet spectrograms of the sun from rockets, and includes plans for work based on satellites and space probes.

The Instructional Resources Service Center offers assistance and consultation to faculty in examination of instructional objectives, overall strategy planning, organization of instructional media, development of media evaluating systems, and the necessary follow-up for effective development and implementation of programs.

The selection, location, production, evaluation, and effective use of media are coordinated for faculty and staff by the center. Services and facilities include twelve multi-media auditoriums on the Manoa campus and Varsity Theatre just off campus: a closed-circuit television (CCTV) system in Kuykendall Hall where videotaping can be done for instructional analysis, micro teaching, and the recording of instructional demonstrations; a Graphic Media Design section which prepares and develops graphic materials; a Media Lab with facilities for faculty media workshops, self-paced materials for learning AV equipment operation, and reference materials. Faculty wishing to make their own transparencies and other instructional materials may use the self-service facilities. The center also coordinates the preview evaluation and selection of films to be added to the University's film collection.

The Laboratory of Sensory Sciences conducts basic research in neurosciences. The research staff, representing several disciplines including experimental and comparative psychology, neurophysiology, and biophysics, share a common interest and actively collaborate in work on problems of the reception, processing, and integration of sensory information by nervous systems. Techniques in use include animal training, psychophysical testing, computer analysis and modeling, surgical and pharmacological intervention, and electrical stimulation and recording. Many different animals, vertebrate and invertebrate, are studied. They are selected primarily on the basis of their experimental suitability for studying problems of general biological significance, although there is interest also in comparative analysis.

The laboratory also works with staff of academic departments and other research institutes. Graduate students are formally associated with one of the academic departments in which members of the research staff hold appointments (physiology, psychology, zoology) although they are encouraged in their research to take advantage of the interdisciplinary character of the laboratory. Active graduate and postdoctoral training programs are being developed, as well as a program for senior visiting investigators.

The Land Study Bureau plans and conducts basic and applied research, and publishes its findings, with the objective of achieving highest and best use of the lands of Hawaii. It participates in the University's teaching program and works cooperatively with students, faculty and staff to seek solutions to Hawaii's environmental, economic and social problems. The bureau also advises and participates in the technological and economic development of areas throughout the Pacific and Asia.

The University of Hawaii Library provides extensive library resources for the University community. Collections total approximately 1,200,000 volumes, including 15,000 currently received periodicals.
The main book, periodical and microform collections are in Thomas Hale Hamilton Library. The open stacks contain approximately 730,000 volumes.

The undergraduate collection in Gregg M. Sinclair Library has 85,000 books and periodicals. It includes the Reserve Book Room (for graduate and undergraduate courses), a browsing collection, a collection of college catalogs, and a Clearinghouse for Innovative Developments in Higher Education, and the Listening Center.

Special research collections also in the Sinclair Library building are the Asia Collection, Hawaiian and Pacific Collections, Government Documents, Rare Books and University Archives.

Audio-visual Services, also in Sinclair, maintains a 16mm film collection and various types of portable projection and audio equipment. It also maintains decentralized pools of such equipment in seven classroom buildings on campus.

The JKK Look Laboratory of Oceanographic Engineering conducts experimental research on hydraulic engineering problems related to structures in and physical characteristics of the coastal zone and deeper ocean. It also researches physiological problems related to human performance in the sea. Laboratory facilities include water wave tanks and hyperbaric facilities, as well as an 18-foot runabout. The laboratory is part of the department of ocean engineering.

The Harold L. Lyon Arboretum occupies 124 acres in Manoa Valley, about 2.5 miles from the Manoa campus. Facilities include two green-houses, office-laboratory buildings, and approximately 6,000 accessions inventoried and maintained for instruction and research in botany, biology, zoology, agriculture, phytochemistry, pharmacology, medicine, art, and architecture. An herbarium, with approximately 2,000 specimens and a reference library, is also maintained.

The Pacific and Asian Linguistics Institute researches languages of Asia, the Pacific Basin and the Americas, with special attention given to previously undescribed languages. Work includes compilation of bi-lingual dictionaries, grammatical descriptions and pedagogical materials. The institute also conducts research in the areas of sociolinguistics, bilingualism, and language planning for the Pacific area.

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. It also maintains the Kewalo Marine Laboratory at Kewalo Basin.

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

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

The Social Science Research Institute facilitates the initiation of faculty research and develops and conducts programs primarily of an interdisciplinary nature in the social sciences and related fields. Emphasis is given to comparative studies, futuristic analysis, and quantitative methodology. The institute is developing new programs in Hawaii community studies, political leadership, automation and society, comparative legislative studies, and multi-disciplinary seminars. It assists a program for the study of contemporary Korea as well as a long-term study of culture and mental health in Asia and the Pacific. Support services include computer consultation, manuscript typing, distribution of working papers and publications, information on social science research and grant assistance.

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

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

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

The University Press of Hawaii publishes books, journals, and films of high merit which add to the sum of knowledge, particularly those which reflect the regional or special interests and responsibilities of the University, the East-West Center, and other scholarly research organizations in the state. All titles published carry the imprint "The University Press of Hawaii." Titles published for the East-West Center also carry the subimprint "An East-West Center Book." It is a member of the Association of American University Presses and the International Association of Scholarly Presses. Books of general interest as well as scholarly monographs, and four scholarly journals, Asian Perspectives, Oceanic Linguistics, Pacific Science, and Philosophy East and West, are published. The Press also operates a sales program, East-West Export Books, in Asia and the Near East on behalf of 12 American scholarly publishers.
Editorial control (final selection of manuscripts) is vested in a board made up of University of Hawaii faculty members appointed by the president with the advice of the EWC chancellor. Faculty members are encouraged to submit book-length manuscripts to the director. Journal papers should be submitted to the respective editors.

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

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

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

INTERNATIONAL PROGRAMS

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

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

The University also provides an academic house for the only nationally funded Center for Cultural and Technical Interchange Between East and West: the East-West Center, with institutes devoted to the study of communications, culture learning, food, population, and technology and development. (See section on “East-West Center”.)

COOPERATING INSTITUTIONS

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

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

The Hawaiian Fruit Flies Investigations Laboratory is maintained on the campus by the U.S. Department of Agriculture, Agricultural Research Service. It develops basic information on, and methods for, the control and eradication of fruit fly agricultural pests, and makes recommendations on the treatment of produce to pass through quarantine into mainland and other markets. A substation is located at the Waiakea Experimental Farm near Hilo. The laboratory cooperates with the department of entomology and other University and state agencies.

The Hawaiian Sugar Planters’ Association provided, jointly with the Pineapple Research Institute, funds for building the Agricultural Engineering Institute shop facilities for instruction and research. The association donated its Experiment Station arboretum—the renowned 125-acre H. L. Lyon Arboretum—to the University. HSPA has provided grants to the departments of agronomy and soils, and plant pathology. It has supported a graduate fellowship in entomology. HSPA Experiment Station staff scientists and engineers serve as members of the affiliate graduate faculty, supervise graduate students in research, and work on joint research projects with the University.

The Honolulu Academy of Arts is a nationally accredited museum which features a world-renowned collection of Asian art treasures as well as outstanding Occidental holdings. The permanent collections are augmented by a diversified schedule of temporary exhibitions from world-wide sources and a research library for members, scholars and students. An extensive education program is conducted for young people and adults, with special benefits offered to Academy members. The Academy’s extension for Asian decorative arts, Spalding House and gardens, provides the setting for exhibitions, lectures, programs, demonstrations and a center for the exhibition and study of Ukiyo-e woodblock prints.

The Pacific and Asian Affairs Council provides a World Affairs Program as an educational service to all public and private secondary schools throughout the state. The program operates in the schools as a major curriculum supplement. To produce the program, PAAC coordinates educational and professional resources in international affairs.

The Pineapple Research Institute of Hawaii, supported by the pineapple industry, has most of its staff of scientists on the affiliate graduate faculty of the University. Offices and laboratories are located near Wahiawa, Oahu.

The Honolulu Laboratory of the Southwest Fisheries Center National Marine Fisheries Service, NOAA, U.S. Department of Commerce, is located adjacent to the campus. Several senior staff members hold appointments on the affiliate graduate faculty. The laboratory conducts 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.

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

*(Tuition and fees subject to change)*

Tuition and fees for graduate students are the same as for undergraduates, except for the application fee.

**Application Fee**

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

This fee is applicable to the following categories of applicants as well:

**Returnees.** Students who leave the University of Hawaii and are out for at least two consecutive semesters (not counting summer session) pay the $10.00 fee when they apply for readmission. The following categories of students are exempt: (a) students who are out for one semester only, (b) any Ph.D. or master's degree candidate returning to register for Thesis 800 only, (c) EWC students returning from field study tours, (d) students returning from military leave, (e) school teachers with the State of Hawaii Department of Education and in-state librarians who are degree candidates who attend summer sessions only.

**Renewals.** Newly admitted students who are no-shows or who completely withdraw from courses within that first semester of enrollment pay the $10.00 fee if they apply for readmission after a lapse of two or more consecutive semesters, not counting summer session. Students applying for readmission after a lapse of only one semester are exempt from this fee.

**Students Who Apply for Changes in Fields of Study.** Students who apply for changes in fields of study pay $10.00 for each application filed.

**Reconsiderations.** Students who have been denied admission by the Graduate Division and/or the Graduate Field of Study pay the fee for each reconsideration requested.

**Tuition**

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

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

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

*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.*
Advance Partial Tuition Payment

New nonresident students pay $90.00; all other students, including continuing and returning nonresidents, $27.00. This deposit is nontransferable (applicable only for the semester for which the deposit is made) and nonrefundable (may not be refunded if the student fails to register for the semester for which the deposit is made).

Fees

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

General. Full-time students pay a general fee of $18.00 per semester. All half-time graduate assistants are exempt from this fee.

Activities and Campus Center Fees. All students, including half-time graduate assistants, must pay both the Activities and Campus Center fees.

The Activities fee is $.50 per credit, up to a maximum of $4.50.

The Campus Center fee is as follows:

- Students with 9 or more credit hours, $7.50
- Students with 8 or less credit hours, $4.50

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.

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.

Payment for all fees except the application fee should be made at the treasury office.

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:

- 100% (less $12.50 general fee) for complete withdrawal only if made on or before the following dates:
  - August 31, 1973 for the fall semester
  - January 18, 1974 for the spring semester
- 80% during the first two weeks of instruction.
- 40% during the third and fourth weeks.
- 0% after the fourth week.

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

ASSISTANTSHIPS AND FELLOWSHIPS

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

In addition, one-half time assistantships are available in various fields in connection with research contracts or grants supervised by members of the faculty. Inquiries concerning these should be addressed to the chairman of the appropriate field of study.

All applicants for graduate assistantships must be admitted as potential degree candidates to qualify for appointments. Applicants for assistantships are therefore advised to apply for admission to the Graduate Division prior to or at the same time consideration for the assistantship is requested.

East-West Center Scholarships. See p. 17 for details.

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

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

- National Science Foundation Graduate Fellowships
  National Research Council
  2101 Constitution Avenue
  Washington, D.C. 20418

- HUD Urban Studies Fellowship Program
  U.S. Department of Housing and
  Urban Development
  Washington, D.C. 20410
Awards in the second category, which vary in source from federal to local, include EPDA, Part E Fellowships for Prospective Community College Teachers, as well as a large number of smaller programs. At the University of Hawaii nominations for these awards are made by the departments that are eligible. Students are urged to exercise their initiative to explore the various possibilities. In any case, the first place to inquire is your major department.

FINANCIAL AIDS

The fundamental purpose of the Financial Aids Program is to provide services to students partially or wholly self-sustaining or otherwise in need of assistance to meet the costs of their educational programs. The operating philosophy is that parents/students have the primary responsibility to provide for the expenses of education and that financial aid is designed to fill the gap between parents' students' ability to pay and the actual educational costs.

Fiscal services are provided through the award of scholarships, grants, loans and student employment to the degree that is consistent with student's needs and the availability of resources. Counseling services are also provided on an individual and group basis as an extension of the educational experience.

The University subscribes to the College Scholarship Services (CSS) and utilizes the CSS form as a composite financial aid application for most of the student assistance programs it administers. The CSS forms are available at high schools, community colleges or the financial aids office (1627-A Bachman Place. Honolulu. Hawaii 96822). The deadline for submission of the CSS forms to the appropriate CSS office (as indicated on the form itself) is March 1 of each year. Applications will be accepted after this date but there is always the danger on-time applicants will exhaust available funds.

Graduate students seeking fellowships or teaching assistantships should write to the Dean of the Graduate Division. 2540 Maile Way. Honolulu. Hawaii 96822.

LIVING ACCOMMODATIONS AND EXPENSES

Although finding suitable housing has been a major problem for University of Hawaii students for several years, the opening of the new Hale Aloha residence hall complex with its 1,020 bed capacity has reduced the problem. However, the prospective student is still reminded that acceptance to the University does NOT assure him of housing and that housing in Honolulu is scarce and expensive.

For the fall semester there will be on-campus residence hall facilities for about 1,900 single students. Almost all of these assignments go to state of Hawaii residents since priority is given to them. There are no facilities on campus for married students.

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

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

On Campus

Residence halls for University students administered by the housing office include:

Frear Hall and Hale Kahawai (for undergraduate women)$426 room and board per semester.

Johnson Hall and Hale Lauhima (coed halls for undergraduates)$426 room and board per semester.

Hale Aloha (coed hall for undergraduates and graduates)$481 room and board per semester.

Gateway House (coed hall for graduates and upper division undergraduates)$456 room and board per semester.

Board includes 10 meals per week (Monday-Friday, breakfast and dinner).

All halls have double rooms except for fourteen single rooms in Hale Lauhima and one single room in Johnson Hall at $481 room and board per semester, and twenty single rooms in Hale Aloha at $565 room and board per semester.

Off Campus

The off-campus housing office offers limited space in leased hotels and apartments in the Waikiki area to eligible full-time students. Assignments are made on a first-come first-served basis. Inquiries should be directed to: Off-Campus Housing Office, Bachman Annex 5, University of Hawaii. Honolulu. Hawaii 96822.

This office also offers a free central listing service and maintains listings of rooms in private homes, apartments, houses, sharing accommodations, and room-and-board situations; however, these listings are very limited and quickly exhausted. Contacts with off-campus landlords must be handled directly by the students: because of the rapid turnover the names of landlords cannot be sent through the mail. The rush for housing usually starts about three weeks prior to the beginning of classes. (Students arriving in Honolulu are strongly advised to plan for temporary lodging for a period of one to two weeks while they look for suitable housing. This means bringing sufficient funds and reserving such temporary lodging or making whatever arrangements necessary to provide a base while looking around.) There is no place on campus to which luggage or mail may be forwarded ahead of arrival. Reference maps and telephone service are available in the office. Office hours are Monday-Friday, 7:45 a.m.-4:30 p.m. The general housing picture is one of extreme shortage: this means expense and difficulty in the locating of suitable housing.

The off-campus housing office is located in Bachman Annex 5 behind Bachman Hall.

Food Services

Gateway House Cafeteria. Open to the general campus for lunch only.

Aloha Cafeteria. Primarily for residents of Hale Aloha; guests can be accommodated at special guest rates.
**Hemenway Hall Cafeteria.** Plate lunches, sandwiches and snacks are served.

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

**Snack Bar.** Lunches and snacks.

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

**Expenses**

Minimum expenses per academic year are estimated to be approximately $2,662 for students living in off-campus housing; $2,143 for students living at a University residence hall; $1,663 for a student living at home. These estimates do not include the costs related to dependents, transportation for out-of-state students, extensive medical/dental care or the tuition differential for nonresident students. They do include costs for board, room, resident tuition, books, supplies, fees other than those related to curricula, clothing, recreation and personal/miscellaneous.

**STUDENT SERVICES**

**Student Health Service**

The Student Health Service, 1710 East-West Road, assists the student in protecting his health. Facilities include both an out-patient clinic and an infirmary. Most student illnesses can be cared for through this service. If simple bed care is indicated, the student may be admitted to the infirmary. The clinic is open from 8:00 a.m. to 4:30 p.m., Monday through Friday; and 9:00 a.m. to 11:00 a.m. on Saturday. Physicians are present at the clinic from 8:30 a.m. to 11:45 a.m. and 12:30 p.m. to 4:15 p.m. Monday through Friday; and 9:00 a.m. to 11:00 a.m. on Saturday. A nurse is available during off-duty hours for emergency services only.

Although the service is free, students must pay for drugs prescribed and there is an infirmary charge of $4.00 a day. The health care services are limited; supplemental health and accident insurance is therefore essential to provide the student with medical care beyond the scope of this service. The health service strongly endorses the ASUH-sponsored health plan, the cost and benefits being superior to most health insurance plans open to student subscribers. Consult the student activities bureau and the student health service for information.

The University requires that all newly registered daytime students undergo a complete medical examination, and the results of this examination must be submitted to the health service on the University of Hawaii Health Form for approval before medical clearance can be granted and registration completed. **REGISTRATION AS WELL AS MEDICAL SERVICES WILL BE DENIED ALL STUDENTS WHO DO NOT COMPLY WITH THIS REQUIREMENT.** Students who are returning to the University to continue their education after being away more than four years must resubmit this health form for approval. Payment for these preadmission medical examinations is the personal responsibility of the student.

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

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

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

**University Placement and Career Planning**

The office of Placement & Career Planning is concerned with those aspects of education and personal development which deal with student and alumni search for an optimum career. Services are provided in areas of self-appraisal, vocational and employment information, specific job opportunities, job-seeking campaigns, evaluation of offers, and graduate studies. Counseling services are primarily career and employment oriented and stress self understanding and the candidate's responsibility for his own future. Placement services supplement the personal initiative and creativity of students in making career decisions compatible with their interests, qualifications, needs and values.

The office cultivates the interest of prospective island, mainland and overseas employers and provides them with facilities to contact students and former students who are seeking career 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 a teaching or other academic career.

Campus interviews for graduating students are scheduled with recruiting representatives of mainland and Hawaii organizations that offer career opportunities in business, industry, education, government and the military. A few recruiting organizations show interest in hiring foreign students for employment in their home countries. The campus interviewing program is conducted primarily during October, November, February and March. In addition, several hundred employment opportunities are listed each year by employers who find it impractical to make campus visits.

Early registration is encouraged during the final year of study or earlier for students who have a need for career planning assistance. All services are extended to University of Hawaii alumni.

**Counseling and Testing Center**

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

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

Parking permits are sold in the lanai of the swimming pool 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 government regulations and procedures, institutional rules and regulations, finances, employment, living arrangements, and encourages the development of meaningful and continuing relationships between foreign students and the community. Special orientation programs are held at the beginning of each semester to provide an understanding of American culture, values, and institutions in order to assist in the foreign student's transition to American academic life.

The office, located in Electrical Engineering Quadrangle, Laboratory 1, advises American students who seek opportunities for overseas service and travel. and who wish to engage in international student activities while at the University of Hawaii.

Non-U.S. citizens who are graduates of a university and are applying for admission to the University of Hawaii should write to the chairman of the appropriate field of study, or to the Graduate Division Admissions Office, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822. Those interested in undergraduate admission should contact: Office of Admissions and Records, University of Hawaii, 2444 Dole Street, Honolulu, Hawaii 96822.

RIGHTS AND FREEDOMS OF FOREIGN STUDENTS

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

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

For its part, the University of Hawaii guarantees all students the freedom of silence. No student is required to engage in research 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.

ENGLISH LANGUAGE INSTITUTE

The University of Hawaii has 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 of all new foreign students, and providing suitable instruction for those 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. Registration for University course work is not permitted until this evaluation has been made.

Exemption from ELI. Following ELI's evaluation of their English proficiency, the following foreign students are exempted from ELI training:

(a) those whose native language is English;
(b) those who hold a bachelor's or master's degree from an accredited university in the United States, Australia, Canada, England, New Zealand;
(c) those whose English meets the University's standards for full-time study.

Waivers. Academic departments may assume the responsibility of waiving any or all of a foreign graduate student's recommended ELI courses. Signed waiver forms must be submitted to the ELI office in Moore Hall, room 570.

Assignment to ELI Courses. All foreign students not exempted on the basis of their entrance proficiency testing are assigned to an appropriate program of ELI instruction, except as waivers apply. Because of their special purposes, ELI courses take precedence over all other course work. They may not be postponed to a subsequent semester, nor may they be dropped or taken with auditor status. Students who fail to comply with ELI assignments may be denied further registration at the University.

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 English competence. Students required to take relatively large amounts of ELI work during their first and second semesters must expect to make proportionately slower progress in their regular University studies. This is an especially important factor in some graduate programs, and should be carefully considered by all foreign students whose time or financial support is limited.

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 University for the sole purpose of entering ELI in order to improve their English will not be accepted. Such students may be eligible for H.E.L.P. (Hawaii English Language Program): for information write to H.E.L.P., College of Continuing Education and Community Service, University of Hawaii at Manoa, 2500 Dole Street, Honolulu, Hawaii 96822.
EAST-WEST CENTER

The East-West Center is an international educational institution established in Hawaii by the United States Congress in 1960. Formally known as the "Center for Cultural and Technical Interchange Between East and West," the institution brings men and women together from Asia, the Pacific area and the United States to exchange ideas in a variety of cooperative programs of study, training and research.

The federally-funded East-West Center is administered by the University of Hawaii board of regents to further the broad national goal of fostering better relations and mutual understanding among the peoples of the area. Each year nearly 2,000 degree students, midcareer professionals seeking further knowledge and skills in short-term projects, and research-oriented senior fellows and fellows study, work and confer together in East-West Center programs. They are supported by annual grant appropriations from the Congress, supplemented in some fields by cost-sharing contributions from Asian/Pacific governments, regional agencies and private foundations. Student scholarships and fellow grants are awarded on the basis of two Asian/Pacific participants for each American grantee.

Academic instruction is provided for degree students, predominantly at the graduate level, by the University of Hawaii. Degrees are awarded by the University. Some East-West Center program staff members hold joint faculty appointments with the University. Professional study and training programs and research are directed by Center staff members. Fundamental to Center goals is the interchange of information, ideas and beliefs in an atmosphere of academic freedom. The Center's multinational staff, in association with the University of Hawaii, provides the basis for growing cooperative arrangements with universities and other institutions in Asia, the Pacific area and the United States mainland. Center programs combine theory and practice in providing present and future leaders the opportunity for dealing with mutual problems. The Center offers other opportunities, including field education, which extend beyond formal course work. Academic degree study, research and professional study and training are integrated in problem-oriented institutes whose programs foster deeper intercultural understanding.

Problem-Oriented Programs

The East-West Communication Institute provides graduate students, scholars and professionals in various fields of communication with the opportunity to work together in programs of education, research and training. Broadly seeking insights into the processes of sharing knowledge across cultural frontiers, the institute is directly concerned with helping build and strengthen mass media and other communication systems essential to social and economic change and development in the United States, Asia and the Pacific area. In addition to those with prime interest in communication studies, more generalized students and scholars in the social sciences and humanities can find appropriate areas for study and research emphasizing cross-cultural communication. Scholarships for M.A. and Ph.D. studies are awarded through the institute in such disciplines as Asian studies, American studies, anthropology, design, educational communications, educational psychology, library studies, Pacific islands studies, political science, psychology, sociology, speech communication and related fields. In addition to their degree work, students are expected to become knowledgeable in communication research and theory, and to develop media skills in the use of communication in development programs. Students also participate with senior scholars and professional practitioners in institute-directed research, seminars, workshops and training projects. Jefferson Fellowships are awarded annually to mid-career Asian/Pacific and American journalists in print and broadcast media for a semester of non-credit study at the University of Hawaii in fields relating to developmental communication. They also participate in a wide range of professionally-related activities, including an observation tour of the U.S. mainland. The institute, under a grant from the Agency for International Development, is carrying out a three-year inventory/analysis study of information, education and communication support for family and population planning programs, as well as training and research in these fields. Other communication resource material is collected for use of students and scholars, as well as for dissemination to other institutions through such means as a newsletter, microfiche, bibliographies, abstracts, summary translations, etc.

East-West Culture Learning Institute activities are based on the premise that a culture is a society's way of life which expresses certain meanings and values in humanistic achievements, institutions and forms of behavior. Through multinational, multi-disciplinary programs of research, education and training, the Institute is observing and analyzing the relationships between elements (or patterns) in and across particular cultures. Its aim in carrying out such analyses and in making such observations is to help people to become aware of and to understand previously unobserved patterns of their own cultures and cultures other than their own. A program of research has been developed which calls for interaction between staff researchers, fellows and graduate students. This program, to avoid scattered effort, is concentrated on four main areas: cultures in contact, language in culture, cultural and national identity and thought and expression in culture learning. Investigations in the first three areas are being carried out into the positive and negative transfer of learning that members of one culture may have when studying about or interacting in another culture; into the socio-cultural and social-psychological aspects of varieties of Asian and Pacific languages in comparison with those of varieties of English and the same aspects of language learning and teaching in Asia, the Pacific Basin and the United States and into factors of social change which inhibit or encourage the growth of cultural identity. Starting with a project in socio-literature and in the belief that one of the ways in which a culture reveals itself most fully is in the thinking which guides it, shapes its values and gives rise to its various creative expressions, the fourth area of interest is concerned with what persons from different Asian, Pacific and American cultural backgrounds think and how they express themselves in the humanities and the arts. Scholarships are awarded to graduate students who will participate in Institute programs and study for M.A. and Ph.D. degrees in such departments as psychology, linguistics and English as a second language. Other disciplines represented include American studies, anthropology, art, drama and theater, East Asian languages, educational administration, educational foundations, educational psychology, English, geography,
The East-West Food Institute deals with an integrated interpretation of the human, technical and economic concerns with food. Research, education and training programs are related to the efficient and profitable production of commodities from land and sea resources; the evaluation and improvement of nutritional quality; techniques of processing, preservation and distribution; and preparation for effective utilization. Programs also deal with economic, social and political policies, cultural values, institutions, and population characteristics related to food from production to consumption. Scholarships for post-graduate study at the master's and doctoral degree levels are awarded through the institute for students in the fields of agriculture, fisheries, nutrition, food technology and economic analysis, as well as the humanities and other natural and social sciences that touch on food-related problems. Institute students, in addition to their primary course requirements, are expected to take at least one course in the tropical application of a food-related discipline; take a course in "Agriculture and Rural Development Administration"; and participate in at least one semester of the institute's seminar "The Food Systems of Asia and the Pacific," a four-semester cycle focusing, in turn, on Southeast Asia, East Asia, South Asia and the Pacific. Students also have the opportunity to join with staff, fellows and professional study participants in "task force" groups dealing with specific problems, insofar as is appropriate to their degree program and career objectives. Research areas given priority include agricultural diversification and multiple cropping, systems of crop protection, food quality, planning and implementation of food-related programs and policies, and application of the "systems" concepts to modernization problems in fields related to food.

The East-West Population Institute, in aiming to contribute to the understanding and solution of population problems, conducts a broad research program, promotes graduate study in its field, organizes a variety of professional study and training projects, and engages in technical cooperation with sister institutions in Asia, the Pacific area and the U.S. mainland. The institute awards East-West Center scholarships to students seeking advanced degrees from the University of Hawaii in various disciplines closely related to population studies. M.A. and Ph.D. degree awards are offered in the College of Arts and Sciences for an interdisciplinary Population Studies Program, involving cooperation of several departments. The aim is to provide opportunities for graduate students to acquire an understanding of demographic structures and processes, and a competence in aspects of population related to their particular discipline and professional orientation. Course offerings include demographic analysis, ecological anthropology, communication, manpower economics, economics of population growth, population geography and rural and urban sociology. M.P.H. and M.S. degree study awards are offered in the School of Public Health involving population and family planning studies, biostatistics, maternal and child health, world population problems, fertility and reproduction, vital and health statistics, techniques of demographic analysis. The institute complements formal graduate training in three ways: by providing more intensive advisory and technical services to students, by involving them in research seminars, and guiding them in field education. For more advanced students, particularly at the Ph.D. level, field work outside Hawaii is arranged and supported by the institute on a team or individual basis. As faculty members teaching University courses in population often hold joint appointments with the institute, a close day-to-day contact is maintained. The institute's geographic focus is the Asian and Pacific area, reflecting Hawaii's unique position at the crossroads of the Pacific and utilizing the University's extensive library and research facilities in Asian and Pacific studies. Research directed by institute staff focuses on two main areas: analyses of the causes and consequences of population change, and on the field of demography proper, with emphasis on studies of population change and composition in Asia and the Pacific. The institute maintains a specialized collection of books and reference materials, and engages in certain service-related activities.

The East-West Technology and Development Institute programs seek to increase understanding of development as a whole, with special emphasis on the interaction and respective roles of men, institutions and technology as economic growth and national development proceeds in both East and West. An added dimension to conventional university education and technical training is provided by involving graduate students, senior scholars, technologists and administrators in integrated development planning on a multinational, multidisciplinary level. Special interest is given to fostering the entrepreneurial role in development by working on problems of organization and management of private and public enterprises. The institute is concerned not only with engineering research to adapt existing technologies and to create new technologies more appropriate to the requirements of both East and West, but also with economic, political, cultural and psychological factors which affect the adoption of new ideas, and with the impact of rapid technical change on the development process as a whole. Advanced degree scholarships are awarded not only in technically-oriented engineering studies, but also in such development-oriented fields as economics, business administration, sociology, political science, urban and rural planning, and the ocean and geosciences. Graduate students are offered the opportunity to become involved in various aspects of training programs. In an effort to increase the sensitivity of technologists to economic and cultural factors, engineering students are encouraged to enroll in at least one social science course in development or development planning. The institute sponsors a research seminar which—because of the multidisciplinary, multinational composition of its staff, senior fellows and students—exposes all participants to a wide variety of approaches and perspectives relating to the problems of technology and development.

Open Grants

A limited number of grants are offered each year for degree study, as well as awards for senior fellows and fellows, in academic fields not directly related to the problem-oriented programs. The Open Grants provide the East-West Center with flexibility for accomplishing its goals and meeting requirements for equitable geographic distribution of participants. Students are selected in a wide range of disciplines, primarily at the graduate level. A few grants are made for undergraduates from countries in Asia and the Pacific to
meet specific objectives. Open Grants students meet the high standards required of all Center participants, including a demonstrated interest in cross-cultural study. While formal coursework and degrees are taken at the University of Hawaii, students are provided the opportunity for participation in various Center activities and informal seminars with senior fellows on open grants. Study themes are selected from year to year for these informal seminars designed to involve fellows and students more deeply in the search for mutual understanding than is normally afforded in formal course work. The general theme for 1973-74 is "The Urban Environment in the Contemporary Spirit."

Scholarships and Grants

Degree scholarships for study at the University of Hawaii and participation in Center-sponsored programs generally include round-trip air fare from the student's home, housing in Center residence halls, tuition and books, medical insurance and a modest stipend for food and incidental expenses. The Center is not able to provide transportation or support for dependents. If the student meets Center requirements, a grant may provide for field education in Asia, the Pacific area or the United States mainland for periods ranging up to eight months for M.A. students and fifteen months for Ph.D. students. Candidates for degrees must provide evidence of professional interest in the Center program of their choice, meet the high academic standards of the University of Hawaii, and at the same time demonstrate interest and potential for contributing to intercultural communication. The Center grantee assumes an obligation to help advance the broader cultural aims of the Center, not only in its academic aspects but also in its day-to-day programs of interchange, both formal and informal. Scholarships for study at the master's degree level are generally awarded for 17 months, if the student begins in September, and for 19 months for those beginning in June. A small number of doctoral study grants are made for 36 months to highly promising individuals who normally must hold a M.A. degree. All degree programs for Americans are at the graduate level. Some undergraduate scholarships are awarded for students from some areas in Asia and the Pacific to meet specific objectives.

Senior Fellows and Fellows are scholars and authorities in fields relevant to institute programs and Center goals who are invited to the Center for participation in research and intercultural activities. Grants are usually awarded for periods ranging from four to twelve months. Senior fellows are scholars and officials who are distinguished and recognized for past professional contributions in their fields. Fellows are outstanding individuals still in early phases of their careers.

Professional Development study grants are made for non-degree participants in a wide variety of projects directed by the institutes, usually on a cost-sharing basis with cooperating institutions or agencies. Ordinarily participants are nominated by the cosponsoring agency and selections made by the East-West Center. Project periods generally vary in length from one month to one year. Housing, living expenses and training costs are provided on the same general basis as provided for academic student grants. Transportation to and from Hawaii is usually provided by the cosponsoring organization or the Center, depending upon the terms of the project.

Language Requirements. Competence in English is essential because Center program activities and University instruction are conducted in English. Applicants whose first language is not English must take the Test of English as a Foreign Language (TOEFL) as part of the selection requirement. On arrival, students may be assigned special course work at the University's English Language Institute. In some cases, foreign students may spend their entire first summer session or first semester exclusively on the study of English so that they may attain the proficiency needed to pursue their chosen fields of study. Foreign applicants who are exempt from the TOEFL examination are: (a) native speakers of English from Australia, Britain, Canada or New Zealand; (b) students who have received a bachelor's degree from an accredited American, Australian, British, Canadian or New Zealand university/college. All native speakers of English are required to take an Asian or Pacific language appropriate to their areas of interest and must maintain a 3.0 or "B" level of performance throughout the grant period.

Supporting Services

The office of Publications and Public Affairs supervises publication of East-West Center Books by the University Press of Hawaii, coordinates other Center publications such as bulletins, newsletters and working papers, and disseminates information on Center programs and activities. The office of Participant Services coordinates intercultural activities, admissions, liaison with former participants, and community relations, including cooperation with the Friends of the East-West Center, a voluntary organization of Hawaii residents which links Center participants with community activities. The office of Administration is responsible for fiscal management, housing, conference logistics and such central services as data processing and duplicating.

General Information

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

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

Further information concerning scholarships and grants may be obtained by writing to the Office of Admissions, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.
(The following regulations and procedures governing admission to the Graduate Division at the University of Hawaii are subject to change without prior notice. Prospective students should always consult the most current catalog before applying for admission.)

ADMISSION

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 a U.S. university, may be admitted to the Graduate Division, subject to the following qualifications: (1) that the standards of the degree in question are equivalent in both the distribution of academic subject matter and in scholarship achievement requirements to those maintained at the University of Hawaii; and (2) that the student can be accommodated in the field in which he wishes to study.

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

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

Application.* Application forms and specific graduate program information should be obtained directly from departmental offices well in advance of the application deadline. (For names of departments refer to the graduate fields of study listing in this catalog.) Letters should be addressed to the appropriate department, University of Hawaii, Honolulu, Hawaii 96822. For general graduate admissions information, write to the Graduate Division Admissions Office, University of Hawaii, 2540 Maile Way, Honolulu, Hawaii 96822.

Unless he has a distinguished overall academic record at the conclusion of his junior (third) year, an undergraduate applicant should apply after completion of at least the first semester or first quarter of his senior (last and final) year. Such students are advised to heed the early deadlines for the various examinations required for admission. Arrangements for taking the TOEFL, GRE, ATGSB, etc., should be made well in advance of the application deadlines.

If yearly examination results or grade reports are not available, and where the student's performance is rated only after he passes the final examination (i.e., first class honours, second class honours, upper division, etc.), the student should apply after he completes his degree. This applies to applicants from British universities, some Australian universities, the University of Hong Kong, Nanyang University, University of Singapore, to name a few. Students from the University of Malay should apply after completion of their bachelor's degree even though they are able to present grades prior to the final examination.

Admission for classified graduate status is limited to the fall and spring semesters. In-state teachers and librarians who plan to work toward their M.Ed. and M.L.S. degrees by attending summer sessions only should consult the Graduate Division Admissions Office for information about application procedures.

Deadlines. Applications for admission to the Graduate Division are accepted from November 1 to March 1 for the fall semester, from May 1 to September 1 for the spring semester. The application, transcripts, and other supporting documents should be sent to the Graduate Division Admissions Office and postmarked no later than March 1 for the fall semester, September 1 for the spring semester.

Application Requirements. Students applying for admission to the Graduate Division must submit the following:

Graduates of U.S. Universities:
1. Application form.
2. Transcripts (two official copies) from each institution attended.
3. $10 application fee.
4. Application fee form.
5. Residence information form (for tuition purposes).
6. Records of examinations (GRE, MAT, etc.) as required by certain fields (see special requirements under field listings).
7. Letters of recommendation as required by certain fields.

*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

*Nontraditional Grading

If all or more than 25% of a student's undergraduate course work has been graded under a nontraditional grading system (i.e., pass/fail, credit/no credit, S/U, etc.):
1. the transcripts must be accompanied by official course performance reports, i.e., faculty evaluations (2 copies each of transcripts and performance reports).
2. the applicant must take the aptitude test of the Graduate Record Examination and submit the results to the department to which he is applying.

Graduates of Foreign Universities (non-U.S.):
1. Application form.
2. Transcripts (two official copies) from each institution attended.
3. $10 application fee.
4. Application fee form.
5. Residence information form (for tuition purposes).
6. Records of examinations (GRE, MAT, ATGSB, etc.) as required by departments (see special requirements under field listings).
7. Letters of recommendation as required by certain fields.
8. Results of Test of English as a Foreign Language.

Note: Foreign students are not accepted as unclassified students.

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

For Admission in: Test must be taken no later than:
Jan. (Spring) 1974 June 4, 1973
Sept. (Fall) 1974 January 1974

Completed registration forms to take TOEFL must be in the office of the Educational Testing Service (ETS) at least five weeks before the test date. Students who wish to take TOEFL in Hong Kong, India, Nepal, or Taiwan must write to the address designated below.

In Hong Kong:
Education Department
Examinations Section
Canton Road Government Offices
393, Canton Road, 11th Floor
Kowloon, Hong Kong

In India and Nepal:
Test of English as a Foreign Language
Bureau of Educational Research
Ewing Christian College
Allahabad 3. U.P., India

In Taiwan:
Language Center
21-1, Hsu-chow Road
Taipei, Taiwan (100)
Republic of China

Students who wish to take TOEFL in any country except Hong Kong, India, Nepal, or Taiwan should obtain the TOEFL Bulletin of Information for Candidates, International Edition. Copies of this Bulletin and the Registration Form may be obtained in a number of cities outside the United States. They are generally available at American embassies and consulates, the United States Information Service (USIS). United States educational commissions and foundations abroad, and binational centers. In addition, several private organizations distribute TOEFL Bulletins, amongst them (1) the Institute of International Education (IIE) in Nairobi, Kenya; Paris, France; and Lima, Peru; (2) the African-American Institute (AAI) in Dar es Salaam, Tanzania; and Lagos, Nigeria; (3) the American Friends of the Middle East (AFME) in Tehran, Iran; Amman, Jordan; Beirut, Lebanon; Tangier, Morocco; and Cairo, Egypt; and (4) the American-Korean Foundation in Seoul, Korea.

Students who cannot obtain locally a TOEFL Bulletin of Information for Candidates, International Edition and Registration Form should write for them well in advance to:
Test of English as a Foreign Language
Box 899
Princeton, New Jersey, U.S.A. 08540

Please do not write to the University of Hawaii for information on TOEFL.

ENTRANCE EXAMINATIONS

As a service to in-state students, application forms for the GRE and ATGSB are usually available at the Counseling and Testing Center. University of Hawaii, 1615 East-West Road (subject to relocation), Honolulu, Hawaii 96822. All out-of-state students must write to the address designated below.

Graduate Record Examination (GRE). The GRE is required for admission in a number of fields of study. In some fields it is recommended but not required. The Graduate Division requires the aptitude test of the GRE of all students who have done their undergraduate work under a nontraditional grading system. For requirements of the individual graduate fields of study, consult the relevant field-of-study descriptions in this catalog. Students taking the test must submit

*Applies to UH New College students.
†See p. 14 for information relating to the University’s English Language Institute, and its role in testing and evaluating the English proficiency of foreign students.
completed registration forms and test fees to the Educational Testing Service at least one month prior to the examination date. Applicants may request forms directly by writing to Graduate Record Examinations, Educational Testing Service, Box 1502, Berkeley, California 94701; or Box 955, Princeton, New Jersey 08540.

Test dates, test fees and registration deadlines are posted on graduate school bulletin boards on all university campuses in the U.S. The GRE will be administered in January, February (U.S. only; Aptitude test only, no Advanced test), April, June, October, and December. ETS should be directed to forward the test results directly to the department to which the student is applying for admission. GRE scores over five years old are not acceptable.

The Educational Testing Service offers special administrations of the GRE in a few major cities in the U.S. for students who are unable to take the examinations on the regular testing dates. The student should check with the testing center at his university or in his city for information about this. The GRE may be taken twice in one year under this special program—once during the period from October through March and once from April through September. Although repeating a test is restricted in the Specials, a student may register again at any time for a regular GRE administration. There is an additional charge of $5.00 above the regular test fees for registering at a special center.

In-state students taking the special test at the University of Hawaii should submit the registration forms and test fees directly to the Counseling and Testing Center, University of Hawaii, 1615 East-West Road, Honolulu, Hawaii 96822, in advance of the test date. Forms are available at the Counseling and Testing Center.

The following testing deadlines must be observed if the GRE is required for admission:

For Spring 1974: Test must be taken
No later than June 1973.

For Fall 1974: Test must be taken
No later than January 1974 (outside of U.S.);
February 1974 (U.S. only).

The Advanced Test of the GRE is not given in February.

Admission Test for Graduate Study in Business (ATGSB). The ATGSB is required of every applicant for admission to the MBA program in business administration. The test is given five times a year—in November, February, April, June, and August—in the United States, Canada, the West Indies, and the Canal Zone. In foreign centers, the test is administered in November, February, and April.

In-state students may obtain the Bulletin of Information and registration forms from the MBA Office, College of Business Administration, or the Counseling and Testing Center, University of Hawaii, 1615 East-West Road, Honolulu, Hawaii 96822. Out-of-state students should write directly to ATGSB, Educational Testing Service, Box 966, Princeton, New Jersey 08540, for registration forms. The completed registration forms and test fees must be submitted to the Educational Testing Service at least one month prior to the examination date. Results of the test should be sent, at the applicant’s request, to the MBA Office, College of Business Administration.

Since applications are not processed if the ATGSB is not taken on time, the following testing deadlines should be strictly adhered to:

For Spring 1974: Test must be taken
No later than August 1973
(Applicants from U.S., Canada, West Indies, and the Canal Zone).
No later than April 1973
(All others taking the test at foreign centers).

For Fall 1974: Test must be taken
No later than February 1974.

Miller Analogies Test (MAT). In-state students who are required to take the MAT should contact the Counseling and Testing Center for specific test dates. The MAT is usually administered once a month. There is no need for preregistration. A fee of $5.00 is charged to University of Hawaii students, and $7.00 to nonstudents. Actual testing time is 50 minutes. 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.

CHANGE IN FIELD OF STUDY

A graduate student who wishes to change his field of study may apply for a change by submitting a change in field application with a $10.00 fee to the Graduate Admissions Office within the following dates:

Nov. 1 to March 1—
for the next fall semester

May 1 to October 10—
for the next spring semester

A new student may apply for a change in field no earlier than four weeks after his first semester of enrollment as a classified student but no later than the above-mentioned deadline. No change is permitted for any student within his current semester of enrollment.

The new (prospective) field will review the student’s application for a change along with new applications for the semester in question. Previous acceptance by a field of study does not guarantee acceptance by another field.

CLASSIFICATION OF STUDENTS

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

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

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

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

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

UNCLASSIFIED STUDENTS

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

To be considered for admission as a classified graduate student, the applicant must have earned a B average (3.0 grade-point ratio) for all postbachelor 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.

REGISTRATION AND CREDITS

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

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

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

8 credits, including 2 or more graduate courses (courses numbered 600 and above)
9 credits, including 1 graduate course
12 credits, undergraduate courses exclusively

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

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 two weeks following regular registration. See Calendar, “Last day to register for credit.”

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

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

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

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

To withdraw from all courses, a student must obtain a complete withdrawal form from the office of admissions and records, Bachman 125, obtain the necessary signatures as indicated on the form, and turn in the completed form to the treasury office, Bachman 110.

A student wishing to withdraw from a course must do so by the deadlines specified in the calendar (Friday, September 21, for the fall semester; Friday, February 8, for the spring semester). He will receive a grade of W (withdrawal, not failing). After the last date for withdrawals, a student may receive a grade of W if (and only if) he completely withdraws from the University with the approval of the Graduate Division.

If a student ceases to attend classes without officially withdrawing, the instructor may award any one of the following final grades: A, B, C, D, or F.

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

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

Graduate Credit for Seniors. Seniors at the University of Hawaii may earn credit toward an advanced degree for some courses completed during their last semester as undergraduates provided (I) that the courses taken are in excess of
the requirement for the bachelor's degree and (2) that such courses may be used to fulfill requirements in the major field. To obtain such credit requires written approval of the dean of the appropriate undergraduate college and the Graduate Division when registering for the course.

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

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

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

**COURSE NUMBERS**

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

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

**CREDITS, GRADES, AND EXAMINATIONS**

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

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

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

An I is given to a student who has failed to complete a small but important part of a semester’s work before the semester grades are determined, if the instructor believes that the failure was caused by conditions beyond the student’s control and not by carelessness and procrastination. Each student receiving an I should contact his professor to determine the steps to be taken to remove the I. The deadline for removing an I received in the first semester is the Easter recess of the following semester; for removing an I received in the second semester or the summer session, the deadline
courses in the College of Business Administration, one summer session is equal to one semester.

In special cases, 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 computing the GPR if a petition, filed by the student and recommended for approval by the chairman of the graduate faculty, is approved by the Dean of the Graduate Division. If these grades are so excluded, the concomitant course credits may not be counted toward fulfillment of requirements for graduate degrees. Any such waiver will not alter the official University record of student grades and grade-point ratios.

No work may be transferred from another institution unless the grade is B or higher (exception: EWC grantees on study tour, in which all credits of C or better will be transferred). In computing the GPR of a student who retakes a course in which he received a grade of C, D, or F, all grades in that course will be included.

These new rules apply: (1) to all students who enter the University during the Fall 1973 semester and thereafter; and (2) to all students previously enrolled, who would benefit by application of the new rule.

Special nondegree graduate students are not subject to the B-average rule.

WARNING: Students transferring from either Plan A or Plan B to Plan C must have a minimum GPR of 3.0 in all courses completed (300-499, 600-799) as well as in all graduate (600-799) courses completed. Credits taken under the Credit-No Credit Option (except 699/799) while under Plan C will not be counted toward meeting degree requirements for either Plan A or B.

DIPLOMAS

An application for a diploma must be filed at the beginning of the semester in which the student expects to complete his degree requirements. Application forms should be obtained at the Graduate Division from self-service racks outside Spalding 354, and fees paid at the treasury office. Bachman 110.

DEGREE CHECKS

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

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

CONFERRING OF DEGREES

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

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

TRANSCRIPTS

Transcripts may be obtained from the admissions and records office, Bachman 125.

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)
- Classics
- Drama and Theatre
- Economics
- English
- English as a Second Language
- French
- Geography
- German
- History
- Linguistics
- Mathematics
- Music
- Pacific Islands Studies
- Philosophy
- Political Science
- Psychology
- Russian
- Sociology
- Spanish
- Speech-Communication

The Master of Science is offered in:
- Agricultural Economics
- Agricultural Engineering
- Agronomy and Soil Science
- Anatomy and Reproductive Biology
- Animal Sciences
- Astronomy
- Biochemistry
- Biophysics
- Botanical Sciences
- Chemistry
- Civil Engineering
- Electrical Engineering
- Entomology
- Food Science
- Genetics
- Geology and Geophysics
- Horticulture
- Information and Computer Sciences
- Mechanical Engineering
- Meteorology
- Microbiology
- Nursing
- Nutrition
- Ocean Engineering
- Oceanography
- Pharmacology
- Physics
- Physiology
- Public Health
- Speech Pathology and Audiology
- Zoology

The Master of Education is offered in:
- Educational Administration
- Educational Psychology
- Educational Communications
- Elementary Education
- Educational Foundations
- Secondary Education

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

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

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

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

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

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

The Master of Urban and Regional Planning is offered through the Pacific Urban Studies and Planning Program. It is a multidisciplinary program with options in specializations in the following areas:
- Urban and Regional Systems Planning
- Public Policy Planning
- Development Planning

Residence

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

Language Requirements

At the option of the graduate field of study, the intended candidate for the master's degree may be required to demonstrate comprehension of one or more foreign languages. For specific language requirements in particular fields of study, see the appropriate section listed alphabetically under "Graduate Fields of Study" in this bulletin.

Foreign language reading proficiency examinations in East Asian languages, European languages, and Indo-Pacific languages administered by the respective departments are held three times a year coinciding with the Educational Testing Service test dates (except the summer administration). Announcements regarding these tests are circulated by the Graduate Division to the graduate fields of study for posting on bulletin boards three times a year, usually in September, January, and March.

Students in the following fields of study planning to take the French, German, or Spanish examinations must take the ETS Graduate School Foreign Language Tests administered by the Counseling and Testing Center on campus four times a year:
- Chemistry
- English
- Geography
- Geology & Geophysics (Ph.D. only)
- History
- Linguistics
- Meteorology (Ph.D. only)
- Microbiology
- Oceanography
- Sociology
- Zoology

The GSFLT will be administered on the following dates during 1973-74:

**DEADLINE DATES**

<table>
<thead>
<tr>
<th>Test Date</th>
<th>Penalty Date*</th>
<th>Final Closing Date†</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 27, 1974</td>
<td>March 21, 1974</td>
<td>March 28, 1974</td>
</tr>
<tr>
<td>June 15, 1974</td>
<td>July 3, 1974</td>
<td>July 11, 1974</td>
</tr>
</tbody>
</table>

Deadline dates are dates of receipt at ETS. They are not postmark dates.

*Last day for receipt of Registration Form without $3.50 penalty fee.
†Last day for guaranteed registration or for change in registration.
Time Allowed

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

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

Transfer of Credits

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

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

Progress Report Forms

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

Rules and Requirements

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

 PLAN A (THESIS)

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

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

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

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 and recommendation for membership of the thesis committee by January 15 for May graduation, May 15 for December graduation, and by February 1 for those who expect to complete their degree requirements during the summer session. The student may then enroll in the thesis research course (800) at the beginning of the next academic term. Students must register for Thesis 800 during the announced registration period. Students given special permission by the Graduate Division to register after the announced registration period will be assessed a late registration fee or a change of registration fee, whichever is applicable.

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

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

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

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

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

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

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

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

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

Summary of Procedure

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

PLAN B (NONTHESES)

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

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

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

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

Examinations

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

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

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

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

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

Summary of Procedure

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

PLAN C (EXAMINATIONS)

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

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

Examinations

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

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

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

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

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

Summary of Procedure

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

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

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

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

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

Residence

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

Time Allowed

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

Credits

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

Language Requirements

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

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

For information on language test administrations, see "Language Requirements" in previous section.

Doctoral Committee

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

Examinations

Doctoral candidates must pass the following examinations:

Qualifying Examination (optional to fields of study)

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

Comprehensive Examination

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

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

Students who fail the comprehensive examination may
repeat it once at the discretion of the graduate faculty con-
cerned. A student who fails the second examination is irre-
 vocably dropped from the program.

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

Final Examination

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

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

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

Dissertation

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

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

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

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

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

Copies of the completed dissertation must be submitted
to committee members at least four weeks prior to the date
of the final oral examination. The original and first carbon
copies must be deposited with the Graduate Division by
the deadline specified in instructions issued to all candidates
at the beginning of the session in which the degree is con-
ferred. Additional bound copies may be required by indi-
vidual 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 ac-
ceptable to a majority of the committee. The committee
members express their approval on the signature page of
the dissertation.

Candidates must be registered in the appropriate thesis
research course (800) during the entire term in which the
work for the degree is completed. Candidates who accumu-
late 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.

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; admis-
   sion to candidacy. (Form II submitted, with copy to stu-
   dent.)
4. Appointment of doctoral committee. (Form III submit-
   ted, with copy to student.)
5. Approval of dissertation proposal. (Form IV submitted,
   with copy to student.)
6. Certification of proficiency in second foreign language,
   where required; comprehensive examination. (Form V
   submitted.)
7. Diploma application, payment of graduation and disserta-
   tion binding fee.
8. Abstract of dissertation filed with the Graduate Division,
   if applicable.
9. Final examination. (Form VI submitted.)
10. Copies of dissertation filed in Graduate Division.
11. Granting of the degree.

The above order is that usually followed, but at the plea-
sure 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 comprehen-
sive examination.
FACULTIES, REQUIREMENTS, AND COURSES

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

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

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

Agricultural Economics

Graduate Faculty
F. S. Scott, Jr., Ph.D. (Chairman)—market development
R. N. Anderson, Ph.D.—resource economics
H. L. Baker, Ph.D.—resource economics
J. R. Davidson, Ph.D.—production and marine economics
P. V. Garrod, Ph.D.—marketing and statistics
C. Gopalakrishnan, Ph.D.—resource and marine economics
J. T. Ishida, Ph.D.—marketing
J. T. Keeler, M.S.—farm management
N. G. M. Luyxk II, Ph.D.—agricultural policy
P. F. Philipp, Ph.D.—production and international economics
H. Spielmann, Ph.D.—marketing and agricultural policy
W. J. Staub, Ph.D.—international economic development
C. P. Wilson, Ph.D.—marketing and agricultural policy
H. Yamauchi, Ph.D.—resource economics

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

The department offers a master's degree program under Plan A (thesis) or Plan B (nonthesis), and a program leading to the Ph.D. If the master's degree is expected to be a terminal degree, the student is encouraged to pursue Plan A.

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

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

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

1. Economic theory, emphasizing micro-economics, macro-economics and history of economic thought.
2. Quantitative methods, including research tools, statistics, and econometrics.
3. Specialized field in agricultural or resource economics.

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

Graduate Faculty

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

Affiliate Faculty
A. L. Myers, M.S.—harvesting equipment

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

Agricultural engineering courses available for the graduate program are listed below. Courses from related fields of engineering, agriculture and sciences may also be utilized to fulfill the minimum requirement of 21 credits. Candidates may specialize in fruit and nut harvesting equipment, fruit and nut processing equipment, machinery management, soil dynamics, precooling and storage of fresh product, surface hydrology, irrigation engineering, environment control engineering, and physical properties of biological materials. Required courses are marked with an asterisk.

AGRICULTURAL ENGINEERING (AgEng)

333 Computer Programming for Bio-science (3)
351 Mechanization Principles & Practices (3)
351L Mechanization Laboratory (2)
435 Irrigation Principles and Practices (3)
499 Directed Research (v)
622 Experimental Methods in Cause-Effect Modeling (3)
631 Analysis of Implement Design (3)
635 Farm Irrigation System Design (3)
638 Systems Analysis in Bio-sciences (3)
647 Methods of Agricultural Engineering (3)
699 Directed Research (v)
*700 Seminar (1)
*800 Thesis Research (v)

Agronomy and Soil Science

Graduate Faculty

W. G. Sanford, Ph.D. (Chairman)—plant nutrition
D. P. Bartholomew, Ph.D.—crop physiology
P. C. Ekern, Ph.D.—soil management, agricultural meteorology
S. A. El-Swaify, Ph.D.—soil salinity, physical chemistry
R. L. Fox, Ph.D.—soil fertility and chemistry, soil management
R. E. Green, Ph.D.—soil-pesticide interactions, soil physics
H. Ikawa, Ph.D.—soil mineralogy, soil genesis and classification
R. C. Jones, Ph.D.—clay mineralogy, electron microscopy, instrumental analysis
Y. Kanehiro, Ph.D.—soil chemistry, fertility
D. L. Plucknett, Ph.D.—crop management, weed control, soil fertility
P. P. Rotar, Ph.D.—plant breeding
J. A. Silva, Ph.D.—soil fertility and soil chemistry, statistics
L. D. Swindale, Ph.D.—soil genesis and classification, physical chemistry
Y. N. Tamimi, Ph.D.—forest soils, soil fertility, pasture management
J. R. Thompson, Ph.D.—crop production, pasture management
G. Uehara, Ph.D.—soil physics, mineralogy: soil management
U. Urata, Ph.D.—cytogenetics, breeding of grasses and sugar cane
A. S. Whitney, Ph.D.—pasture management, forage physiology
H. Y. Young, M.S.—plant chemistry, nutrition, pesticide chemistry

Affiliate Graduate Faculty

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

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

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

A general examination will be required of all intended M.S. candidates during the first semester of enrollment. The examination will consist of two parts: a basic examination in the natural and physical sciences, and selected questions representing major agronomy and soil science disciplines. All M.S. candidates must register for seminar in agronomy or soil science. The Plan A (thesis) program is for M.S. candidates. A minimum of 21 course credits is required, including a minimum of 12 credits, in courses numbered 600-799. No more than 2 credits in directed research (Agronomy 699, Soil Science 699) may be allowed toward the degree under this plan.

The Plan B (nonthesis) program is intended only for 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 thesis program committee will decide (a) whether the student passes or fails, and (b) if he passes, whether or not he will be allowed to continue for the Ph.D.

The Plan C option is limited to superior students. Selection of candidates will be based upon their previous academic records, an interview, and level of performance in the general examination. The student will be required to take courses, present reports and to take examinations as outlined by the program committee. Upon completion of program requirements the student will be required to take a written and oral final examination. The thesis program committee will then decide (a) if the student passes or fails and (b) if he passes, whether or not he will be allowed to continue for the Ph.D. in agronomy and soil science.
The degree of Ph.D. in agronomy and soil science is awarded only for scholarly achievement. The dissertation, which is a significant original contribution of basic knowledge in the candidate’s field, is required. Only students with excellent academic records in predoctoral programs will be accepted into the program. For the soil science option, mathematical preparation at least to the level of differential and integral calculus is strongly recommended.

Ph.D. candidates will be required to take a predoctoral qualifying examination composed of four subject matter areas, the areas to be designated by the graduate program committee and the adviser on the basis of the candidates’ stated areas of interest. If the intended candidate receives his M.S. from this department, then his M.S. committee will decide whether or not he may be accepted as an intended Ph.D. candidate. The committee will further decide if he will be required to take the qualifying examination.

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

Courses in the major field are to be selected from those listed below. Supplementary courses in related fields will be required as determined by the area of specialization. Those in the agronomy option may specialize in tropical crop production, crop physiology, weed science, 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 salinity, soil management, soil conservation, soil fertility and soil biology.

AGRONOMY (Agron)

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

SOIL SCIENCE (Soils)

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

American Studies

Graduate Faculty

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

Cooperating Faculty

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

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

Recognizing the unique nature of the program and the difficulties of adequate undergraduate preparation, especially for students from Asian countries, departmental requirements for intended candidates are flexible. Candidates should present a record indicating a wide range of study in the humanities and the social sciences or be willing to undertake additional courses or readings in those fields before acceptance as degree candidates. The GRE aptitude scores are required before requests for admissions to either the M.A. or Ph.D. programs are considered by the department. No general examination is required.

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

Intended candidates for the Ph.D. degree are expected to possess the M.A. degree in American studies or its equivalent. An applicant should have a scholarly attainment of an unusually high order to work within a multidisciplinary program and both written and oral preliminary examinations will be required.

The program of study will not require a specific group of courses other than four seminars, American Studies 710, 730, 740, 750. The seminars will cover four fields in American civilization and the examinations given at their conclusion will be considered as part of the preliminary examinations.
Candidates will be admitted into the seminars only after the advisory committees have agreed that candidates have completed their individually planned prerequisites of other courses and readings. The language requirements for admission to candidacy will be the minimum requirements set by the Graduate Division unless the candidate’s advisory committee sets additional requirements.

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

**American Studies (AmSt)**

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<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>419</td>
<td>American Environment: Topics</td>
<td>3</td>
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<tr>
<td>420</td>
<td>American Subcultures: Survey</td>
<td>3</td>
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<td>421</td>
<td>American Subcultures: American Indians</td>
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<td>422</td>
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<td>429</td>
<td>American Subcultures: Topics</td>
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<td>430</td>
<td>American Institutions: Survey</td>
<td>3</td>
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<td>431</td>
<td>American Institutions: Leaders and Movements</td>
<td>3</td>
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<td>432</td>
<td>American Institutions: Radial Tradition</td>
<td>3</td>
</tr>
<tr>
<td>439</td>
<td>American Institutions: Topics</td>
<td>3</td>
</tr>
</tbody>
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**Anatomy and Reproductive Biology**

**Graduate Faculty**

- J. C. Hoffmann, Ph.D. (Chairwoman)—control of reproductive cycles, endocrinology of reproduction, neuroendocrinology
- G. D. Bryant, Ph.D.—endocrinology of reproduction, radioimmunoassay
- V. J. DeFeo, Ph.D.—embry-uterine relationships, endocrinology and physiology of reproduction, electron microscopy, human sexuality
- M. Diamond, Ph.D.—sex behavior, human sexuality, endocrinology of reproduction
- P. A. Jacobs, D.Sc.—human cytogenetics
- V. L. Jacobs, Ph.D.—neural aspects of reproduction
- R. G. Kleinfeld, Ph.D.—cellular and developmental biology, cytochemistry, electron microscopy
- R. J. Teichman, Ph.D.—comparative sperm morphology, biological membranes, electron histochemistry
- R. Yanagimachi, Ph.D.—sperm capacitation, ovum fertilization

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

The GRE aptitude and the advanced test in biology or chemistry are required before requests for admission are considered.

ANATOMY (Anat)

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

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

BIOMEDICAL SCIENCE (Biomd)

601 Cell Structure and Function (2)
602 Endocrinology and Reproduction (2)
603 Organ Structure and Function (5)
604 Neuroscience (4)
605 Microanatomy Laboratory (2)
606 Endocrinology and Reproduction Laboratory (1)
607 Physiology Laboratory (1)

Animal Sciences

Graduate Faculty

R. W. Stanley, Ph.D. (Chairman)—ruminant nutrition
C. C. Brooks, Ph.D.—non-ruminant nutrition
C. M. Campbell, Ph.D.—ruminant nutrition
R. B. Herrick, Ph.D.—poultry physiology
J. H. Koshi, Ph.D.—dairy management
R. M. Nakamura, Ph.D.—veterinary microbiology
A. L. Palafox, Ph.D.—poultry nutrition
D. Reimer, Ph.D.—genetics
E. Ross, Ph.D.—poultry nutrition
D. W. Vogt, Ph.D.—genetics
O. Wayman, Ph.D.—reproductive physiology

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

Thesis research is required for animal sciences graduate students and carries 9 credits.

ANIMAL SCIENCES (AnSc)

445 Animal Breeding (3)
451-452 Physiology of Domestic Animals (4-4)
453 Animal Diseases and Their Control (3)
641 Seminar in Animal Sciences (1)
642 Ruminant Nutrition (2)
643 Physiology of Reproduction (3)
652 Quantitative Genetics (3)
699 Directed Research (v)
800 Thesis Research (v)

Anthropology

Graduate Faculty

S. T. Boggs, Ph.D.—culture and personality, education and anthropology, methods
A. G. Dewey, Ph.D.—social anthropology, culture change; Indonesia, Polynesia, Melanesia
B. R. Finney, Ph.D.—social and cultural change; Pacific
R. A. Gould, Ph.D.—archaeology, ethnoarchaeology; Australia, North America
P. B. Griffin, Ph.D.—archaeological theory, ecological anthropology; North America, Polynesia
J. M. Hanna, Ph.D.—physical anthropology
S. A. Howard, Ph.D.—social and psychological anthropology, ethnoscience; Polynesia
T. Lebra, Ph.D.—behavior and social systems, religion; Japan
W. P. Lebra, Ph.D.—social anthropology, religion; East Asia
R. W. Lieban, Ph.D.—social anthropology, medical anthropology; Philippines, Southeast Asia
K. L. Luoma, Ph.D.—ethnology and folklore; Polynesia and Micronesia

T. W. Maretzki, Ph.D.—psychological and applied anthropology, culture change; East Asia
D. L. Oliver, Ph.D.—social anthropology; Oceania
M. Pietrusewsky, Ph.D.—physical anthropology
W. G. Solheim, Ph.D.—archaeology; Southeast Asia
H. D. Tuggle, Ph.D.—archaeology, theory, ecology, animal biosocial evolution; New World, Pacific Basin

Emeritus

L. E. Mason, Ph.D.—applied anthropology, education, culture change; Micronesia, Pacific Islands

Affiliate Faculty

K. E. Emory, Ph.D.—archaeology, ethnology; Polynesia
R. W. Force, Ph.D.—culture change; Oceania
Y. Sinoto, D.Sc.—archaeology; Polynesia and Japan
D. Yen—ethnobotany; Oceania, Southeast Asia

Intended candidates for the M.A. or Ph.D. need not have an undergraduate background in anthropology. All applicants must submit to the department Graduate Record Examination aptitude scores and three letters of recommendation at the time of application. Lack of previous training in anthropology may result, however, in study to fill gaps in knowledge, and before being considered for candidacy for an advanced degree a student must present evidence of having passed with a B or better at least one undergraduate course in archaeology, physical anthropology, social or cultural anthropology, and linguistics. Following, or concomitant with, makeup of any undergraduate deficiencies, the student is expected to enroll in core graduate seminars covering major subfields of anthropology (social-cultural anthropology, physical anthropology, archaeology). A passing grade of B or better in each of the core seminars is required for admission to candidacy. A student who has already done advanced work in a subfield covered by the core seminars will be permitted to take an examination, and if his performance is judged adequate he will not be required to take the core seminar in that subfield. The M.A. program is intended to assure the graduate of a broad background in major subfields of anthropology, while the Ph.D. program provides for specialization in depth.

Admissions will be considered for the fall semester only.

M.A.

The M.A. candidate has a choice of a thesis (Plan A) or a nonthesis (Plan B) program. Plan A consists of 24 semes-
Ph.D. candidates must fulfill the requirements for an M.A. degree in anthropology as a prerequisite. The Ph.D. program has no unit requirements apart from the Graduate Division requirement of three semesters of full-time work. No specific course is required. The student will work out with his advisory committee a program to accomplish the following goals: a broad knowledge of one sub-field of anthropology (physical anthropology, archaeology, and social-cultural anthropology, the latter including psychological anthropology and linguistic anthropology); an acquaintance with a second sub-field within anthropology or another discipline: deep and critical knowledge of the topic which is most relevant to the research which the student plans to carry out for the dissertation; a thorough familiarity with the relevant literature concerning any geographical region in which the student may plan to do research for his dissertation; the capacity to design research projects, including an ability to formulate problems clearly, to use concepts creatively, to employ appropriate methods in data collection, and to relate empirical data to theoretical constructs; and the capacity to write clearly and cogently and make effective oral presentations.

A student will take a graduate course (other than a reading course) from at least 4 different members of the department, and also some work in a second sub-field within anthropology or another discipline. Students will be encouraged to undertake faculty supervised research prior to submitting a dissertation proposal.

Before undertaking dissertation research a student will submit a detailed proposal to his doctoral advisory committee. The committee may amend the proposal and suggest further ethnographic, theoretical, or methodological areas which the candidate should investigate. When the student and his committee are satisfied that he is sufficiently prepared for dissertation research, a comprehensive oral examination will be conducted to test competence in his specializations and to evaluate his ability to formulate and communicate ideas effectively. He is also expected to be familiar with the historical background of theoretical ideas in his specialization, and to appreciate the significance of current issues in anthropology. This examination will be conducted by the student's doctoral advisory committee. All members of the department faculty are invited to attend. Upon submission of the final draft of his dissertation a candidate will, under present Graduate Division requirements, present an oral defense of the dissertation.

ANTHROPOLOGY (Anth)

300 Study of Contemporary Problems (3)
305 History of Anthropology (3)
306 Foundations of Anthropological Method (3)
310 Human Evolution (3)
320 Archaeological Theory and Interpretation (3)
330 Social Organization (3)
340 World Ethnography (3)
350 Oceania (3)
355-356 Asia (3-3)
370 Ethnographic Field Techniques (3)
380 Archaeological Field Techniques (3)
381 Archaeological Laboratory Techniques (3)
384 Human Osteology (3)
400 Anthropological Statistics (3)
414 Introduction to Linguistic Anthropology (3)
415 Ecological Anthropology (3)
416 Economic Anthropology (3)
417 Political Anthropology (3)
418 Culture and the Individual (3)
419 Oral Art (3)
422 Comparative Religion (3)
423 Social and Cultural Change (3)
425 Medical Anthropology (3)
445 Regional Ethnology (3)
(1) Mainland Southeast Asia
(2) Island Southeast Asia
(3) Micronesia
(4) Polynesia
(5) Melanesia
(6) Other to be announced
460 Regional Archaeology (3)
(1) Asia
(2) Europe, Africa, and Near East
(3) North and South America
(4) Other to be announced
480 Anthropological Applications (3)
(1) Development
(2) Health
(3) Education
481 Applied Anthropology (3)
483-484 Japanese Culture and Behavior (3-3)
485-486 Peoples of Hawaii (3-3)
488-489 Chinese Culture and Society (3-3)
620 Theory in Social and Cultural Anthropology (3)
(1) Kinship
(2) Cognitive Systems
(3) Religion
(4) Political Institutions
(5) Law and Social Control
(6) Economics
(7) Ecology
(8) Other to be announced
630 Theory in Physical Anthropology (3)
632 Field Study of Population (3)
635 Culture History (3)
640 Method and Theory in Archaeology (3)
(1) Prehistory
(2) Environmental Archaeology
(3) Other to be announced
699 Directed Reading or Research (v)
710 Seminar in Research Methods (3)
712 Data Processing in Archaeology (3)
750 Research Seminar (3)
(1) Archaeology
(2) Linguistics
(3) Ethnography
(4) Social Anthropology
(5) Psychological Anthropology
(6) Biological Anthropology
800 Thesis Research (v)
Architecture

Graduate Faculty

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

Affiliate Faculty

T. Creighton, B.A.—architectural and planning theory
F. Haines, M. Arch.—professional architecture practice
W. Merrill, M. Arch.—urban/regional design
A. Yee, M.E.—architectural engineering

Department Requirements

Candidates for the master's degree are accepted from three categories.

Option 1: Holders of a five-year B. Arch. degree or equivalent. These students are admitted immediately to candidacy.

Option 2: Holder of a bachelor's degree in pre-architecture or an equivalent pre-professional degree. These students are required to complete post-graduate preparatory work before becoming candidates.

Option 3: Holders of bachelor's degree in a major other than architecture. These students are required to complete undergraduate preparatory work before becoming candidates.

Applicants must, when applying to the Graduate Division, simultaneously submit to the department of architecture:

(a) Indication of major area of study: architectural design (applications for the Architectural Design Emphasis will be accepted for fall enrollment only), architectural and environmental engineering, urban/regional design or tropical and development studies.

(b) Samples of work done in intended majors: e.g., black and white or colored photographs in brochure form. Brochures should not exceed 12 by 18 inches. Brochures, however, are not required of applicants holding a bachelor’s degree in a major other than pre-architecture or equivalent until completion of graduate preparatory study.

(c) Results of Architectural School Aptitude Test administered by the Educational Testing Service, Princeton, New Jersey 08540.

In addition to meeting departmental and Graduate Division academic requirements and prior to admission to candidacy, applicants are required to submit documented evidence of completion of 600 hours of supervised work in the offices of practicing architects, engineers, landscape architects, planners, or 6 credits of Arch 488, or a combination of these.

Requirements for Graduation

Completion of 30 credit hours of course work and 6 credit hours of thesis research. Applicants admitted under Options 2 and 3 are required to complete additional preparatory studies and course work. A minimum of 12 credit hours exclusive of thesis research must be earned in courses numbered 600 and above. A maximum of 2 credit hours may be earned in directed work (Arch 699).

Permanent residents of the U.S.A. or students intending to become permanent residents of the U.S.A. who have not already done so, must complete departmental requirements for public health and safety and professional practice.

Accreditation

The department is accredited by the National Architectural Accrediting Board.

ARCHITECTURE (Arch)

331 Arch "A": Housing/Single Activity Buildings (3)
332 Arch "B": Multiple Activity Buildings (3)
333 Arch "C": Building Complexes (3)
376 Asian Arch and Landscaping (3)
400V Special Projects in Arch (2-4 V)
401 Architectural Structures "D" (4)
402 Architectural Structures "E" (4)
411 Building Economics and Codes (3)
412 Working Drawings, Estimating & Specifications (3)
421 Environmental Control (3)
Two masters' degrees are offered: The M.A. in history of art (Plan A, thesis or Plan B, nonthesis) and the M.F.A. in studio practice (Plan A, thesis only). The history of art as well as the studio programs are concerned with the creative, the experiential, and the developmental aspects of art. An otherwise deficient or incompatible undergraduate program will mean admission on a probational basis only and will require at the discretion of the graduate faculty, additional course work for either degree.

M.A.

The M.A. is given in the fields of Asian and Pacific history of art. A minimum of 30 semester hours are required for Plan A or B. The more suitable plan will be determined by the faculty at the preliminary conference. Plan A includes a minimum of 12 semester hours of history of art courses numbered 600 and above, a maximum of 2 semester hours of Directed Work 699 and 6 semester hours of thesis 800.

Plan B consists of 30 semester hours of course work, with a minimum of 18 semester hours to be earned in history of art courses numbered 600 to 799, including Art 699 with variable credits.

For either plan, a maximum of 9 semester hours may be earned in appropriate advanced courses in other academic departments of the University as approved by the graduate adviser.

Intended candidates must present the equivalent of an undergraduate major in the history of art including 24 semester hours in the history of art 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 department recommends that intended candidates submit official scores of the Graduate Record Examination. Art 384, 385, 391 or the equivalent may be required of students as prerequisites to work towards the M.A.

M.F.A.

The M.F.A. (Plan A, thesis only) is a terminal degree in creative studio work in the visual arts. It will take a minimum of two years for a well qualified student to complete the 48 semester hours required. (As such, it is closer to the Ph.D. in character than to the M.A.) Studio specialization is required and course work includes a minimum of 18 semester hours in 600 level studio course and 6 semester hours of thesis which includes an exhibition of original work. For the M.F.A., Art 699 Directed Work, normally 3 semester hours per semester, may be taken for a total of 12 semester hours maximum of the 48 required.

Elective courses may be in any art department program or any academic department of the University for which adequate preparation is demonstrable, subject to consent of instructor and graduate adviser.

Intended candidates must present the equivalent of a B.F.A., 63 semester hours in the field of art including a sound preparation in the studio area designated by the graduate application, 18 semester hours in the history of art, and be ready to present for evaluation, a portfolio or slides as evidence of ability to do creative work of superior quality. Such material will be requested by the department only after application has been received.

Courses available for the graduate program are listed below.

ART (Art)

384 Art of Japan and Korea (3)
385 Early Chinese Sculpture (3)
391 Art of South Asia (3)
400 Special Projects in Art (v)
401 Glass Blowing (3)
402 Glass Blowing (3)
407 Advanced Photography (3)
463-464 Visual Communication (3-3)
470 Renaissance Art (3)
471 Baroque and Rococo Art (3)
472 American Art (3)
473 Contemporary Art (3)
474 Arts of the 20th Century (3)
475 Arts of the Pacific (3)
476 Primitive Art (3)
477 Primitive Art of the Pacific Rim (3)
478 Arts of Melanesia (3)
483 Applied Arts of Japan (3)
485 Applied Arts of China (3)
492 Comparative Aspects of Art (3)
495 Art of Southeast Asia (3)
496 Art and Architectural Field Studies (v)
617 Printmaking (3)
624 Painting (3)
Asian Languages

Graduate Faculty
R. M. Baumer, Ph.D. (Chairman, Graduate Field of Study)—Bengali language and literature
J. T. Araki, Ph.D. (Chairman, Department of East Asian Literature)—Japanese literature
J. DeFrancis, Ph.D. (Chairman, Department of East Asian Languages)—Chinese language
W. H. Maurer, Ph.D. (Chairman, Department of Indo-Pacific Languages)—Sanskrit and Pali
R. L. Cheng, Ph.D.—Chinese and Japanese languages
S. Dardjowidjojo, Ph.D.—Indonesian language
N. Fujioka, M.A.—Japanese language
T. W. Getting, Ph.D.—Thai language
H. I. Hsieh, Ph.D.—Chinese language
H. Ikeda, Ph.D.—Japanese literature
P. N. Jenner, Ph.D.—Cambodian language
S. J. Kim, Ph.D.—Korean literature
Y. Kusanagi, Ph.D.—Japanese language
J. S. M. Lau, Ph.D.—Chinese: modern drama and comparative literature
P. H. Lee, Ph.D.—Korean literature
Y. C. Li, Ph.D.—Chinese language
N. D. Liem, Ph.D.—Vietnamese language and literature
C. T. Lo, Ph.D.—Chinese literature
Y. W. Ma, Ph.D.—Chinese: traditional fiction and bibliography
S. O’Harrow, Ph.D.—Vietnamese language and literature
T. Ramos, Ph.D.—Filipino language and literature
D. H. Roop, Ph.D.—Thai language
H. M. Sohn, Ph.D.—Korean language
M. M. Tahara, Ph.D.—Japanese: classical literature
H. Taylor, Ph.D.—Japanese language
V. H. Viglielmo, Ph.D.—Japanese literature
L. P. H. C. Winters, M.A.—Chinese literature
J. Young, Ph.D.—Japanese language

Emeritus
F. K. Li, Ph.D.—Chinese and Thai; linguistics

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

M.A.

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

Under Plan A (thesis), a minimum of 30 hours course work, including at least 18 credit hours in the major field, plus 9 hours of thesis research is required. A minimum of 12 credits in the major field must be earned in courses numbered 600 or higher including the graduate seminar, Chinese or Japanese 750.

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

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

Ph.D.

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

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

EAST ASIAN LANGUAGES

CHINESE

Language (Chnse):
401-402 Fourth-Level Chinese (4-4)
404 Accelerated Fourth-Level Chinese (8)
421-422 Advanced Chinese Conversation (3-3)
433-434 Selected Readings in Chinese (3-3)
435-436 Introductory Classical Chinese (3-3)
437-438 Advanced Classical Chinese (3-3)
440 Chinese Composition (2)
451-452 Structure of Chinese (3-3)
453-454 Study of Chinese Characters (3)
Asian Studies

Graduate Faculty from departments of:

Anthropology Indo-Pacific Languages
Art Linguistics
Drama and Theatre Music
East Asian Languages Philosophy
East Asian Literature Political Science
Economics Religion
Geography Sociology
History

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

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

Students not having sufficient academic background for the study of Asia may be required to take, without credit toward the degree, certain preparatory courses designated by their respective area committee. 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. Applicants are required to submit two letters of recommendation in order to complete the application for admission.

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

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

Asian LANGUAGES

Language (Jpns) :

400 Intensive Advanced Japanese (16) 
401-402 Fourth-Level Japanese (4-4) 
403 Accelerated Fourth-Level Japanese (8) 
411-412 Advanced Japanese Aural Comprehension (3-3) 
421-422 Advanced Japanese Conversation (3-3) 
431-432 Selected Readings in Japanese (3-3) 
435-436 Introduction to Classical Japanese (3-3) 
440 Advanced Japanese Composition (2) 
451-452 Structure of Japanese (3-3) 
455-456 Topics in Japanese Grammar (3-3) 
457-458 Japanese Grammar: Classical (3-3) 
470 Language and Culture of Japan (3) 
471-472 Topics in Language and Culture of Japan (3-3) 
490 Reference Materials for Japanese Studies (1) 
491-492 Japanese Interpretation (3-3) 
495-496 Japanese Translation (3-3) 
631-632 History of Japanese Language (3-3) 
641-642 Contrastive Study of Japanese and English Structure (3-3) 
643-644 Methodology in Teaching Japanese as a Second Language (3-3) 
750.1 Research Seminar in Japanese—Teaching Methods (3) 
750.2 Research Seminar in Japanese—Structure (3) 
750.3 Research Seminar in Japanese—Dialects (3) 
750.4 Research Seminar in Japanese—Other topics (3) 
800 Thesis Research

Literature (JaLit) :

341-342 Readings in Contemporary Japanese Literature (3-3) 
441-442 Readings in Modern Japanese Literature (3-3) 
451 Readings in Traditional Japanese Literature (3) 
490 Reference Materials for Japanese Literary Studies (3) 
609-610 Japanese Poetry (3-3) 
611-612 Modern 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) 
623-624 Japanese Folklore (3-3) 
690 Advanced Japanese Bibliography (3) 
750 Research Seminar in Japanese Literature (3) 
800 Thesis Research
Astronomy

Graduate Faculty

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

Undergraduate preparation for admission to the graduate program in astronomy includes a minimum of 35 semester hours of undergraduate credits in physics or astronomy, some of which must be in atomic and nuclear physics, electromagnetism, mechanism, optics, and thermodynamics. An undergraduate course in introductory astronomy is recommended. Courses in mathematics through differential equations are also required. Applicants for admission must submit to the department aptitude and advanced (physics) scores.

Astronomy (Astr)

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

Biochemistry and Biophysics

Graduate Faculty

R. J. Guillory, Ph.D. (Chairman)—bioenergetics; mechanism of mitochondrial oxidative phosphorylation and membrane dependent energy linked reactions. Membrane and contractile proteins structure
N. V. Bhagavan, Ph.D.—clinical biochemistry
I. R. Gibbons, Ph.D.—biophysics, molecular biology
F. C. Greenwood, Ph.D.—biochemical endocrinology, measurement and metabolism of protein hormones and postaglandins
T. D. Humphreys, Ph.D.—cell surface molecules, contact inhibition, RNA synthesis and growth regulation
M. Mandel, Ph.D.—physiology of temperate bacteriophage; nuclear magnetic resonance
J. A. Mann, Ph.D.—biomembrane dynamics, structure and function; surface physics and chemistry; theoretical chemistry (joint appointment with Chemistry)
J. D. McConn, Ph.D.—enzyme kinetics and the catalytic function of metals
B. McConnell, Ph.D.—structure of nucleic acids
R. H. McKay, Ph.D.—physical biochemistry, biological oxidation, enzymology, protein structure
B. E. Morton, Ph.D.—biochemistry of fertilization, the control of contractility
H. F. Mower, Ph.D.—the control of protein synthesis in normal and neoplastic systems
L. H. Piette, Ph.D.—mechanism of organic and biological reactions, electron paramagnetic resonance, spin labelling of enzyme active sites, membrane structure, drug membrane interactions, chemical carcinogenesis
K. T. Yasunobu, Ph.D.—relationship of enzyme structure to function

Affiliate Graduate Faculty

R. M. Heinicke, Ph.D.—enzymology, nutrition, plant biochemistry
J. C. McIntosh, Ph.D.—clinical biochemistry

The M.S. (Plans A and B) and Ph.D. degrees are offered in both biochemistry and biophysics. The following information supplements the general requirements and procedures listed by the Graduate Division.

The department requires all applicants to submit results of the Graduate Record Examination including an advanced test, within any scientific area. A written qualifying examination (normally taken at the end of a student’s second semester in residence) is required of all students. This examination may vary in subject matter for specific candidates depending upon the degree and the option sought. For the M.S. degree in biochemistry the qualifying examination is based upon the material covered in biochemistry courses numbered 601, 602 and 613. For the M.S. degree in biophysics this examination is based on the material covered in biophysics courses numbered 601, 602 and 603.

A candidate for the Ph.D. degree must have satisfactorily completed a written qualifying examination in biochemistry as well as biophysics. Completion of these examinations allows a student to proceed to the comprehensive examination in either biochemistry or biophysics depending upon the candidate’s elected course of studies. Upon completion of the comprehensive examination the student is admitted to candidacy and permitted to enroll in Thesis Research (Bioch or Bioph 800). The comprehensive examination will take the form of an oral examination by the candidate’s doctoral committee and is based upon original research propositions and a thesis outline both submitted by the candidate.

A Ph.D. candidate joining the department with a master’s degree in biochemistry or biophysics may, upon petitioning the departmental student standing committee, be allowed to take the qualifying examination immediately upon entrance into the department. In such a case satisfactory completion of this examination will credit the student with the relevant departmental courses (see above).

For the Ph.D. degree a total of 29 credit hours of courses are required exclusive of research. A candidate for the M.S. degree (Plan A) must obtain 23 credit hours of course work in addition to 8 hours of Thesis Research (Bioch or Bioph 800) or for the M.S. degree (Plan B) 29 credit hours of course work in addition to 2 credit hours of Directed Research (Bioch or Bioph 799).

A final oral examination is required of all M.S. (Plan A) and Ph.D. candidates. The oral examination in defense of the candidate’s dissertation follows University regulations. All candidates for the doctoral degree are required to participate in the department’s teaching program.

Further details of the program may be obtained from the Prospectus for Graduate Training and Guide for Incoming Ph.D. or M.S. Candidates issued by the department and available from the departmental student adviser.
Intended candidates must have acquired adequate preparation in organic, physical and analytical chemistry, biology, mathematics and physics. They should consult initially with the departmental student adviser in planning their curricula and in choosing appropriate courses offered by other departments. Such courses can be taken within the departments of microbiology, physiology, pharmacology, genetics, zoology, chemistry, mathematics and physics. A student may participate in a large number of research programs offered by the members of the department. In particular fundamental research is presently being conducted within the areas of enzyme structure and function: the kinetics and catalytic function of metal enzymes: the mechanism of protein and hormone biosynthesis, in both normal and neoplastic systems: the application of clinical research to disease etiology: virus and nucleic acid synthesis and structure: the study of genetic mechanisms of growth: regulation at the cellular and tissue level: bioenergetics and membrane energy conservation systems: the application of biochemical, chemical, and physical techniques to the elucidation of enzyme and membrane structure and function as well as in the study of cancer tissue. Available courses at the graduate level are listed below.

**BIOCHEMISTRY (Bioch)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>480</td>
<td>Introduction to Human Endocrinology (2)</td>
</tr>
<tr>
<td>481</td>
<td>Introduction to Molecular Biology (2)</td>
</tr>
<tr>
<td>601-602</td>
<td>General Biochemistry (3-3)</td>
</tr>
<tr>
<td>605-606</td>
<td>Medical Biochemistry (2-2)</td>
</tr>
<tr>
<td>611-612</td>
<td>Medical Biochemistry Laboratory (1-1)</td>
</tr>
<tr>
<td>613</td>
<td>General Biochemistry Laboratory (2)</td>
</tr>
<tr>
<td>620</td>
<td>Advanced Topics in Clinical Biochemistry (2)</td>
</tr>
<tr>
<td>671</td>
<td>Seminar (1)</td>
</tr>
<tr>
<td>705</td>
<td>Special Topics in Biochemistry (2)</td>
</tr>
<tr>
<td>710</td>
<td>Special Topics in Enzymology (2)</td>
</tr>
<tr>
<td>720</td>
<td>Bioenergetics (2)</td>
</tr>
<tr>
<td>730</td>
<td>Nucleic Acids and Viruses (2)</td>
</tr>
<tr>
<td>740</td>
<td>Advanced Protein Chemistry (2)</td>
</tr>
<tr>
<td>799</td>
<td>Directed Research (v)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (v)</td>
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**BIOPHYSICS (Bioph)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<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>705</td>
<td>Special Topics in Biophysics (2)</td>
</tr>
<tr>
<td>706</td>
<td>Molecular Structure and Function of Cell Organelles (2)</td>
</tr>
<tr>
<td>799</td>
<td>Directed Research (v)</td>
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<tr>
<td>800</td>
<td>Thesis Research (v)</td>
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</table>

**Botanical Sciences**

**Graduate Faculty**

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Research Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. K. Akamine</td>
<td>post harvest physiology, tropical fruits</td>
</tr>
<tr>
<td>M. Aragaki</td>
<td>fungus physiology, disease control</td>
</tr>
<tr>
<td>R. R. Bergquist</td>
<td>fungal genetics, disease resistance</td>
</tr>
<tr>
<td>J. E. Bowen</td>
<td>biochemical and biophysical aspects of plant nutrition</td>
</tr>
<tr>
<td>I. W. Buddenhagen</td>
<td>phytobacteriology, ultrastructure</td>
</tr>
<tr>
<td>H. F. Clements</td>
<td>environmental physiology, crop-logging</td>
</tr>
<tr>
<td>B. J. Cool</td>
<td>mineral nutrition, salt uptake, tree nutrition</td>
</tr>
<tr>
<td>M. S. Doty</td>
<td>marine ecology, productivity, algal systematics</td>
</tr>
<tr>
<td>D. J. C. Friend</td>
<td>quantitative growth, environmental physiology</td>
</tr>
<tr>
<td>O. V. Holtzmann</td>
<td>nematology, general pathology</td>
</tr>
<tr>
<td>M. Ishii</td>
<td>virology</td>
</tr>
<tr>
<td>N. P. Kefford</td>
<td>hormonal regulation of development</td>
</tr>
<tr>
<td>W. Ko</td>
<td>soil microbiology</td>
</tr>
<tr>
<td>C. H. Lamoureux</td>
<td>comparative and developmental morphology, conservation</td>
</tr>
<tr>
<td>D. Mueller-Dombois</td>
<td>tropical and pioneer ecology</td>
</tr>
<tr>
<td>S. Nakata</td>
<td>developmental physiology of tree crops</td>
</tr>
<tr>
<td>S. S. Patil</td>
<td>host parasite physiology, post-harvest pathology, fungus physiology</td>
</tr>
<tr>
<td>E. W. Putman</td>
<td>carbohydrate biochemistry, soil chemistry</td>
</tr>
<tr>
<td>Y. Sagawa</td>
<td>cytology, cytogenetics, orchid genetics</td>
</tr>
<tr>
<td>S. M. Siegel</td>
<td>exobiology, stress physiology and biochemistry</td>
</tr>
<tr>
<td>C. W. Smith</td>
<td>morphogenetic processes, environmental effects</td>
</tr>
<tr>
<td>W. L. Theobald</td>
<td>systematics of angiosperms</td>
</tr>
<tr>
<td>E. E. Trujillo</td>
<td>soil-borne diseases</td>
</tr>
</tbody>
</table>

**Affiliate Faculty**

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Research Interests</th>
</tr>
</thead>
<tbody>
<tr>
<td>W. J. Apt</td>
<td>nematology, pineapple diseases</td>
</tr>
<tr>
<td>R. S. Byther</td>
<td>soil-borne diseases</td>
</tr>
<tr>
<td>F. R. Fosberg</td>
<td>tropical ecology and systematics</td>
</tr>
<tr>
<td>B. Krauss</td>
<td>anatomy, ethnobotany</td>
</tr>
<tr>
<td>L. G. Nickell</td>
<td>physiology of sugar cane, tissue culture</td>
</tr>
<tr>
<td>K. G. Rohrbach</td>
<td>pineapple disease</td>
</tr>
<tr>
<td>P. van Royen</td>
<td>systematics of tropical species</td>
</tr>
<tr>
<td>G. W. Steiner</td>
<td>host parasite physiology</td>
</tr>
<tr>
<td>W. H. Wagner</td>
<td>systematics, ferns</td>
</tr>
</tbody>
</table>

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

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

Plan A (thesis) and Plan B (nonthesis) are separate M.S. programs with distinct purposes. Before admission to candidacy, the plan a candidate intends to follow must be declared and approved. Plan A is the usual program to be taken by candidates. Plan B is offered at the discretion of the graduate faculty for students who do not intend to make research in botanical sciences their profession. Plan B programs emphasize the technological aspects of the botanical sciences. For the M.S. degree—Plan A, 12 credits shall be for thesis and a minimum of an additional 18 credits for courses approved by a candidate's committee are required. For the M.S. degree—Plan B, of the minimum of 30 credits required. 15 credits shall be earned in the major field, or an approved related field, in courses numbered 600-799. Of these credits, 6 must be for directed research in aspects of botanical sciences chosen by the candidate in consultation with his committee.

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

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

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

Available courses are listed below.

### BOTANICAL SCIENCES

**Botany (Bot)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>410</td>
<td>Plant Anatomy (3)</td>
</tr>
<tr>
<td>412</td>
<td>Microtechnique (3)</td>
</tr>
<tr>
<td>421</td>
<td>Developmental Biology (3)</td>
</tr>
<tr>
<td>430</td>
<td>Mycology (3)</td>
</tr>
<tr>
<td>436</td>
<td>Medical Mycology (3)</td>
</tr>
<tr>
<td>450</td>
<td>Natural History of the Hawaiian Islands (2)</td>
</tr>
<tr>
<td>453</td>
<td>Physiological Ecology (4)</td>
</tr>
<tr>
<td>454</td>
<td>Vegetation Ecology (4)</td>
</tr>
<tr>
<td>461</td>
<td>Systematics of Vascular Plants (4)</td>
</tr>
<tr>
<td>470</td>
<td>Principles of Plant Physiology (4)</td>
</tr>
<tr>
<td>480</td>
<td>Phycology (3)</td>
</tr>
<tr>
<td>610</td>
<td>Botanical Seminar (1)</td>
</tr>
<tr>
<td>612</td>
<td>Advanced Botanical Problems (v)</td>
</tr>
<tr>
<td>615</td>
<td>Morphology Seminar (2)</td>
</tr>
<tr>
<td>618</td>
<td>Cytology (3)</td>
</tr>
<tr>
<td>619</td>
<td>Seminar in Biology Teaching (1)</td>
</tr>
<tr>
<td>620</td>
<td>Origin, Evolution and Distribution of Flowering Plants (4)</td>
</tr>
<tr>
<td>631</td>
<td>Marine Phytoplankton (3)</td>
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<td>637</td>
<td>Physiology of Fungi (4)</td>
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<tr>
<td>640</td>
<td>Environmental and Space Biology II (v)</td>
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<tr>
<td>650</td>
<td>Ecology Seminar (1)</td>
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<td>651</td>
<td>Dynamics of Marine Productivity (3)</td>
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<td>662</td>
<td>Advanced Taxonomy (4)</td>
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<td>665</td>
<td>Nomenclature Seminar (2)</td>
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<td>670</td>
<td>Plant Nutrition and Water Relations (3)</td>
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<td>671</td>
<td>Energetics and Biosynthesis in the Plant Kingdom (3)</td>
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<td>672</td>
<td>Techniques in Physiology (2)</td>
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<tr>
<td>673</td>
<td>Techniques in Physiology-Biochemistry (2)</td>
</tr>
<tr>
<td>675</td>
<td>Physiology Seminar (1)</td>
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<tr>
<td>681</td>
<td>Phycology-Chlorophyta (2)</td>
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<tr>
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<td>683</td>
<td>Phycology-Myxophyta and Phaeophyta (2)</td>
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<td>684</td>
<td>Phycology-Rhodophyta (2)</td>
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<td>699</td>
<td>Directed Research (v)</td>
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<td>799</td>
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**Plant Pathology (PPath)**

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>411</td>
<td>Principles of Plant Pathology (4)</td>
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<tr>
<td>420</td>
<td>Biology and Ecology of Soil-Borne Plant Pathogens (3)</td>
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<tr>
<td>601</td>
<td>Tropical Plant Pathology (3)</td>
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<td>605</td>
<td>Clinical Plant Pathology (2)</td>
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<td>612</td>
<td>Principles of Plant Disease Control (3)</td>
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<td>616</td>
<td>Plant Nematology (3)</td>
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<td>621</td>
<td>Plant Pathology Techniques (3)</td>
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<td>625</td>
<td>Advanced Plant Pathology (2)</td>
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<tr>
<td>630</td>
<td>Plant Virology (3)</td>
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### BUSINESS ADMINISTRATION

**Graduate Faculty**

**Botany (Bot)**

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<tbody>
<tr>
<td>430</td>
<td>Mycology (3)</td>
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<td>436</td>
<td>Medical Mycology (3)</td>
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<tr>
<td>450</td>
<td>Natural History of the Hawaiian Islands (2)</td>
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<tr>
<td>453</td>
<td>Physiological Ecology (4)</td>
</tr>
<tr>
<td>454</td>
<td>Vegetation Ecology (4)</td>
</tr>
<tr>
<td>461</td>
<td>Systematics of Vascular Plants (4)</td>
</tr>
<tr>
<td>470</td>
<td>Principles of Plant Physiology (4)</td>
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<td>480</td>
<td>Phycology (3)</td>
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<tr>
<td>610</td>
<td>Botanical Seminar (1)</td>
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<td>612</td>
<td>Advanced Botanical Problems (v)</td>
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<td>615</td>
<td>Morphology Seminar (2)</td>
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<td>618</td>
<td>Cytology (3)</td>
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<tr>
<td>619</td>
<td>Seminar in Biology Teaching (1)</td>
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**Business Administration**

**Graduate Faculty**

H. D. Lowe, D.B.A. (Chairman)—accounting, finance
J. Adler, Ph.D.—accounting, finance
J. K. Bailey, Ph.D.—management
R. E. Baird, Ph.D.—management, travel industry management
E. M. Barnet, Ph.D.—management, marketing, travel industry management
H. D. Bess, Ph.D.—transportation
D. Bonbright, J.D.—business law
R. B. Bucchele, Ph.D.—management
N. H. P. Chung, Ph.D.—quantitative methods
C. F. Congdon, M.B.A.—statistics
D. A. Corbin, Ph.D.—accounting, finance
M. Cotlar, Ph.D.—management
L. J. Crampon, M.B.A.—travel industry management
E. M. Currie, Ph.D.—accounting
S. Dawson, Ph.D.—finance
D. S. Ellis, Ph.D.—management
E. W. J. Faison, Ph.D.—marketing
J. B. Ferguson, Ph.D.—personnel management, industrial relations
L. P. Freitas, Ph.D.—finance
C. Gee, M.A.—travel industry management
M. D. Geurts, Ph.D.—marketing
T. Q. Gilson, Ph.D.—management, industrial relations
H. Grayson, Ph.D.—business economics
R. C. Hook, Ph.D.—marketing
M. E. Hopkins, Ph.D.—personnel management, industrial relations
T. Ige, Ph.D.—business economics
L. W. Jacobs, Ph.D.—marketing
L. E. Jacobsen, Ph.D.—accounting, finance
E. Johnston, Ph.D.—travel industry management
L. Kelley, Ph.D.—management
R. Kessner, Ed.D.—management
S. Kim, Ph.D.—business economics and quantitative methods
H. E. Kramer, Ph.D.—marketing
E. E. Laitila, Ph.D.—real estate
S. S. O. Lee, Ph.D.—accounting
K. H. Lie, Ph.D.—business economics and quantitative methods
C. J. Metelka, Ph.D.—travel industry management
J. V. Miccio, Ed.D.—management
C. M. E. Hopkins, Ph.D.—personnel management, industrial relations
H. E. Hook, Ph.D.—management
L. E. Jacobsen, Ph.D.—accounting
E. M. Currie, Ph.D.—accounting
J. R. Omps, Ph.D.—management
E. C. Pendleton, Ph.D.—labor economics, industrial relations
H. C. Reeser, Ph.D.—management
E. Richman, D.Eng.Sci.—management
K. K. Seo, Ph.D.—business economics, money and banking
C. H. Spencer, D.B.A.—accounting
R. H. Sprague, D.B.A.—computer and systems analysis
H. B. Stellmacher, M.B.A.—marketing
R. A. Taussig, Ph.D.—accounting
A. M. Whitehill, Ph.D.—international management

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

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

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

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

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

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

Program Requirements—MBA Plan A

Group I, Foundation Courses—required only of students not possessing an undergraduate background in business administration.

Do not count towards the 33 required credit hours up to 15 hours

Group II, Advanced Disciplines & Functions 18 hours

Group III, Electives 9 hours

Group IV, Thesis 6 hours

33 hours

Program Requirements—MBA Plan B

Group I, Foundation Courses—required only of students not possessing an undergraduate background in business administration.

Do not count towards the 33 required credit hours up to 15 hours

Group II, Advanced Disciplines & Functions 21 hours

Group III, Electives 9 hours

Group IV, Integrative 3 hours

33 hours

Students desiring advanced work beyond the M.B.A. degree are advised to enroll in the Ph.D. program offered by the economics department. One of the graduate fields in this program and the research may be in business administration.

BUSINESS ADMINISTRATION

Group I

(Bus)

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

Group II

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

Group III

Accounting (Acc)
437 Advanced Tax Problems (3)
445 Advanced Cost Accounting (3)
703 Advanced Auditing (3)
704 Computers and Accounting In Business Systems (3)
705 Advanced Accounting Problems (3)
706 Accounting History and Theory (3)
707 Accounting for Management Planning and Control (3)
708 Seminar in Advanced Accounting (3)

Business Analysis & Quantitative Methods (BAS)
451 Non-Parametric Methods for Business Research (3)
455 Applied Regression Analysis (3)
713 Statistical Decision Theory (3)
714 Operations Research (3)
715 Quantitative Methods of Business and Economic Forecasting (3)

Business Economics (BEC)
723 Operations Economics (3)
724 Current Economic Problems (3)
*725 Capital Markets and International Finance (3)

Entrepreneurship (Ent)
610 Nature of Entrepreneurship (3)
630 Economics of Entrepreneurship (3)
640 Public Policy and Management Problems of New Enterprises (3)

Finance (Fin)
733 Problems in Business Finance (3)
734 Investment Analysis and Management (3)
735 The Financial System (3)

Law (Law)
786 Environment of Business (3)

Management (Mgt)
743 Selected Topics in Organization Theory and Practice (3)
*744 Comparative Management (3)
746 Production and Operations Management (3)

Courses 721, 725, 744, and 753 comprise International Business Course group.
Marketing (Mkt)
*753 International Marketing Management (3)
754 Marketing Communication and Promotional Strategy (3)
755 Marketing Research Methodology (3)

Personnel and Industrial Relations (PIR)
763 Personnel Administration (3)
764 Advanced Personnel Administration (3)
765 Labor Relations (3)
766 Problems of Collective Bargaining (3)

Real Estate (RE)
441 Land Economics
773 Real Estate (3)
774 Land Resource Development (3)

Management Information System (BAS)
783 Data Management Systems (3)
784 Management Information Systems (3)
785 Systems Analysis-A Computer Approach to Decision Models (3)
786 Computer Simulation-Business and Economics (3)

Transportation (Trans)
453 Air Travel Management (3)

Travel Industry Management (TIM)
771 Lodging Industry Administration (3)
775 International Travel and Transportation (3)
776 Socio-Political Factors in Tourism (3)

Research (Bus)
799 Directed Research (3)

Group IV

(Bus)
796 Business Policy (3)
800 Thesis (6)

Chemistry

Graduate Faculty
R. L. Pecskö, Ph.D. (Chairman)—chromatography, preparation and analysis of ultrapure materials
G. Andermann, Ph.D.—analytical spectroscopy, chemical physics, molecular x-ray photon spectroscopy, infrared optical properties of solids
T. T. Bopp, Ph.D.—physical chemistry, nuclear magnetic resonance
R. E. Cramer, Ph.D.—inorganic chemistry, structure and bonding of metal complexes, conformations of chelate rings, NMR of paramagnetic substances, semi-empirical molecular orbital calculations
C. S. Fadley, Ph.D.—physical and analytical chemistry; x-ray photoelectron spectroscopy
J. W. Gilje, Ph.D.—inorganic chemistry, boron hydride chemistry, phosphorus and nitrogen chemistry
A. T. Hubbard, Ph.D.—electroanalytical chemistry, surface quantum chemistry, electron spectroscopy, platinum complexes
J. L. Ihrig, Ph.D.—electrolyte solutions, transport properties, reaction mechanisms, kinetics, magnetoochemistry
R. G. Inskip, Ph.D.—infrared spectroscopy, hydrogen bonding, complex ions
E. F. Kiefer, Ph.D.—organic and bio-organic chemistry
H. O. Larson, Ph.D.—natural products, new synthetic methods, rearrangements
R. S. H. Liu, Ph.D.—organic chemistry, photochemistry
J. A. Mann, Ph.D.—physical chemistry, theoretical chemistry, physics and chemistry of surfaces, biomembrane physics
R. L. McDonald, Ph.D.—physical chemistry, ionic behavior in nonaqueous media, spectroscopic studies of weak interactions
R. E. Moore, Ph.D.—organic chemistry, structure determination and biosynthesis of natural products from marine organisms
D. W. Muenow, Ph.D.—high temperature mass spectrometry, volatile components of materials of geochemical interest
J. J. Naughton, Ph.D.—analytical, physical, solid state and geochemistry
L. L. Schaleger, Ph.D.—physical organic chemistry, kinetics and mechanism, hydrolysis and hydration phenomena
P. J. Scheuer, Ph.D.—organic chemistry, structure determination of natural products
K. Seff, Ph.D.—physical chemistry, structure determination by X-ray crystallography
J. L. T. Waugh, Ph.D.—boron chemistry, intermetallic and heteropoly compounds, X-ray studies
H. Zeitlin, Ph.D.—oceanographic chemistry

Graduate study in chemistry has three aspects: course work, independent study, and research. A thesis based on original research is the most important part of the master’s or doctor’s degree. Comprehensive examinations taken by Ph.D. candidates encourage a student to read the original literature in his field of interest.

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

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

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

Chemistry (Chem)
445 Intermediate Organic Chemistry (3)
601 Theory of Chemical Bonding (3)
602 Chemical Applications of Spectroscopy (3)
603 Structure and Reaction Mechanism (3)
622 Advanced Inorganic Chemistry I (3)
623 Advanced Inorganic Chemistry II (3)
631 Theory of Analytical Instrumentation (3)
632 Electroanalytical Chemistry (3)
633 Molecular Spectroscopy (3)
641 Organic Structure Determination (3)
642 Organic Synthesis (3)
651 Intermediate Physical Chemistry (3)
653 Introductory Quantum Chemistry (3)
655 Radiochemistry and Nuclear Reactions (3)
656 Radiochemical Techniques (1)
658 Crystallography (3)
*691-692 Seminar (1-1)
721 Special Topics in Inorganic Chemistry (v)
731 Special Topics in Analytical Chemistry (v)
741 Special Topics in Organic Chemistry (v)
751 Special Topics in Physical Chemistry (v)
753 Quantum Chemistry (3)
756 Statistical Mechanics (3)
761 Special Topics in Environmental Chemistry (v)
799 Directed Research (v)
*800 Thesis Research (v)
Civil Engineering

Graduate Faculty

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

Affiliate Faculty

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

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

CIVIL ENGINEERING (CE)

623 Hydraulic Transients (3)
624 Flow in Porous Media (3)
626 Surface-Water Hydrology (3)
627 Ground-Water Hydrology (3)
628 Water Resources Planning and Development (3)
629 Water Resources System Analysis (3)
631 Water Quality Management (3)
632 Advanced Water Treatment Technology (3)
634 Waste Water Treatment Plant Design (3)
635 Sanitary Engineering Chemistry (4)
636 Sanitary Engineering Microbiology (4)
637 Environmental and Sanitary Engineering Lab (3)
638 Environmental and Sanitary Engineering Public Health (3)
640 Industrial Waste Treatment (3)
641 Marine Disposal of Wastes (3)
645 Development Planning I (3)
646 Development Planning II (3)
664 Analysis and Design of Urban Transportation Systems (3)
665 Simulation and Modeling of Urban Systems (3)
671 Theory of Elasticity I (3)
673 Theory of Plasticity (3)
675 Theory of Vibrations (3)
676 Structural Dynamics (3)
677 Energy Methods in Applied Mechanics (3)
678 Theory of Plates (3)
679 Theory of Thin Shells (3)
681 Advanced Indeterminate Structures (3)
682 Numerical Methods of Structural Analysis (3)
683 Advanced Reinforced Concrete Design I (3)
686 Numerical Methods in Continuum Mechanics (3)
687 Design of Structural Systems (3)
691 Seminar in Civil Engineering I (1)
692 Seminar in Civil Engineering II (1)
696 Selected Topics in Civil Engineering (3)
699 Directed Reading or Research (v)
800 Thesis Research (v)

Classics

Graduate Faculty

A. Burns, Ph.D. (Chairman)—Roman republic, Greek philosophy
R. Ball, Ph.D.—Roman and Greek poetry
R. Littman, Ph.D.—Greek literature and historians

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

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

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

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

LATIN (Latin)

401 Historians (3)
409 Lyric Poets (3)
420 Vergil (3)
427 Satire (3)
428 Drama (3)
433 Roman Philosophy (3)
434 Lucretius (3)
440 Oratory (3)
490 Seminar (3)
601 Advanced Latin Composition (3)
610 Literature of the Republic (3)
611 Augustan Literature (3)
612 Literature of the Empire (3)
651 Seminar in Roman Literature (3)
699 Directed Research (v)
GREEK (Greek)
409 Plato (3)
410 Historians (3)
421 Homer (3)
422 Lyric Poetry (3)
431 Introduction to Drama (3)
432 Drama (3)
441 Pre-Socratics (3)
442 Aristotle (3)
490 Seminar (3)
651 Seminar in Greek Literature (3)
699 Directed Research (v)

CLASSES
800 Thesis Research (6)
EUROPEAN LANGUAGES (EL)
630 Seminar in Research Methods (1)

Drama and Theatre

Graduate Faculty
B. Dukore, Ph.D. (Chairman)—theory, criticism, directing
J. Brandon, Ph.D.—Oriental theatre
G. Cannon, A.B.—acting, directing
D. Carroll, Ph.D.—playwriting, theory
T. Knapp—acting, directing
E. Langhans, Ph.D.—theatre history
R. Mason, M.F.A.—design
T. Miller, M.A.—children’s theatre, puppetry, creative drama
J. Trapido, Ph.D.—stagecraft and lighting, theatre planning
C. Wolz, M.A.—dance

M.A. and M.F.A.

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

Intended candidates must present an adequate undergraduate background in the humanities, submit three letters of recommendation, and submit official scores for the Graduate Record Examination aptitude tests. Upon the successful completion of 12 credits of graduate courses within this department, the elimination of any academic deficiencies, and (for M.F.A. candidates) the demonstration of an acceptable example of creative work, they may be admitted to candidacy. East-West Center grantees from the United States must meet the East-West Center requirements for an Asian or Pacific language.

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

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

Ph.D.

The doctor of philosophy degree, given for scholarship in theatre history, criticism, or theory, not creative or artistic work, is offered in three areas: (1) Western Theatre. Required courses are 610 and two other seminars. A minor of at least 12 graduate credit hours is required in anthropology, art, English, history, music, or philosophy. (2) Oriental Theatre. Required courses are 610, 664, and one other seminar. A minor of at least 12 graduate credit hours is required in Far Eastern history, art history, or philosophy; or in Oriental drama and literature. (3) Comparative Oriental-Western Theatre. The curriculum is determined by the graduate faculty.

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

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

Admission to candidacy requires a broad background in the humanities, a master’s degree in theatre or its equivalent, and competence in dramatic production. A high level of accomplishment in a foreign language appropriate to the proposed area of research is required; for candidates in Oriental theatre and comparative Oriental-Western theatre the language must be Asian.

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

Graduate Faculty

B. Campbell, Ph.D. (Chairman)—macroeconomic theory, monetary theory
L. Chau, Ph.D.—econometrics, mathematical economics (on leave)
S. Comitini, Ph.D.—marine resource economics, international economics
R. Ebel, Ph.D.—public finance, macroeconomics
M. Ghali, Ph.D.—econometrics, economic planning
W. Gorter, Ph.D.—international economics
R. Heller, Ph.D.—international economics, monetary theory
F. Hung, Ph.D.—microeconomics, economic development
R. Kamins, Ph.D.—public finance
Y. Lim, Ph.D.—economic development, monetary theory
J. Mak, Ph.D.—economic development, economic history
W. Miklius, Ph.D.—industrial organization, regional economics
L. Miller, Ph.D.—monetary theory, microeconomics
J. Moncur, Ph.D.—mathematical economics, water resources
S. Naya, Ph.D.—international economics, economic development (on leave)
H. Oshima, Ph.D.—economic development, income accounting (on leave)
R. Pollock, Ph.D.—public finance, macroeconomics
J. Power, Ph.D.—economic development, economic theory
B. Renaud, Ph.D.—urban and regional economics
D. Suits, Ph.D.—economic theory, econometrics (visiting)
Y. Yeh, Ph.D.—international economics

The department offers programs leading to the M.A. and Ph.D. in economics. These programs are designed to prepare students for careers as research economists in government and business and for careers in the academic profession. All students are expected to acquire a strong background in economic theory. In addition, specialization is possible in the following fields: economic development, international economics, urban and regional economics, public finance, monetary economics, econometrics, economic demography, human resource economics, and marine resource economics.

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

Departmental Requirements

Entering graduate students are expected to have completed courses in intermediate micro- and macro-economic theory, money and banking, elementary statistics and mathematics through calculus.

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

M.A.

The department offers Plan A, Plan B, and Plan C programs leading to the M.A. degree. Students must be in residence for at least two semesters and complete all degree requirements within a five year period.

Courses. M.A. candidates in Plan A and B must have a minimum of 30 credits. Students must earn at least 18 credits with an average of B in graduate economics courses at the University of Hawaii. All Plan A and B students must pass Econ 600 and 601 with at least B, take one seminar course, and pass Econ 425 with a grade of C or better (or petition to have equivalents accepted). There are no course requirements for Plan C.

Ph.D.

Ph.D. students must be in residence for at least three semesters and complete all requirements within six years. Courses 600 and 601 must be passed with B or better, 425 and 426 must be passed with C or better (or equivalents accepted by petition).

Qualifying Examination. Ph.D. students must complete the qualifying examination in basic economic theory (covering both micro and macro economics at the 600-601 level) or receive A's in both Econ 600 and 601. In addition, students must take one field exam. Field exams are generally offered in advanced economic theory, monetary economics, public finance, international economics, economic development, urban and regional economics, econometrics, economic demography, human resource economics, and marine resource economics. Students may receive a maximum of one "conditional pass" in their written exams. Students who must retake any exam, are required to retake all exams in which they did not receive a "high pass" or "pass" grade. Plan C students must take an initial oral exam, pass all examinations required of Plan B students, and in addition submit one research paper and pass a final oral examination.

Final Examination. Students will defend their dissertation in a final oral exam which is open to the public.

ECONOMICS (Econ)

.04 History of Economic Thought (3)
.05 Comparative Economic Systems (3)
.10 Economic Development (3)
.11 Economic Development of Europe (3)
.12 Economic Development of U.S. (3)
.15 Asian Economic Development (3)
.20 Mathematical Economics (3)
.24 Introduction to the Theory of Statistics (3)
.25 Econometrics I (3)
.26 Econometrics II (3)
.30 Economics of Human Resources (3)
.40 Monetary Theory and Policy (3)
Educational Administration

Graduate Faculty

R. R. Dunwell, Ed.D. (Chairman)—foundations of educational administration; administrative theory
C. T. Araki, Ed.D.—human factors in organization; school-community relations; program evaluation
H. V. Everly, Ph.D.—general school administration
J. A. Thompson, Ph.D.—school law, school finance, collective negotiations
S. S. Varney, Ed.D.—systems planning, systems management

Admission

Admission to study is open to any student admitted to graduate studies at the University of Hawaii. Department course offerings include upper-division and graduate courses for majors and non-majors.

Students who seek the M.Ed. degree in educational administration must (1) present a minimum of 9 semester hours of undergraduate or graduate course work in professional education, or (2) appropriate job-related experience to evidence familiarity with teaching or educational organization. For students entering from fields other than education, this requirement may be met through course work in addition to other degree requirements.

Admission to candidacy for the degree is based on (1) written evidence of two years of full-time teaching or equivalent professional experience, (2) the quality of the student’s academic record, and (3) successful completion of a minimum of 9 semester hours of department course work, including Ed EA 601 and Ed EA 602.

Programs

The basic program of the department is designed to prepare educational administrators and supervisors for a broad range of school-related administrative positions. Students are encouraged to plan an individualized program of electives to prepare them for specific educational positions. These include: elementary and secondary principals and vice-principals, community college administrators, student personnel administrators, department and grade-level chairpersons, district and state staff specialists, higher education staff positions.

Field Experience

Candidates are encouraged to include a planned field experience in their degree programs. Supervised administrative internships can be arranged for individuals in public and private schools and in other positions related to educational administration.

Degree Requirements

Plan A requires a minimum of 30 semester hours, 6 of which are earned through the master’s thesis. Program requirements include: (1) EA 601, (2) EA 602, (3) one course in human factors, (4) one course in program planning and management, (5) one course in legal/financial aspects, (6) one seminar in the principalship, and (7) one course from each of two of the following fields: educational foundations, educational psychology, and curriculum and instruction.

Plan B, the nonthesis plan, requires a minimum of 36 semester hours. Program requirements include: (1) EA 601, (2) EA 602, (3) one course in human factors, (4) one course in program planning and management, (5) one course in legal/financial aspects, (6) one seminar in the principalship, (7) one course in educational foundations, (8) one course in educational psychology, (9) one course in curriculum and instruction, and (10) a directed research project with the major adviser.

Selection of specific courses in the above areas will be by the candidate with the advice and approval of his major adviser.

The department will accept a maximum of 9 semester hours of transfer credit when such work is appropriate to degree requirements.
Educational Communications

Graduate Faculty

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

Educational communications, which embraces the sub-areas of media communication skills, instructional technology and instructional development, is a field of study which concentrates on the application of new technological advancements to the general areas of education. Educational communications (Ed EC) approaches the whole process of teaching and learning through judicious use of various informational communications channels. Like all forms of applied technology, Ed EC assumes that theoretical knowledge and scientific principles can be applied to the problems that arise in a social context. Furthermore, it assumes that the process of application can be controlled and repeated at will. New methods of visual and oral communication are investigated and their use explored in the classrooms and other learning situations. The field of Ed EC has a total commitment to search systematically for new and effective ways of organizing the teaching and learning process.

Thus, educational communications as a field of study draws many of its major premises from the field of psychology and other behavioral sciences and operates within the general framework of curriculum development. Implicit in the work of those involved with Ed EC is the search for manpower deployment alternatives which aim to use modern instructional channels, materials and technology for better communication and for better learning in cognitive, psychomotor, as well as affective domains of learning. When successful, Ed EC applications will free the teacher or trainer to engage in full-time teaching, i.e., counseling, planning, and evaluating with learners their search for understanding and for ways of fulfilling their potential.

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

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

A baccalaureate degree from an accredited institution, in any field of study, is acceptable to the department of educational communications, provided the student's undergraduate scholastic record is acceptable to the Graduate Division. A "B" average (3.0 grade point ratio) is needed for regular status. No applicant with GPR of less than 2.7 will be considered for probation status.

Evidence of at least one year of successful teaching experience needs to be presented in support of a student's application. This experience can be either in K-12 grades, college level, or other instructional contexts. Thus, teaching experience in industrial, business or military training, correctional institutions, or similar programs may be accepted, provided the applicant presents a written statement which will explain fully such teaching experience.

In special cases, the department will entertain a student's petition to accept some other activity and/or experience as equivalent to teaching. Such a petition must also be in writing, and must outline the kinds of practical work which the student considers acceptable and acceptable in lieu of teaching.

The department requires that all students take the Graduate Record Examination (GRE). Consult the Graduate Bulletin of the Educational Testing Service (Princeton, N.J.) for institutions and dates. Both the aptitude test (verbal and quantitative) and the advanced test in education (Code 34) must be taken.

The master's degree program requires the completion of at least 30 semester credit hours, of which a minimum of 24 must be in educational communications plus 6 thesis credits (Plan A, thesis), or at least 36 semester credit hours (27 semester credit hours in educational communications) when the student pursues Plan B, nonthesis.

All entering students for a program in educational communications are required to take, as the very first course in educational communications, Ed EC 400 Media Technology. Basic working knowledge of the course content is a prerequisite of entry into the program. All students are required to enroll in the courses marked with the asterisk in their proper sequence.
EDUCATIONAL COMMUNICATIONS (Ed EC)

314 Audiovisual Techniques (3)
399 Directed Reading (v)
400 Media Technology (3)
*404 Survey of Educational Communications Media (3)
450 Media Utilization and Organization (3)
495B Media Practicum: Local Materials (1)
495C Media Practicum: Educational Still Photography (1)
495D Media Practicum: Basic ITV Skills (1)
495E Media Practicum: Microteaching (1)
495F Media Practicum: Audio Systems (1)
495G Media Practicum: Self Tutorial Systems (1)
495H Media Practicum: Curriculum Application (1)
*605 Seminar in Media Research (3)
*620 Production of Instructional Materials (3)
623 Survey & Production of Asian and Pacific Study Materials (3)
625 Educational Still Photography (3)
626 Educational Motion Pictures (3)
*630 Television in Education (3)
635 ETV Systems and Programs (3)
639 Mass Communication and Education (3)
640 Programmed Learning (3)
650 Media Service Administration (3)
670 Educational Communications Systems (3)
*690 Seminar and Internship in Media Leadership (3)
   (Plan B only)
699 Directed Reading and/or Research (v)
750 Seminar in Administration and Management of Media Programs (3)
*800 Thesis Research (3) (Plan A only)

EDUCATIONAL FOUNDATIONS

Educational Foundations

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

Affiliate Faculty
T. Brameld, Ph.D.—philosophy

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

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

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

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

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

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

EDUCATIONAL FOUNDATIONS (Ed EF)

409 Ethnicity, Poverty, and Education (3)
445 Educational Sociology (3)
480 Anthropology and Education (3)
*650 Historical Foundations of Western Education (3)
*651 History of American Education (3)
652 History of Education in Hawaii (3)
657 Community College (3)
*660 Philosophy of Education (3)
664 Seminar in Problems in Education (2)
665 Comparative Ideologies and Education (3)
669 Foundations of Comparative Education (3)
*670 Comparative Education: Europe and America (3)
*671 Comparative Education: Asia (3)
*683 Social Foundations of Education (3)
*684 Education and World Order (3)
685 Education in America (3) (for foreign students only)
686 Environmental Education (3)
699 Directed Reading and/or Research (v)
725 Education and Social Change (3)
751 Recent History of American Education (3)
757 Educational Utopias (2)
761 History of American Higher Education (3)
763B Seminar in Educational Issues (2)
763C Seminar on John Dewey (2)
763D Seminar in Contemporary Educational Philosophers (2)
763E Seminar in Japanese Educational Philosophy (2)
763F Seminar in History of Education (2)
767 Seminar in Special Problems in Educational Foundations (2)
770B Seminar in Comparative Education: Asia (2)
770C Seminar in Comparative Educ: Developing Nations (2)
770D Seminar in Comparative Educ: Industrial Nations (2)
770E Seminar in Comparative Educ: British Commonwealth (2)
800 Thesis Research (v)

*See department brochure on Plan B.
Educational Psychology

Graduate Faculty

T. Gust, Ph.D. (Chairman)—counseling psychology
D. C. Adkins, Ph.D.—statistics and measurement
J. A. Apffel, Ed.D.—special education
H. I. Ayabe, Ph.D.—cognition and measurement
F. T. Bail, Ph.D.—cognitive development, statistics
D. D. Blaine, Ph.D.—learning and quantitative methods
T. M. C. Chang, Ph.D.—education of culturally disadvantaged
D. R. Collins, Ed.D.—school counseling
P. Dunn-Rankin, Ed.D.—statistics, computer application
H. J. Dupont, Ph.D.—special education
G. Fargo, Ph.D.—special education
G. Y. Fujita, Ph.D.—statistics
D. W. Fullmer, Ph.D.—counseling, group and individual
D. A. Leton, Ph.D.—school psychology
D. K. McIntosh, Ed.D.—special education
J. Michel, Ph.D.—counseling
W. Nunokawa, Ph.D.—counseling, organization and management
J. M. O’Malley, Ph.D.—early childhood education
F. D. Payne, Ph.D.—statistics and measurement
I. E. Reid, Ph.D.—learning, measurement
T. A. Ryan, Ph.D.—learning, measurement
D. G. Ryans, Ph.D.—measurement
J. L. Shapiro, Ph.D.—counseling and psycho-therapy,
encounter groups
D. Sherrill, Ph.D.—research methods, socio-psychology
A. W. Staats, Ph.D.—learning, language development
D. Whitaker, Ph.D.—socio-psychology, higher education

Applicants for the M.Ed. and Ph.D. programs in educational psychology must present a minimum of 12 semester hours in psychology and educational psychology which includes courses in developmental psychology, tests and measurements, and psychological foundations of education.

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, as well as three letters of recommendation relating to academic and/or professional background, must be submitted. Advancement to candidacy is based on the quality of the student’s work in the first semester of study.

Areas of study offered: counseling and guidance, college student personnel, learning, measurement, and research methods. A program in special education is also administered by the department at this time. The curriculum in counseling and guidance meets certification requirements of the Hawaii State Department of Education.

Plan A requires a minimum of 24 credit hours in a planned and approved sequence of courses and 6 hours of thesis research.

Plan B requires a minimum of 30 hours in a planned and approved sequence of courses.

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 program in educational psychology offers individual programming to students interested in pursuing theoretical work in areas applicable to education. 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 the first semester’s work in the program, 2 satisfactory completion of departmental qualifying examinations, (3) demonstrating proficiency in computer use.

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.

EDUCATIONAL PSYCHOLOGY (Ed EP)

416 Tests and Measurements (3)
429 Introductory Statistics (3)
601 Guidance in the School (3)
602 Elementary School Guidance (3)
603 Introduction to Practicum (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)
686 Principles of Rehabilitation Counseling (3)
687 Psychological-Medical Aspects of Rehabilitation (3)
699 Directed Research (v)
701 Seminar in Guidance (3)

(1) School Psychology
(2) Testing
(3) Counseling
(4) Vocational
(5) Elementary School
(6) Administration
(7) Group Procedures
(8) Philosophical and Social Issues in Guidance
(9) Student Personnel Work in Higher Education (3)
(10) Rehabilitation (3)
702 Group Guidance (3)
703 Guidance Practicum (3)
708 Educational Research Methods (3)
709 Advanced Problems of Educational Measurement and
Evaluation (3)
710 Counseling: Group Theory and Practice (3)
729 Scaling Qualitative Data (3)
768 Seminar in Educational Psychology (3)

(1) General
(2) Learning
(3) Measurement
(4) Research and Statistics
(5) Psycho-Social Development
800 Thesis Research (v)

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

Graduate Faculty

N. Abramson, Ph.D.—information theory; coding theory
R. Chattopadhyay, Ph.D.—optimization
G. Fang, Ph.D.—acoustics; physical electronics
N. T. Gaarder, Ph.D.—communication theory; information theory
B. S. M. Granborg, Ph.D.—automatic control systems; computer applications
H. H. H. Hwang, Ph.D.—power system analysis; control systems
B. Kinariwala, Ph.D.—system theory; computing algorithms
F. Koide, Ph.D.—biomedical engineering
F. F. Kuo, Ph.D.—system theory; computer applications
W. W. Lichtenberger, Ph.D.—computer systems
S. Lin, Ph.D.—information theory; error-correcting codes
K. Najita, Ph.D.—electromagnetic theory
W. W. Peterson, Ph.D.—computers; error-correcting codes; information theory
T. H. Roelofs, Ph.D.—radio science; ionospheric physics
D. Slepian, Ph.D.—communication theory
D. R. Stoumery, Ph.D.—computer applications, numerical methods
P. F. Weaver, Ph.D.—radio science; ionospheric physics
E. J. Weldon, Jr., Ph.D.—error-correcting codes, computer applications
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 require 30 credits in approved technical courses numbered 400 or above of which at least 18 credits must be in electrical engineering. Furthermore, both plans also require 18 credits in courses numbered 600 or above, in addition to two graduate seminars in electrical engineering or a related field.

Plan A requires 9 credits in EE 800, Thesis Research, and a minimum of 12 credits in courses numbered 600-799 with a maximum of 2 credits in 699. Plan B requires 18 credits in courses numbered 600-799 with a maximum of 6 credits in 699. All students must be in residence here during the semester in which they receive their degree.

Ph.D.

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

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

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

After passing the qualifying examination, the student is advanced to candidacy and must have a thesis committee appointed within two semesters. The committee should consist of at least five members, one of whom must be in a department other than electrical engineering. After appointment of the committee, the student should work out a tentative program of courses which meets with the approval of his committee.
When the student has completed most of his course work but before he undertakes his research, he must pass a comprehensive examination. This consists of an oral examination given by his entire committee, and may be preceded at the discretion of individual committee members by an additional oral or written examination. If the student fails, he may repeat the examination only once, no sooner than three months after the first examination. When the student passes the comprehensive examination, he proceeds with his dissertation research.

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

**ELECTRICAL ENGINEERING (EE)**

- 411 State Space Analysis (3)
- 415 Digital Filter Design (3)
- 422 Electronic Instrumentation (3)
- 425 Instrumentation Laboratory (1)
- 424 Integrated Circuit Fabrication Techniques
- 425 Integrated Circuits (3)
- 427 Physical Electronics (3)
- 428 Nonlinear and Digital Electronics (3)
- 429 Nonlinear and Digital Electronics Laboratory (1)
- 435 Power System Analysis (3)
- 436 Direct Energy Conversion (3)
- 441 Communication Systems (3)
- 446 Information Theory and Coding (3)
- 451 Feedback Control Systems (3)
- 452 Feedback Control Systems Laboratory (1)
- 453 Modern Control Theory (3)
- 460 Switching Circuit Theory (3)
- 461 Digital Systems and Computer Design
- 462 Digital Techniques Laboratory (1)
- 463 Analog Computers (3)
- 466 Computer Organization and Programming Techniques (3)
- 467 Algorithmic Languages (3)
- 473 Microwave Communications (3)
- 474 Antennas (3)
- 475 Radio-Wave Propagation (3)
- 477 Fundamentals of Radar, Sonar and Navigation Systems (3)
- 481 Bioelectricity (3)
- 483 Biomedical Engineering (3)
- 486 Biomedical Electronics (3)
- 487 Biomedical Electronics Laboratory (1)
- 491-492 Special Topics in Electrical Engineering (3)
- 601 Graph Theory and its Applications (3)
- 603 Computer-Aided Analysis (3)
- 604 Computing Algorithms (3)
- 613 Linear System Analysis (3)
- 614 Analysis of Nonlinear Systems (3)
- 617 Computer-Aided Circuit Design (3)
- 618 System Optimization (3)
- 621 Advanced Physical Electronics (3)
- 623 Advanced Electronic Instrumentation (3)
- 625 Solid State Devices (3)
- 627 Advanced Topics in Physical Electronics (3)
- 628 Analysis and Design of Integrated Circuits (3)
- 646 Principles of Communications I (3)
- 647 Principles of Communications II (3)
- 648 Error-Correcting Codes (3)
- 649 Advanced Information Theory (3)
- 651 Non-linear Control Systems (3)
- 652 Optimal Control (3)
- 653 Stochastic Control (3)
- 655 Sampled-Data Control Systems (3)
- 657 Hybrid Automatic Control Systems (3)
- 660 Computer Organization (3)
- 661 Theory of Digital Machines (3)

**Elementary Education**

**Graduate Faculty**

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

The fundamental purpose of the master's program in elementary education is to promote the continued development of professional competency of each candidate in both general and special areas of elementary education so that he may effectively serve in whatever position he holds or hopes to secure.

More specifically, the program is aimed towards producing individuals who are (1) knowledgeable about the developmental and educational needs of children from various types of communities, (2) skillful in diagnostic and evaluation procedures and in developing educational programs to meet individual and group needs, (3) versatile in their employment of teaching strategies, (4) capable of providing leadership in a team situation in a classroom, school, or school system, (5) knowledgeable about issues, trends and research in their fields, and (6) objective in their assessment of trends and innovations.

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, and (2) 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, 3-6 in foundations of education, 9-18 in elementary education, and 9-18 in related fields. Additional hours may be required depending upon the student's background in interpreting research, in issues and problems related to the elementary school curriculum, and in academic areas related to the major field of concentration.
Required courses in elementary education are marked with an asterisk below.

CURRICULUM AND INSTRUCTION (Ed Cl)

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

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

English

Graduate Faculty

J. M. Backus, Ph.D. (Chairman)—American literature and language
G. L. Anderson, Ph.D.—18th-century literature, Asian and comparative literature
C. S. Bouslog, Ph.D.—English romanticism, 20th-century British and American literature
A. G. Day, Ph.D. (retired)—consultant in Pacific literature
L. Edel, Ph.D.—comparative literature, fictional theory, literary psychology, theory of biography, American literature
R. Foster, Ph.D.—American literature, criticism
A. Friedman, Ph.D.—20th-century literature
T. H. Fujimura, Ph.D.—17th- and 18th-century literature, drama
J. M. Gray, Ph.D.—literary theory
V. Hollingshead, Ph.D.—English novel, bibliography
W. E. Huntsberry, M.A.—writing
J. Kau, Ph.D.—Renaissance literature
B. Kirtley, Ph.D.—Pacific literature, folklore
R. L. Larson, Ph.D.—rhetoric and composition, Restoration literature
A. P. Leib, Ph.D.—American literature, medieval literature, Pacific literature
A. J. Levy, Ph.D.—American literature
J. Malby, Ph.D.—modern drama, 18th-century literature
E. McCutcheon, Ph.D.—Renaissance and 17th-century literature
B. Menikoff, Ph.D.—American literature
T. Pak, Ph.D.—language and linguistics
H. I. Shapiro, Ph.D.—Victorian literature
Y. Shen, Ed.D.—English language
M. C. Solomon, Ph.D.—20th-century literature
D. Stempel, Ph.D.—19th-century literature, linguistics, criticism
B. M. Stilians, 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. E. Winters, Ph.D.—comparative literature, Chinese and American literature

Intended candidates for the M.A. in English are expected to have acquired 27 semester hours of undergraduate credit in English or closely related subjects; before the award of the M.A., students whose first language is English are expected to demonstrate a reading knowledge of a foreign language, ancient or modern. Courses for the M.A. are selected mainly from the following list, although advanced courses in other disciplines may be substituted. Required courses are: English 401 or 402 (or equivalent); English 630; and one 700-level seminar in literature offered by the English department. The following courses may be repeated for credit since content usually differs from semester to semester: English 469, 479, 489, 660, 675, 735, 745, 775, 780, 785.

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

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

At present, the department does not offer a Ph.D.
English as a Second Language

Graduate Faculty
R. Crymes, Ph.D. (Chairman)—practicum and English language
E. Afendras, Ph.D.—language acquisition
V. Bickley, Ph.D.—practicum and language acquisition
C. Blatchford, Ph.D.—practicum and English language
M. Higa, Ed.D.—language acquisition
K. Jackson, Ed.D.—practicum
R. Jacobs, Ph.D.—English language
R. Krohn, Ph.D.—practicum and English language
M. Lester, Ph.D.—English language
C. Mason, Ph.D.—practicum
T. Pfaister, M.A.—practicum
T. Rodgers, Ph.D.—language acquisition
D. Steinberg, Ph.D.—language acquisition

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

Curriculum: The program is divided into three areas: practicum, English language and linguistics, and language acquisition. The first area, the practicum, deals with methods and materials of teaching English as a second language. Included in this area are all courses of an applied or pedagogical nature. The second area, English language and linguistics, deals with the phonology and grammar of modern English through current linguistic theory. The third area, language acquisition, deals with the psychological and social factors that are relevant to an understanding of how a second language is learned. The emphasis placed on theory and research in language acquisition is a distinctive characteristic of this program.

Undergraduate Preparation for Plans A and B: Since there is no undergraduate program in teaching English as a second language in most schools, American students come into the program from a wide variety of backgrounds. Students whose native language is not English are expected to have majored in English (language and/or literature). American students who have had no literature courses are admitted with an undergraduate deficiency and must take 6 units of work in literature in addition to the required 30 units.

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

Language Requirements: Non-native speakers of English (foreign students) are expected to have a score of 550 or higher on the Test of English as a Foreign Language (TOEFL).

All students, both American and foreign, are required to take (on a credit basis) the first semester of a language that they have not taken before. This language course must be taken while the student is enrolled in the M.A. in ESL program and is in addition to the 30-units required for Plans A and B.

Advancement to Candidacy: There is no general examination required. A student is advanced to candidacy upon recommendation of the graduate faculty at the end of that semester, normally his first, in which he has completed a minimum of 6 credit hours in ESL courses, has a minimum grade of B in all ESL courses taken, and has an overall cumulative GPR of 3.0. Comprehensive and final examination requirements vary according to the program plan selected (see below).

Plan A
Plan A is a 30-credit program of which 6 credit hours are allotted to thesis research and 24 credit hours to course work. In his course work the student must complete the program requirements for one of the three programs outlined under Plan B: (1) the general program; (2) the specialization in English language; or (3) the specialization in language acquisition. See Plan B below. Plan A requires two one-hour
oral exams, the first at the time that the thesis proposal is presented and the second at the time the thesis is completed.

Plan B

Students following Plan B may elect the general course or an area of specialization in either English language or in language acquisition. (All courses carry 3 units of credit.)

General Course

Area I Practicum (9 units required)

Required
- ESL 604 Materials Selection and Adaptation
- ESL 610 Teaching English as a Second Language
- or
- ESL 611 Problems in TESL
- ESL 730 Seminar in ESL

Electives
- ESL 425 Linguistics and Reading
- ESL 455 Materials for Teaching English Grammar
- ESL 465 Materials for Teaching English Phonology
- ESL 720 Second Language Testing

Area II English Language and Linguistics (6 units required)

Required
- ESL 450 English Syntax
- ESL 460 English Phonology

Electives
- ESL 360 The English Language in Hawaii
- ESL 651 Advanced English Syntax

Area III Language Acquisition (6 units required)

Required
- ESL 650 Psycholinguistics
- ESL 660 Language, Culture, Society, and Language Education

Comprehensive Examination: Plan B requires a 3-hour written examination during the student’s last semester or in the semester in which he has completed 24 credits, including all required courses.

Specialization in English Language

Area I Practicum (3 units required)

Required
- ESL 610 Teaching English as a Second Language
  (This may be substituted for by another course in the practicum area, if the student has had teaching experience.)

Area II English Language and Linguistics (15 units required)

Required
- ESL 450 English Syntax
- ESL 460 English Phonology

Electives (Choose two courses)
- ESL 360 The English Language in Hawaii
- ESL 651 Advanced English Syntax
- Eng 401 Modern English Grammar
- Eng 402 History of the English Language
- Eng 403 American English
- Eng 404 English Phonology
- Ling 410 Articulatory Phonetics
- Ling 421 Introduction to Phonological Analysis
- Ling 422 Introduction to Grammatical Analysis
- Ling 611 Acoustic Phonetics
- Ling 615 The Nature of Language
- Ling 621 Phonology
- Ling 622 Grammar
- Ling 635 Language Variation

Area III Language Acquisition (3 units required)

Required
- ESL 650 Psycholinguistics

Electives (9 units required)
  Three courses related to the program are to be selected.

Specialization in Language Acquisition

Area I Practicum (3 units required)

Required
- ESL 610 Teaching English as a Second Language
  (This may be substituted for by another course in the practicum area, if the student has had teaching experience.)

Area II English Language and Linguistics (6 units required)

Required
- ESL 450 English Syntax
- ESL 460 English Phonology

Area III Language Acquisition (12 units required)

Required
- ESL 650 Psycholinguistics
- ESL 660 Language, Culture, Society, and Language Education
- ESL 750 Seminar in Developmental Psycholinguistics
- EdEP 429 Introductory Statistics

Electives (9 units required)
  Three courses related to the program are to be selected.

Plan C

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

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

Students enrolled under Plan C are exempted from the 30-credit requirement and from the specific course requirements of Plan B (but not from the residency requirement). The exact nature of the student’s program will be determined after his arrival. Students in Plan C must take a final oral examination in addition to the comprehensive examination described in Plan B—General Course.

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

Those students who are interested in doing advanced research in the area of applied linguistics and psycholinguistics are advised to refer to the Ph.D. concentration in psycholinguistics in the department of linguistics.
ENTOMOLOGY

Entomology

Graduate Faculty
W. C. Mitchell, Ph.D. (Chairman)—economic entomology
J. W. Beardsley, Jr., Ph.D.—biological control, systematics
H. A. Bess, Ph.D. (Professor Emeritus)—biological control and ecology
W. Carter, Ph.D. (Professor Emeritus)—insect transmission of plant pathogens
F. Chang, Ph.D.—insect physiology
F. H. Haramoto, Ph.D.—acarology
D. E. Hardy, Ph.D.—taxonomy, medical entomology
A. A. LaPlante, Ph.D.—extension entomology
R. Namba, Ph.D.—insect transmission of plant pathogens
T. Nishida, Ph.D.—ecology and biological control
M. Sherman, Ph.D.—toxicology
M. Tamashiro, Ph.D.—insect pathology

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

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

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

Graduate programs in entomology encompass independent study, course work and research. The thesis based on original research is the major part of the master’s (Plan A) and doctoral programs. All candidates must take a general examination, diagnostic in nature, early in their program.

The department offers a master’s degree program under either Plan A (thesis) or Plan B (nonthesis). All master’s degree candidates are first enrolled under Plan A, the thesis program. Under Plan A, a minimum of 16 semester hours of course work, 2 semester hours of directed research, 2 semester hours of seminar and 10 semester hours of thesis research will be required. Under Plan B, a minimum of 26 semester hours of course work, 2 semester hours of directed research and 2 semester hours of seminar will be required. A final oral examination is required for students under Plan A and Plan B. The doctoral program in entomology requires the candidate to pass an examination in one foreign language. The foreign language required is determined by the doctoral committee and the candidate. Four semester hours credit for seminar are required. Academic credit is given for a master’s degree from a recognized institution. The remaining academic credits required are determined by the doctoral committee.

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.

Food Science

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

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

The department offers a master of science degree program under either Plan A (thesis) or Plan B (nonthesis). Intended candidates should have undergraduate preparation in chemistry through quantitative and organic, physics, mathematics through college algebra and trigonometry, and biology (including general microbiology as well as some other biological science).

Students are advanced to candidacy on the recommenda-
tion of their adviser after taking written general examinations which are diagnostic in nature. A committee consisting of three faculty members will set course requirements, guide thesis work, and conduct the final examination. Courses are selected from those offered in the major field of food science and in related fields such as chemistry, biochemistry, microbiology, nutrition, public health, and agriculture.

Under Plan A, a minimum of 18 semester hours of course work and 12 semester hours of thesis research are required. Thesis work in food science may be carried out in one of the following areas: food technology (including tropical fruit and seafood processing), biochemistry, chemistry, microbiology, engineering, sensory evaluation, irradiation, safety (including detection and metabolism of pesticides and natural toxins), fermentation, and waste product utilization. Under Plan B, a minimum of 30 semester hours of course work is required. All candidates (Plans A and B) must take Food Science 620 and 701. A final seminar presentation and an oral examination on the thesis (Plan A) or on a selected topic (Plan B) are required for all students.

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

FRENCH

Graduate Faculty

D. B. Aspinwall, Ph.D. (Chairman)—poetry, 20th-century literature
L. Forno, Ph.D.—17th-, 18th-century literature
E. Jackson, Ph.D.—novel, criticism, 19th-century prose
H. Niedzielski, Ph.D.—medieval language and literature, phonetics
M. Baciu, Doct. de l'Univ.—theatre of absurd, surrealism
M. Ignatius, Ph.D.—medieval, 20th-century literature
E. Zants, Ph.D.—19th-, 20th-century literature

Candidates may emphasize either French literature or linguistics and the methodology of language teaching, and in each case may select a thesis program (Plan A), or a nonthesis program (Plan B). Normally, all candidates in both plans are required to take 10-12 credits in French literary courses. Reading proficiency in a second foreign language is to be demonstrated by passing the examination stipulated by the Graduate Division. Some Latin is desirable. It is to be recognized that all specified requirements are minimal. A program for each individual will be worked out on the basis of the results of the preliminary conference and general examination.

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

Under Plan A degree requirements include 30 credit hours: a minimum of 24 hours of course work and a minimum of 6 hours thesis research. Of these, a minimum of 12 hours, exclusive of research methods course, must be in French courses numbered 600-799, including at least one graduate seminar. 4 to 6 credits of European history if not taken as an undergraduate, are required as well as EL 630 (Research Methods) which carries 1 credit only in French, 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 and a thesis. Up to 8 credits in related fields may be elected.

Under Plan B degree requirements include 30 hours of course work of which a minimum of 12 credits exclusive of research methods and Fr 661 (Stylistics) must be earned in French courses numbered 600-799 including at least one graduate seminar. 4 to 6 credits of European history if not taken as an undergraduate are required as well as EL 630 (Research Methods), Fr 661 (Stylistics), Ed CI 640 (Methods of Teaching French) and EP 416 (Tests and Measurements). Additional requirements are written and oral comprehensive examinations. Up to 8 credits in related fields may be elected.

FRENCH (Fr)

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

EUROPEAN LANGUAGES (EL)
620 Seminar: Topics in Language and Literature (3)
630 Seminar in Research Methods (v)

CURRICULUM AND INSTRUCTION (Ed CI)
640 Seminar in Teaching Fields (3)
Genetics

Graduate Faculty

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

Affiliate Faculty

S. L. Halperin, Ph.D.—genetical psychology

Both M.S. and Ph.D. degrees in genetics are offered. The M.S. Plan B is based on 30 credit hours of course and laboratory work and is available to students who feel they would benefit from a knowledge of genetics and genetic techniques in their chosen careers: for example, medical students, medical technologists, paramedical personnel, psychologists and social scientists. The courses are mainly oriented to human genetics and a typical program consists of Genet 480, 611, 618, 671, 672, 701, 702, 712, one semester of 699 and two semesters of 654, plus clinical biochemistry (MT 471-472) or basic biochemistry and lab (Bioch 441-2).

The Plan A M.S. is also offered and the required course work consists of Genet 480, 618, 650, four semesters of 654 and Bioch 441, plus other courses from the department's graduate offerings to bring the total to at least 20 credit hours. The M.S. thesis counts as 10 units of credit.

The Ph.D. has the same formal course requirements as the Plan A M.S. A written and oral comprehensive examination is given following completion of formal course requirements, and the degree is completed by submission and defense of an acceptable dissertation.

Candidates with the M.S. in an appropriate discipline may register for the Ph.D. program. Individuals who pass the department's qualifying examination may register for the Ph.D. without first obtaining the M.S. degree, with the concurrence of the department faculty.

Ph.D. candidates are expected to indicate their main areas 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 professor concerned agree.

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 and statistical genetics an adequate mathematical background is desirable. For molecular genetics, organic and biochemistry backgrounds are desirable. The Graduate Record Examination (aptitude and advanced test in biology) and two letters of recommendation are required of all applicants.

GENETICS (Genet)

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<td>Genetics Clinic (3)</td>
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<td>Thesis Research (v)</td>
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Geography

Graduate Faculty

R. J. Fuchs, Ph.D. (Chairman)—economic and urban geography, Soviet Union
R. W. Armstrong, Ph.D.—public health and human ecology
O. W. Bach, Ph.D.—urban climatology, air pollution meteorology
J. H. Chang, Ph.D.—climatology, agriculture, China
S. D. Chang, Ph.D.—China, cartography
M. Chapman, Ph.D.—population, mobility systems, Melanesia
R. J. Earickson, Ph.D.—social and urban geography, theoretical models and quantitative methods
D. W. Fryer, Ph.D.—economic development, Southeast Asia
G. A. Fuller, Ph.D.—population (fertility, policy aspects, diffusion), geography of prophylaxis
J. R. Healy, Ph.D.—cultural geography, Southeast Asia, Hawaii
D. H. Kornhauser, Ph.D.—urbanization and impact of technological change, Japan
B. J. Munson, Ph.D.—historical, perceived environments, tropical agriculture, South Asia
P. N. D. Pirie, Ph.D.—population-resource interrelations and management, Pacific
F. R. Pitts, Ph.D.—cultural geography and computer applications, Korea and Japan
P. J. Schwind, Ph.D.—urban and regional systems analysis and planning
A. R. Sommarstrom, Ph.D.—environmental quality, conservation, recreation
J. M. Street, Ph.D.—tropical agricultural ecosystems, modification of biosphere

Emeritus

N. M. Bowers, Ph.D.—South Asia, Micronesia, political geography

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

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

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

Social Geography: spatial analysis of social behavior, mobility systems, innovation diffusion.
Economic Geography and Development Problems: tropical agriculture, urban and regional systems, migration and development.
East, Southeast, South Asia and the Pacific.
Field, quantitative and computer methods; model building; cartography and remote sensing.

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.

M.A.

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

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

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

In consultation with the advisory committee, the candidate will plan a coherent study program of departmental offerings and pertinent courses from other departments. The student must develop a primary field of systematic specialization consisting of at least 9 credit hours and a secondary area of interest, regional or systematic, that normally will consist of at least 6 credit hours. All students are required to take Geography 695-6 and 791. Also required is a quantitative methods course (Geography 380) or alternatively the candidate may pass the final examination for the course.

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

Ph.D.

Admission to the Ph.D. program is highly selective and based upon demonstrated competence in previous work and promise of research ability. Applicants must submit the materials required for M.A. admission. Students who have completed M.A. degrees in fields other than geography may be considered for admission to the Ph.D. program. If admitted, however, they must undertake any remedial course work recommended by the department.

The Ph.D. program will consist of advanced courses and research seminars in the department, independent reading and research, and work in related disciplines. 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) a minimum of 12 credit hours each in a primary field of systematic specialization and a second field of interest, regional or systematic. In total, a Ph.D. program shall consist of no less than 39 credit hours, not including audit, pass/fail or credit/no credit options; (2) adequate work in supporting discipline(s) to be decided by the advisory committee in consultation with the student; (3) familiarity with the general development of geographic thought (Geog 691 or the equivalent).

Ph.D. candidates are expected to develop research skills beyond those required of M.A. students. All Ph.D. candidates must demonstrate competence in:

1) Two languages (except that Chinese or Japanese alone will fulfill this requirement);
or
2) One language and quantitative methods;
or
3) One language and field/laboratory techniques.
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.

GEOGRAPHY (Geog)

Systematic Physical Geography

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

Systematic Human Geography

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

Area Courses

350 Geography of Asia (3)
368 Geography of Hawaii (3)
440 Geography of the United States and Canada (3)
445 Geography of the Soviet Union (3)
452 Geography of Japan (3)
453 Geography of China (3)
455 Geography of South Asia (3)
456 Geography of Southeast Asia (3)
461 Australia and New Zealand (3)
465 Geography of the Pacific (3)
630 Seminar in Geography of Asia (3)
(1) Asia
(2) China
(3) Japan
(4) Southeast Asia
(5) South Asia
665 Seminar in Geography of the Pacific (3)

Techniques and Methodology

375 Introduction to Cartography and Airphoto Methods (3)
380 Quantitative Methods in Geography (3)
470 Remote Sensing (3)
475 Cartographic Production (3)
476 Advanced Cartography (3)
680 Advanced Quantitative Methods in Geography (3)
685 Computer Applications in Geography (3)

Reading, Research, General

691 History of Geographic Thought (3)
695 Pro-seminar I—Models in Geography (3)
696 Pro-seminar II—Research Design (2)
700 Seminar in Geography (3)
750 Research Seminar (3)
791 Field Camp (I)
799 Directed Research (v)
800 Thesis Research (v)

Geology and Geophysics

Graduate Faculty

A. T. Abbott, Ph.D. (Department Chairman)—geomorphology, economic geology
W. M. Adams, Ph.D.—seismology, applied geophysics
M. N. Bass, Ph.D.—geochemistry, tectonics, petrology
E. Berg, Ph.D.—geophysics, seismology
D. C. Cox, Ph.D.—hydrology, groundwater and engineering geology
K. I. Daugherty, M.S.—physical geodesy
P. F. Fan, Ph.D.—marine geology, geology of Asia
A. S. Furumoto, Ph.D.—seismology, geophysics
R. H. Johnson, Ph.D.—geophysics
S. H. Laurila, Ph.D.—geodesy, electronic surveying
G. A. Macdonald, Ph.D.—volcanology, igneous petrology
A. Malahoff, Ph.D.—geomagnetism, gravity
M. H. Manghani, Ph.D.—high pressure geophysics and geochemistry
R. Moberly, Ph.D.—marine geology, sedimentology
J. J. Naughton, Ph.D.—geochemistry
K. A. Pankiwskyj, Ph.D.—metamorphic geology, silicate phase petrology
J. E. Peterson, Ph.D.—hydrogeology, engineering geology
J. M. Resig, Dr. rer. nat.—micropaleontology
J. C. Rose, Ph.D.—gravity, marine geophysics
G. H. Sutton, Ph.D.—seismology, exploration geophysics
G. P. Woollard, Ph.D.—gravity, seismology, geomagnetism

Affiliate Faculty

R. L. Christiansen, Ph.D.—volcanology
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
D. W. Peterson, Ph.D.—volcanology

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

Degree Requirements

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

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

Intended candidates will be accepted from undergraduate majors in the natural sciences, mathematics, and engineering, and normally would be expected to have completed at least one year each of college mathematics, geology, physics, and chemistry. Adequacy of each applicant's additional preparation will depend on the particular branch of geology and geophysics to be pursued. At the time of his application, the student should state the area or areas in which he intends to study. Those in the following list are active fields of research in the department. For each, the normal undergraduate preparation is listed.

Students entering the area of general geology, must have had at least one semester each of mineralogy, petrology, structural geology, and geological field methods. For general geophysics, the student must have a good foundation in physics or engineering, and in mathematics. Students entering geodesy should be familiar with the principles of surveying and photogrammetry, and as a minimum, have taken general physics and mathematics through calculus. Background for hydrology and engineering geology will require courses in all of geology, physics, chemistry, and mathematics. For marine geology and geophysics, the undergraduate background should be such that the student can commence formal work in sedimentology, exploration geophysics, tectonics, and physical oceanography. Students entering seismology must have a strong background in physics or engineering and in mathematics. For volcanology and petrology, students must have a background that includes mineralogy and optical mineralogy, petrology, structural geology, and geological field methods.

Undergraduate deficiencies, which must be made up, will be listed on the basis of the applicant's transcripts, and from the results of an entrance placement examination as part of the preliminary conference with the departmental graduate work committee during the time of registration.

Information on the course of study and research opportunities in each of the fields of interest listed above, and on financial aid, can be obtained from the department.

Progress

Space and financial assistance are at a premium, and each student's progress will be reviewed annually.

GEOLOGY AND GEOPHYSICS (GG)

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<tr>
<th>Course</th>
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<td>302</td>
<td>Petrology (3)</td>
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<td>303</td>
<td>Structural Geology (3)</td>
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<td>305</td>
<td>Geological Field Methods (2)</td>
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<td>306</td>
<td>Work of Water (4)</td>
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<td>316</td>
<td>Geomorphology (3)</td>
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<td>351</td>
<td>Seismology (3)</td>
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<tr>
<td>360</td>
<td>Principles of Geophysics (3)</td>
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<td>411</td>
<td>Palaeontology (3)</td>
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<td>412</td>
<td>Micropalaeontology (3)</td>
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<td>415</td>
<td>Regional Geology (2)</td>
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<td>424</td>
<td>Advanced Mineralogy (5)</td>
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<td>425</td>
<td>Geochemistry (3)</td>
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<td>426</td>
<td>Advanced Petrology (3)</td>
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<td>430</td>
<td>Geology of Asia (2)</td>
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<td>440</td>
<td>Economic Geology (2-2)</td>
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<td>454</td>
<td>Engineering Geology (3)</td>
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<td>455</td>
<td>Ground-water Geology (4)</td>
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<td>457</td>
<td>Introduction to Geodetic Science (3)</td>
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<td>465-466</td>
<td>Geophysical Exploration (4-4)</td>
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<td>471</td>
<td>Magnetic Field of the Earth (3)</td>
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<td>481</td>
<td>Potential Theory (4)</td>
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<td>482</td>
<td>Elements of Space Science (3)</td>
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<td>601</td>
<td>Seminar in Volcanology (2)</td>
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<td>602</td>
<td>Seminar in Petrology (2)</td>
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<td>603</td>
<td>Seminar in Engineering and Ground-water Geology (3)</td>
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<td>607</td>
<td>Seminar in Ore Deposits (2)</td>
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<td>609</td>
<td>Seminar in Geomorphology (2)</td>
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<td>614</td>
<td>Advanced Field Study (v)</td>
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<td>619</td>
<td>Sedimentology (3)</td>
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<td>620</td>
<td>Stratigraphy (3)</td>
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<td>623</td>
<td>Marine Geology (3)</td>
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<td>625</td>
<td>Seminar in Current Research Topics (v)</td>
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<td>633</td>
<td>Solid State Geophysics (3)</td>
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<td>655</td>
<td>Seismic Source Mechanisms (3)</td>
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<td>656</td>
<td>Seismic Propagation Phenomena (3)</td>
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<tr>
<td>657</td>
<td>Analysis and Synthesis of Seismograms (3)</td>
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<tr>
<td>658</td>
<td>Seismometry and Seismological Model Study (3)</td>
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<td>659</td>
<td>Physics of the Earth's Interior (3)</td>
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<td>Seminar in Solid Earth Geophysics (v)</td>
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<td>661</td>
<td>Marine Geophysics (3)</td>
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<td>Principles of Theoretical Geophysics (3)</td>
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<td>665</td>
<td>Numerical Methods in Geophysical Data Analysis (3)</td>
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<td>671</td>
<td>The Magnetic Field of the Earth (3)</td>
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<td>672</td>
<td>Seminar in Geotectonics I (3)</td>
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<td>673</td>
<td>Seminar in Geotectonics II (3)</td>
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<td>674</td>
<td>Rock Magnetism and Paleomagnetism (3)</td>
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<td>Seminar in Geomagnetism (v)</td>
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<td>680</td>
<td>Seminar in Geodesy (v)</td>
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<td>681</td>
<td>Physical Geodesy (4)</td>
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<td>683</td>
<td>Satellite Geodesy (3)</td>
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<td>685</td>
<td>Adjustment Computation (3)</td>
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<tr>
<td>799</td>
<td>Directed Research (v)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (v)</td>
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</tbody>
</table>

German

Graduate Faculty

R. Seymour, Ph.D. (Chairman)—Germanic linguistics
J. Crean, Ph.D.—methodology
D. Dauer, Ph.D.—18th-and 19th-century German literature and philosophy
A. Moore, M.A.—linguistics and stylistics
J. Sang, Ph.D.—19th-and 20th-century literature
A. Schweizer, Ph.D.—18th-century literature, Classicism, and comparative literature

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

Plan A (thesis) and Plan B (nonthesis) are designed to meet the needs of two different types of students. Plan A is intended primarily for those desiring experience of writing a thesis. Plan B is intended primarily for those who prefer to pursue additional course work in literature, linguistics, and/or methodology of language teaching at the master's level.

Admission. In addition to the requirements of the Graduate Division, candidates should have majored in German as undergraduates. Applicants with less than a 3.0 average in their German major may be admitted provisionally. All must demonstrate, by means of a tape recording or by personal interview, an acceptable accent and a reasonable degree of fluency in German. Candidates should also present a minimum of 6 semester hours of related work (art, linguistics, history, philosophy, etc.).
Degree Requirements. A preliminary conference and general examination will be administered to determine the student’s program and objectives. During the first semester of residence the candidates must also take the M.L.A. Proficiency Examinations (speaking, reading, writing, and understanding) unless he presents satisfactory scores taken within the previous year.

Plan A (thesis) requires a minimum of 24 hours of course work (12 of which must be numbered 600-799, including at least one seminar and excluding the research methods course) and 6 credit hours of thesis research. Comprehensive examinations, thesis and final oral examination complete the degree. Plan B (nonthesis) requires a minimum of 18 credits in courses numbered 600-799 (including at least one seminar and 3 hours of EL 630) and no more than 12 hours selected from approved related courses. A final comprehensive examination, written and oral, completes the degree.

GERMAN (Ger)

409 Enlightenment-Strum Drang (3)
410 Classicism (3)
411 Romanticism (3)
413 German Literature from 1880 to 1918 (3)
414 German Literature from 1918 to 1950 (3)
415 Contemporary German Literary Activity (3)
428 Survey of German Lyric Poetry (3)
432 Stylistics (3)
451 Introduction to History of German Language (3)
452 Introduction to Middle High German (3)
489 Literature from the Beginnings to 1700 (3)
609-610 Middle High German (3-3)
615 History of the German Language (3)
616 History of the German Language (3)
632 German Stylistics (3)
650 Seminar: The German Essay (3)
651 Seminar: The German Novel (3)
652 Seminar: The German Drama (3)
653 Seminar: Lyric Poetry (3)
654 Seminar: The German Novel (3)
655 Faust I (3)
659 Directed Research (v)
735 Seminar (3)
800 Thesis Research (6)

EUROPEAN LANGUAGES (EL)

620 Seminar: Topics in Language and Literature (3)
630 Seminar in Research Methods (v)

CURRICULUM AND INSTRUCTION (Ed CI)

640 Seminar in Teaching Fields (3)

History

Graduate Faculty

S. Uhalley, Ph.D. (Department Chairman)—modern China, Chinese Communism
G. Akita, Ph.D.—Far East, modern Japan
E. D. Beechert, Ph.D.—United States economic
J. J. Connors, Ph.D.—European intellectual
C. B. Cowing, Ph.D.—United States social and economic
R. E. Cubberly, Ph.D.—early modern Europe, France
A. G. Dawes, 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
T. B. Lam, Ph.D.—Southeast Asia, Vietnam
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
B. E. McKnight, Ph.D.—Sung China
H. B. McElroy, Ph.D.—Asian immigration, education
V. D. Morris, Ph.D.—pre-modern Japan
I. A. Newby, Ph.D.—19th-century United States, Negro
G. R. Nunn, Ph.D.—Asia, research methods and resources
R. L. Rapson, Ph.D.—United States intellectual and cultural
R. K. Sakai, Ph.D.—Far East, modern Japan
A. W. Saville, Ph.D.—modern Europe, Germany
J. Sharma, Ph.D.—South Asia
M. Shinoda, Ph.D.—Far East, pre-modern Japan
M. P. Speidel, Ph.D.—ancient Europe, Roman Empire
J. Stalker, Ph.D.—recent United States social and economic
B. Stein, Ph.D.—India
J. J. Stephan, Ph.D.—modern Japan, Japanese foreign policy
R. Van Niel, Ph.D.—Southeast Asia, Indonesia
W. F. Vella, Ph.D.—Southeast Asia, Thailand
R. A. Wade, Ph.D.—Russian intellectual
J. A. White, Ph.D.—Russia, Russia in Asia

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

Intended candidates for the M.A. degree may select either the Plan A (thesis) or the Plan B (nonthesis) program. Plan A requires a minimum of 24 semester hours of graduate course work (at least 15 must be in courses numbered 600 to 799, including History 602), 6 semester hours of thesis research and a final oral examination. Plan B requires a minimum of 30 hours of graduate course work (at least 18 in courses numbered 600 to 799, including History 602), comprehensive examinations in two fields of history and a final oral examination. Covering a research paper originating in a graduate course and the two fields of history offered in the comprehensive examinations. Under both plans an intended candidate is required to give evidence of his competence in a foreign language appropriate to the area of his major interest. In some fields language competence is demonstrated by passing an examination in the language; in other fields, by completing or having completed 12 hours of college-level language study.

Intended candidates for the Ph.D. degree are expected to possess the M.A. degree in history or its equivalent. The Ph.D. candidate must demonstrate that he is capable of pursuing a successful career as a professional historian by showing initiative in historical research and by giving evidence of ability to present his findings both orally and in writing. He must prove his competence by acquiring a broad background in general history, passing four comprehensive examinations that show special academic knowledge in two broad geographic areas of history, and completing an original dissertation and a final oral examination. He must also demonstrate a knowledge of at least two foreign languages related to the dissertation topic; for candidates in United States or Pacific history an alternative requirement may, at the discretion of the doctoral committee, be substituted for one of the languages.
The department of history offers the Ph.D. in the Asian, American, Pacific and European fields. A student who plans to base his dissertation primarily on locally available resources should bear in mind that, although American and European resource materials for some topics are available, the University's particular resource strengths are in the areas of the Pacific and Asia.

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

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

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

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

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

### HISTORY (Hist)

#### Asia

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<tr>
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<tr>
<td>403</td>
<td>Topics in South Asian History (3)</td>
</tr>
<tr>
<td>405-406</td>
<td>History of Southeast Asia (3-3)</td>
</tr>
<tr>
<td>407</td>
<td>National and Regional History in Southeast Asia (3)</td>
</tr>
<tr>
<td></td>
<td>(1) Southeast Asia to 1300 A.D.</td>
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<tr>
<td></td>
<td>(2) Southeast Asia 1300 to circa 1750</td>
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<tr>
<td></td>
<td>(3) Modern Philippines</td>
</tr>
<tr>
<td></td>
<td>(4) Modern Malaysia</td>
</tr>
<tr>
<td></td>
<td>(5) Modern Indonesia</td>
</tr>
<tr>
<td></td>
<td>(6) Modern Vietnam, Laos, and Cambodia</td>
</tr>
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<td></td>
<td>(7) Modern Thailand</td>
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<td>(8) Modern Burma</td>
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<td>409-410</td>
<td>History of China (3-3)</td>
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<td>411-412</td>
<td>Local History of China (3-3)</td>
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<td>413-414</td>
<td>History of Japan (3-3)</td>
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<td>415-416</td>
<td>Imperial and Feudal Institutions of Traditional Japan (3-3)</td>
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<td>417-418</td>
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<td>Seminar in Mainland Southeast Asian History (3)</td>
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<td>Seminar in Indian History (3)</td>
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<td>(1) Ancient India</td>
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<td>(3) Muslim India</td>
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<td>(4) Modern South Asia</td>
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<td>665</td>
<td>Seminar in Japanese History (3)</td>
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<td>Chinese Historical Literature (3-3)</td>
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<td>717-718</td>
<td>Chinese Intellectual History (3-3)</td>
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#### The Pacific

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<td>723-724</td>
<td>China from 750 to 1700 (3-3)</td>
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<td>725-726</td>
<td>Contemporary China Seminar (3-3)</td>
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<td>727-728</td>
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<td>730</td>
<td>Japan: The Bakumatsu Period (1830-1873)</td>
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<td>733-734</td>
<td>Japanese Intellectual History (3)</td>
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<td>735-736</td>
<td>Seminar on Pre-Modern Japan c. 850-1800 (3-3)</td>
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#### Americas

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<td>422</td>
<td>History of Oceania (3)</td>
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<tr>
<td>424</td>
<td>History of the Hawaiian Islands (3)</td>
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<tr>
<td>425</td>
<td>The United States in the Pacific (3)</td>
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#### Europe

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<td>473-474</td>
<td>History of Spain and Portugal (3-3)</td>
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<td>(5) England</td>
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<td>618</td>
<td>British Empire and Commonwealth (3)</td>
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<td>Seminar in Russian History (3)</td>
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<td>620</td>
<td>Seminar in Russian Foreign Policy (3)</td>
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Horticulture

Graduate Faculty

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

Affiliate Faculty

R. V. Osgood, Ph.D.—herbicide physiology

Information and Computer Sciences

Graduate Faculty

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

The information and computer sciences M.S. program is intended to serve both the student who is interested in a career in information and computer sciences and the student who expects to use information and computer sciences in another profession. Prospective students must present a baccalaureate degree, and although students from all fields will be accepted, students whose undergraduate field of study was not business, engineering, mathematics, or science should consult with the program chairman before applying for admission. The Graduate Record Examination aptitude test is required for all applicants. The minimum requirements for admission to the program follow:

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

Plan A and Plan B are both available. Besides the general requirements of the Graduate Division for the master’s degree, the student’s program for either plan must conform to the following:
1. At least 18 credits from the courses listed below must be included in the M.S. program. Of the 18 credits, at least 3 credits must be taken from each of the three areas.

2. At least 9 graduate credits (600-799) must be ICS courses.

3. The remainder of the program shall ordinarily consist of other courses from this list or elective courses approved by the student’s program committee, which fit in with the student’s educational objectives.

4. All students must register at least once for ICS 690, Seminar in Information and Computer Sciences, as an extra credit to be graded on a CR-NC basis.

Area Courses

INFORMATION PROCESSING MACHINES — AREA 1

EE 461-462 Digital Systems and Computer Design (3-1)
ICS 466 Computer Organization and Programming Techniques (4)
ICS 467 Algorithmic Languages (4)
ICS 620 Software System Theory (3)
ICS 622 The Theory and Construction of Compilers (3)
ICS 627 Information Structures (3)
EE 660 Computer Organization (3)
ICS 665 Systems Programming (3)
ICS 710 Seminar in Software Systems (1)

LOGICAL ANALYSIS — AREA 2

EE 360 Logic Design (3)
Math 412 Introduction to Abstract Algebra (3)
Math 445 Logic (3)
Phil 445
EE 460 Digital Circuits (3)
ICS 621 Formal Linguistics (3)
Ling 625 Mathematical Properties of Natural Languages (3)
ICS 630 Information Processing in the Nervous System (3)
ICS 661 The Theory of Automata (3)
ICS 663 The Theory of Computability (3)
ICS 671 Artificial Intelligence (3)
ICS 720 Seminar in Automata and Computability Theory (1)

PROBABILISTIC ANALYSIS — AREA 3

ICS 371, Math 371 or 471, Probability (3)
ICS 443, Math 373 or 472, Statistics (3)
ICS 445 Introduction to Random Processes (3)
ICS or 446 Information Theory and Coding (3)
EE Math 631 Theory of Functions of a Real Variable (3)
ICS 641 Discrete State Stochastic Processes (3)
ICS 644 Pattern Recognition (3)
ICS 646 Parametric Methods in Time Series Analysis (3)
EE 646 Signal and Noise Theory (3)
EE 647 Applied Statistical Decision Theory (3)

ICS 648 Theory of Inference (3)
ICS 650 Time Series Analysis (3)
ICS 655 Applied Regression Analysis (3)
ICS 670 Multivariate Analysis (3)
Math 671 Advanced Probability (3)
Math 672 Stochastic Processes (3)
ICS 680 Statistical Decision Analysis (3)
ICS 730 Seminar in Time Series Analysis and Applications (1)

Library Studies

Faculty (General)

R. D. Stevens, Ph.D. (Dean)—government documents
I. W. Harris, Ph.D. (Assistant Dean)—reader services
J. B. Abrera, Ph.D.—cataloging, management
M. W. Ayrault, M.S. in L.S.—cataloging, organization of non-book materials
A. J. Fristoe, M.L.S.—administration
J. H. Haas, Ph.D.—reader services, documentation
E. Hurd, M.S.—children and young adult literature
A. Kamida, M.L.S.—cataloging
R. Kane, M.L.S.—science and technology
N. Lane, M.L.S.—reference and bibliography
G. R. Nunn, Ph.D.—Asian reference and administration
S. Saito, M. L. S.—reference and bibliography
E. T. Schofield, Ed.D.—audio-visual and school services
Y. Suzuki, M.L.S.—administration, Far Eastern collections, building library collections
M. G. Taylor, M.L.S.—reference and bibliography
S. Vann, Ph.D.—social functions, international librarianship, indexing
S. L. West, J.D.—social functions
J. Wheelwright, M.S. in L.S.—business and economics

The Graduate School of Library Studies, founded in 1965, prepares professional librarians for work in all types of libraries and provides opportunities for research and field study. The school’s program of studies leading to the master of library studies degree is accredited by the American Library Association.

Admission to the program is based on the following requirements:

1. Graduation from an accredited institution of higher learning with a bachelor’s degree representing a broad cultural background plus a field of specialization.
2. Evidence in the college record of above-average scholastic ability and promise for successful graduate study, usually shown by graduation with B average.
3. Evidence of professional promise as shown by reference reports and/or personal interviews.

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. Thirty to 36 credit hours of approved graduate study, depending upon previous education and library service, are required to complete the M.L.S. degree.

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

LIBRARY STUDIES CORE CURRICULUM (LS)

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

ELECTIVES

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

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

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

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

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

School librarians who wish to qualify for work in other states will require 36 hours of library school study, and an additional 10 credit hours is frequently designated in fields of education in certain states. Supervised practice work in school library, arranged by a faculty member of the School of Library Studies, is also required for certification in some states; and students who want to make sure that their degree will qualify them for certification in other states should make inquiries in advance through the dean’s office.

Applications for admission to the Graduate School of Library Studies and inquiries should be addressed to: Assistant Dean, Graduate School of Library Studies, 2425 Campus Road, Honolulu, Hawaii 96822. A catalog containing more detailed information is available on request to the above address.

Linguistics

Graduate Faculty

B. W. Bender, Ph.D. (Chairman)—phonology; general linguistics; Micronesian languages
D. Bickerton, M.A.—language variation; pidgins and creoles; language and literature
G. H. Fairbanks, Ph.D.—descriptive and comparative linguistics; Indo-European, especially Indo-Aryan, Slavic and Germanic
M. L. Forman, Ph.D.—general linguistics; linguistic anthropology; creoles and sociolinguistics, Philippine studies
G. W. Grace, Ph.D.—historical linguistics; Austronesian, especially Melanesian linguistics; ethnolinguistics
I. Howard, Ph.D.—theoretical linguistics; phonology; Japanese, Oceanic languages
R. W. Hsu, Ph.D.—phonology, computer techniques, programming languages; Micronesian languages
R. A. Jacobs, Ph.D.—syntax and syntactic change; Germanic, English, and American Indian linguistics
L. S. Josephs, Ph.D.—descriptive and theoretical linguistics; Japanese and Korean
P. G. Lee, Ph.D.—theoretical linguistics, phonology, syntax
A. V. Lyovin, Ph.D.—generative phonology; Chinese dialectology; Sino-Tibetan
H. P. McKaughan, Ph.D.—descriptive and theoretical linguistics; Philippine and Papuan languages
A. K. Pawley, Ph.D.—Fijian, Polynesian and New Guinea linguistics
A. M. Peters, Ph.D.—computational linguistics; child acquisition of language
L. A. Reid, Ph.D.—Philippine and Formosan linguistics; lexicography; tagmectics; discourse analysis
A. J. Schütz, Ph.D.—descriptive linguistics, field methods, lexicography; Fijian and other Melanesian languages; history of linguistics in the Pacific
S. Stareska, Ph.D.—theoretical linguistics; Asian and Pacific languages
L. C. Thompson, Ph.D.—descriptive and comparative linguistics, field methods: North American Indian linguistics; Southeast Asian linguistics
D. M. Topping, Ph.D.—descriptive and applied linguistics; Philippine and Micronesian languages
S. M. Tsuzaki, Ph.D.—descriptive and applied linguistics, languages in contact; Romance linguistics

Emeriti

S. H. Elbert, Ph.D.—comparative and descriptive linguistics; Hawaiian, other Polynesian and Micronesian languages; folklore
F. K. Li, Ph.D.—Chinese and Tai linguistics; other Sino-Tibetan languages; North American Indian linguistics

Cooperating Faculty

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

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

Departmental Requirements

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

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

**M.A.**

The department offers Plan A, Plan B and Plan C programs. In addition to the University-wide residence requirement of a minimum of two semesters of full-time work, all three programs require that the student demonstrate competence in one language other than his native language.

Plan A requires a thesis (12 units) and a minimum of 18 units of course work. However, all candidates must have taken at least one advanced seminar and must have completed the core of courses outlined above. A final oral examination, covering the thesis and related areas, is also required. Plan B requires a minimum of 30 units approved by the student’s adviser. It also requires a final written examination near the end of the course work.

Plan C is open to select students who have had some previous work in linguistics and who show both high potential for scholarly development and the motivation and discipline necessary for a more flexible and independent course of study. A general examination is given early in the first semester of graduate study to assess potential and diagnose strengths and weaknesses of all students in Plan C programs. Individual programs will be developed in consultation with the student’s program committee, a committee of three, the chairman of which will serve as the student’s chief adviser. Usually, in the interest of continuity, the same committee will administer both the general examination and the oral portion of the final examination. Plan C requires a final examination with both written and oral portions. The written portion coincides with the written final examination of Plan B. The oral portion permits the student’s program committee, after reviewing his performance on the written portion, to investigate his grasp of both weak and strong areas in greater detail and subject.

**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. It contains a general section, and one on phonology, grammar, and historical linguistics. A section on psycholinguistics is substituted for the one on historical linguistics for students committed to majoring in psycholinguistics. The final examination for the M.A. degree in linguistics may also serve as the qualifying examination for the Ph.D.

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

The comprehensive examination in linguistics is both written and oral. In addition to a comprehensive knowledge of the field of linguistics, all students except those majoring in psycholinguistics (see below) are expected to demonstrate strength in phonology, grammar, historical linguistics, and two additional areas of specialization chosen from among the following: phonetics, semantics, psycholinguistics, sociolinguistics, ethnolinguistics, computational linguistics, child acquisition of language, language learning and teaching, or the linguistics of any of the following areal or genetic groupings: Indo-European, Indo-Aryan, Slavic, Classical, Romance, Germanic, English, Tai, Austroasiatic, Chinese, Japanese, Korean, Austronesian, Philippine-Formosan, Indonesian, Micronesian, Melanesian, Polynesian, or American Indian linguistics. Integration of the required areas with one or more of the latter areal or genetic specializations is encouraged, especially in the case of historical linguistics, where the student is expected to demonstrate—in addition to a grasp of the general principles of historical and comparative methodology—a detailed familiarity with the history of one or more languages or language families.

The foregoing is intended as a general guide to the coverage intended for the comprehensive examination; in practice every attempt is made to tailor programs to the individual student’s background and interests—in some cases giving one of the optional areas greater emphasis, the other lesser. Also, other areas of specialization (including ones which are outside the discipline and which will be examined by the committee member from outside the department) may be included where such seem called for by the student’s total program and where adequate faculty supervision is available. Shortly after passing the qualifying examination, the student is expected to declare the optional areas he hopes to develop strength in. This information helps determine the composition of his program committee; details and relative emphases of the total program are then worked out in consultation with the committee.

**Psycholinguistics**

In addition to the minor specialization in psycholinguistics referred to above, a major concentration in psycholinguistics is also available as an option under the Ph.D. in linguistics program. Highly qualified holders of the M.A. in educational psychology, English as a second language, linguistics, psychology, or other related disciplines may be admitted to the program. Concentrations are available in theoretical, developmental, social, and educational psycholinguistics. Required courses beyond those in the linguistics core listed above include Ed EP 429, 608, 629; ESL 650, 660, 750; Psy 401, 655; and at least one seminar in the student’s area of concentration within psycholinguistics. (Students admitted to this Ph.D. program with major concentration in psycholinguistics who hold the M.A. in some discipline other than linguistics may be exempted from the 630 and 645 linguistics core requirements, and all students in the program are exempted from the requirement of demonstrating special strength in historical linguistics on the comprehensive examination; phonology, grammar, and psycholinguistics are the areas emphasized on the comprehensive examination in this program.) Suggested elective courses for students majoring in psycholinguistics include Anth 418; Ed EP 708; ESL 425, 720; Ling 414, 440, 470, 625, 635, 640, 650-651; Phil 417, 604, 605; Psy 320, 322, 423, 430, 431, 643, 654, 665, 730; Soc 422, 442, 741.
Courses

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

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

LINGUISTICS (Ling)

320 General Linguistics (3)
410 Articulatory Phonetics (3)
414 Introduction to Linguistic Anthropology (3)
421 Introduction to Phonological Analysis (3)
422 Introduction to Grammatical Analysis (3)
440 Introduction to Linguistic Semantics (3)
470 Introduction to the Study of Children's Speech (3)
611 Acoustic Phonetics (3)
615 The Nature of Language (3)
616 Phonology (3)
622 Grammar (3)
625 Mathematical Properties of Natural Languages (3)
630 Field Methods (3)
635 Language Variation (3)
640 Topics in Linguistics (3)
645 Language Variation (3)
650-651 Advanced Linguistic Analysis (3-3)
660 Historical Linguistics (3)
669 Directed Research (v)
730 Seminar (3)
760 Problems in Comparison and Pre-History (3)
770 Areal Linguistics (3)
800 Thesis or Dissertation Research (v)

Mathematics

Graduate Faculty

C. Allday, Ph.D.—algebraic topology
H. S. Bear, Ph.D. (Chairman)—functional analysis
E. Bertram, Ph.D.—group theory and combinatorics
R. Brown, Ph.D.—algebra and number theory
R. Colby, Ph.D.—ring theory
G. Csordas, Ph.D.—complex function theory
S. Fakhruddin, Ph.D.—ring theory
R. Freese, Ph.D.—lattice theory
F. Gleich, Ph.D.—functional analysis
C. Gregory, Ph.D.—applied mathematics
W. Hanf, Ph.D.—mathematical logic
H. Hilden, Ph.D.—topology
T. Hoover, Ph.D.—operator theory
F. Iha, Ph.D.—differential equations
J. Johnson, Ph.D.—universal algebra
S. Kranzle, Ph.D.—functional analysis
W. Lampe, Ph.D.—universal algebra
M. Lee, Ph.D.—functional analysis
A. Mader, Ph.D.—group theory
J. Martin, Ph.D.—topological dynamics
T. McDermott, Ph.D.—functional analysis
E. Mookini, Ph.D.—analysis
N. Nobusawa, Ph.D.—algebra
R. Pierce, Ph.D.—algebra
T. Pitcher, Ph.D.—probability theory
K. Rogers, Ph.D.—number theory
E. Spielvogel, Ph.D.—applied mathematics
L. Wallen, Ph.D.—functional analysis
B. Wells, Ph.D.—harmonic analysis
T. Wenska, Ph.D.—non-linear integral equations
J. Williamson, Ph.D.—complex function theory
R. Z. Yeh, Ph.D.—probability theory

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

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

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

MATHEMATICS

402 Partial Differential Equations (3)
403-404 Methods of Applied Mathematics (3-3)
407 Introduction to Numerical Analysis (3)
408 Numerical Solution of Differential Equations (3)
412-413 Introduction to Abstract Algebra (3-3)
420 Introduction to the Theory of Numbers (3)
431-432 Advanced Calculus (3-3)
442 Vector Analysis (3)
444 Theory of Functions of a Complex Variable (3)
449 Topics in Undergraduate Mathematics (3)
451 Projective Geometry (3)
455 Mathematical Logic I (3)
456 Mathematical Logic II (3)
471 Probability (3)
472 Statistical Inference (3)
611-612 Modern Algebra (3-3)
613 Group Theory (3)
615 Ring Theory (3)
617 Linear Algebra (3)
621-622 Topology (3-3)
631-632 Theory of Functions of a Real Variable (3-3)
633-634 Functional Analysis (3-3)
644-645 Analytic Function Theory (3-3)
649 Topics in Mathematics (3)
655 Set Theory (3)
671 Advanced Probability (3)
672 Stochastic Processes (3)
750 Seminar (v)
799 Directed Reading and Research (v)
800 Thesis Research (v)
Mechanical Engineering

Graduate Faculty

J. C. Burgess, Ph.D.—mechanics; acoustics
H. C. Chai, Ph.D.—heat transfer; heat exchanger
P. Cheng, Ph.D.—radiation; fluid mechanics
J. C. S. Chou, Ph.D.—environmental engineering; energy conversion
R. M. Fand, Ph.D.—heat transfer; fluid mechanics
J. S. Fox, Ph.D.—thermodynamics; combustion
K. M. Htun, Ph.D.—properties of materials; materials processing
D. H. Kidara, Ph.D.—fluid mechanics; heat transfer
J. Larsen-Basse, Ph.D.—materials science; corrosion
W. Stuiver, Ph.D.—mechanics; system dynamics

The department offers programs leading to the M.S. in mechanical engineering with areas of concentration in thermos­cience (e.g., heat and mass transfer, thermodynamics, fluid mechanics, energy conversion, thermal environmental engineering), in materials science (e.g., mechanical properties, corrosion, phase transformations, processing, marine materials) and in mechanics (e.g., dynamics, acoustics, continuum mechanics). Within these three areas of concentration students may opt for programs emphasizing either engineering science or engineering design; this option is reflected in the choice of both courses and thesis topic. Students are required to follow the Plan A (thesis) programs except that under special circumstances a petition to follow Plan B (nonthesis) may be granted by the graduate faculty.

Applicants for admission to study must present a B.S. degree or its equivalent in engineering or science. Before admission to candidacy the student must pass a general examination. This examination is given during the first semester. Applicants for graduate assistantships must submit the results of aptitude and advanced engineering tests of the Graduate Record Examination. A final examination is given to each candidate during his last semester of residence. For candidates enrolled under Plan A, the final examination consists of a seminar appearance; for those enrolled under Plan B, it consists of an oral examination. Prospective students may obtain additional information about the program by requesting a copy of the Mechanical Engineering Department Graduate Manual.

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

**MECHANICAL ENGINEERING (ME)**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>402</td>
<td>Computer Methods in Engineering (3)</td>
</tr>
<tr>
<td>403</td>
<td>Advanced Mathematics for Engineers I (3)</td>
</tr>
<tr>
<td>404</td>
<td>Advanced Mathematics for Engineers II (3)</td>
</tr>
<tr>
<td>422</td>
<td>Heat Transfer (3)</td>
</tr>
<tr>
<td>424</td>
<td>Introduction to Gasdynamics (3)</td>
</tr>
<tr>
<td>431</td>
<td>Electronic Processes in Materials (3)</td>
</tr>
<tr>
<td>433</td>
<td>Failures in Materials (3)</td>
</tr>
<tr>
<td>451</td>
<td>Automatic Control (3)</td>
</tr>
<tr>
<td>455</td>
<td>Nuclear Power Engineering (3)</td>
</tr>
<tr>
<td>473</td>
<td>Mechanical Vibration and Shock (3)</td>
</tr>
<tr>
<td>474</td>
<td>Fundamentals of Acoustics (3)</td>
</tr>
<tr>
<td>496</td>
<td>Mechanical Engineering Topics (v)</td>
</tr>
<tr>
<td>511</td>
<td>Classical Thermodynamics (3)</td>
</tr>
<tr>
<td>612</td>
<td>Statistical Thermodynamics (3)</td>
</tr>
<tr>
<td>617</td>
<td>Advanced Thermal Environmental Engineering (3)</td>
</tr>
<tr>
<td>621</td>
<td>Conduction Heat Transfer (3)</td>
</tr>
<tr>
<td>622</td>
<td>Convection Heat Transfer (3)</td>
</tr>
<tr>
<td>623</td>
<td>Radiation Heat Transfer (3)</td>
</tr>
<tr>
<td>624</td>
<td>Gasdynamics (3)</td>
</tr>
<tr>
<td>625</td>
<td>Numerical Methods in Fluid Mechanics and Heat Transfer (3)</td>
</tr>
</tbody>
</table>

626 Viscous and Turbulent Flows (3)
628 Theory and Measurement of Turbulence (3)
630 Materials Science Laboratory (2)
631 Advanced Materials Science (3)
635 Corrosion Theory (3)
636 Materials for the Ocean Environment (3)
641 Theory of Mechanical Properties of Solids (3)
642 Mechanical Behavior of Engineering Materials (3)
651 Automatic Control System Synthesis (3)
657 Methods of Search and Optimization (3)
671 Mechanics of Continua I (3)
672 Mechanics of Continua II (3)
676 Noise Control (3)
678 Advanced Dynamics (3)
691 Seminar (1)
696 Advanced Topics in Mechanical Engineering (v)
699 Directed Reading or Research (v)
800 Thesis (v)

Meteorology

Graduate Faculty

C. S. Ramage, D.Sc. (Chairman)—tropical meteorology
C. W. Adams, M.S.—climatology, physical oceanography
W. C. Chiu, Ph.D.—atmospheric turbulence and oscillations
P. A. Daniels, Ph.D.—physical meteorology, atmospheric pollution
C. M. Fullerton, Ph.D.—cloud physics
T. Murakami, D.Sc.—general atmospheric circulation, numerical methods
J. C. Sadler, M.S.—satellite meteorology, tropical meteorology
T. Takahashi, Ph.D.—cloud physics
R. C. Taylor, Ph.D.—tropical meteorology

Affiliate Faculty

S. Price, B.S.—physical meteorology

Degree Requirements (Plan A Only)

M.S. A minimum of 24 credit hours of course work and 6 credit hours of thesis research. General and thesis examinations are required.

Ph.D. A reading comprehension of one foreign language with useful scientific literature in the field of the candidate. At some time during his first year of residence, the Ph.D. candidate may be required to pass a screening examination prerequisite to proceeding toward a degree.

Intended candidates must present a thorough preparation in general physics, chemistry, and mathematics through calculus, as well as a minimum of 14 hours of undergraduate credit in meteorology including courses in climatology, instruments and observations, descriptive meteorology, and synoptic meteorology. Deficiencies in undergraduate preparation must be made up. Besides meteorology courses, courses may be allowed in the fields of oceanography, physics and mathematics.

**METEOROLOGY (Met)**

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>639</td>
<td>Meteorology of the Tropical Oceans (2)</td>
</tr>
<tr>
<td>640</td>
<td>Advanced Tropical Meteorology Laboratory (3)</td>
</tr>
<tr>
<td>641</td>
<td>Monsoon Meteorology (3)</td>
</tr>
<tr>
<td>642</td>
<td>Seminar in Meteorological Sensors (3)</td>
</tr>
<tr>
<td>643</td>
<td>Cloud Physics (3)</td>
</tr>
<tr>
<td>644</td>
<td>Physical Meteorology (3)</td>
</tr>
</tbody>
</table>

73
Microbiology

Graduate Faculty

M. Herzberg, Ph.D. (Chairman)—host-parasite relationships and immunology
B. G. Adams, Ph.D.—regulatory mechanisms of eucaryotic microorganisms
R. D. Allen, Ph.D.—ultrastructure and cell biology
P. Baumann, Ph.D.—taxonomy and physiology of marine bacteria
A. A. Benedict, Ph.D.—immunochemistry
L. R. Berger, Ph.D.—general microbiology and microbial physiology
D. E. Contois, Ph.D.—general microbiology and microbial physiology
C. E. Folsome, Ph.D.—microbial genetics and exobiology
K. R. Gundersen, Ph.D.—marine microbiology and ecology
J. B. Hall, Ph.D.—comparative biochemistry and evolution
P. C. Loh, Ph.D.—animal virology and animal cell culture
B. Z. Siegel, Ph.D.—comparative biochemistry and cell biology

The department offers programs leading to the M.S. and Ph.D. in microbiology with areas of specialization in microbial biochemistry, genetics, and ultrastructure; the biology of infectious diseases; the biochemistry and genetics of viruses; immunology and immunochemistry; marine microbiology; developmental and cell biology; and exobiology. Research programs in interdisciplinary fields are possible. Studies in microbiology emphasize fundamental cellular and molecular approaches rather than those primarily of an applied or diagnostic character.

Undergraduate preparation in both biological and physical sciences, including biology, genetics, microbiology, organic and physical chemistry, physics, and calculus is desirable, but deficiencies in some of these areas do not preclude admission. Qualified students with undergraduate majors in fields other than microbiology are welcomed. Ph.D. candidates are required to take an initial diagnostic examination and to demonstrate proficiency in one foreign language before graduation. Experience in teaching in a laboratory course is considered part of the training of the Ph.D. candidate. Official scores of the aptitude test and the advanced test in biology of the Graduate Record Examination and three letters of recommendation are required of all applicants.

Courses for the graduate program are to be selected from those listed below and from others offered in the related fields of biochemistry, biology, biophysics, botany, chemistry, genetics, mathematics, oceanography, public health, and zoology. Required courses are marked with an asterisk.

MICROBIOLOGY (Micro)

431 Microbial Biochemistry and Function (4)
441 Ultrastructure of Microorganisms (3)
451 Biology of Bacteria (4)
461 Immunology (3)
462 Immunology-Laboratory (1)
463 Microbiology of the Pathogens (4)
475 Microbial Genetics (4)
480 Microbial Ecology (4)
490 Virology (4)
625 Immunochemistry (3)
632 Advanced Microbial Physiology (3)
642 Marine Microbiology (3)
655 Virology (3)
665 Electron Microscopy (2)
671 Microbial Genetics (3)
675 Exobiology (3)
681 Host-Parasite Relationships (3)
*690 Seminar (1)
*699 Directed Research (v)
795 Special Topics in Microbiology (v)
800 Thesis Research (v)
Music

Graduate Faculty
A. Trubitt, D.M. (Chairman, Music Department)—music composition
A. P. Brown, Ph.D.—musicology
C. Chadwick-Cullen, M.M.—music performance, voice
R. Hines, M.M.—musicology, choral music
R. N. McKay, Ph.D.—music composition
L. Rowell, Ph.D.—music theory
A. Russell, A.M.D.—music composition
B. B. Smith, M.M.—ethnomusicology
M. Tait, Ed.D.—music education
R. Trimillos, Ph.D.—ethnomusicology
R. Vaught, Ph.D.—musicology
C. Wolz, M.A.—dance ethnology
N. Zumbo, M.S.—music performance, piano

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 theory. The M.M. in music is offered with a concentration in composition and in performance. It is important that a student declares the specific concentration for which he will be an intended candidate at the time of his application. This declaration is important in determining possible deficiencies.

It is recommended that applicants take the aptitude and advanced music test of the Graduate Record Examination and have reports sent to the music department. For concentration in ethnomusicology and dance ethnology some undergraduate background in cultural anthropology is desirable and, depending on the field of thesis research, may be required. For concentration in dance ethnology a background in movement notation is required. For concentration in music education a record of teaching experience should be presented. For concentration in music theory some composition study is highly desirable. For concentration in composition three original compositions should be submitted which are representative of previous work in various forms and media. For concentration in performance the student must appear in an audition or if the applicant is not in Hawaii an unedited tape recording may be submitted which includes works representative of his abilities in various styles.

Before being admitted to candidacy the student is required to successfully complete the general examination. This is divided into three parts, covering (1) a basic theory background as included in the first two years (one year for dance ethnology) of the undergraduate major, (2) a broad knowledge of music literature from the Middle Ages to the present and (3) achievement in the area of the concentration. Students concentrating in composition will be examined in the area of form and analysis, counterpoint and orchestration.

Concentrations in composition, dance ethnology, ethnomusicology, musicology and music theory follow the thesis plan only (Plan A). In composition the thesis consists of an original work in one of the larger forms plus a detailed essay on the background and problems involved or a detailed theoretical analysis. Concentration in performance follows the nonthesis program only (Plan B). Plan A requires 22 hours of course work and 8 hours of thesis. Plan B requires 30 hours of course work. For concentration in musicology a reading knowledge of French or German is required. Concentrations in music theory may fulfill their language requirement in either of the above languages or in Latin. For concentrations in ethnomusicology or dance ethnology, a reading or speaking knowledge of a foreign language (or equivalent technique in linguistics) is required. Candidates concentrating in music education may choose between the thesis program and the nonthesis program. A final oral examination is required in both the thesis and nonthesis programs.

Courses available for the graduate program are listed below.

**MUSIC (Mus)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>391-392</td>
<td>Movement Notation (2-2)</td>
</tr>
<tr>
<td>401</td>
<td>Ensembles (1)</td>
</tr>
<tr>
<td>402</td>
<td>Ethnic Music Ensembles (1)</td>
</tr>
<tr>
<td>403</td>
<td>Ethnic Dance Ensembles (1)</td>
</tr>
<tr>
<td>404</td>
<td>University Concert Choir (1)</td>
</tr>
<tr>
<td>405</td>
<td>Opera Workshop (3)</td>
</tr>
<tr>
<td>406</td>
<td>University Symphony Orchestra (1)</td>
</tr>
<tr>
<td>407</td>
<td>University Javanese Gamelan (1)</td>
</tr>
<tr>
<td>408</td>
<td>Collegium Musicum (1)</td>
</tr>
<tr>
<td>409</td>
<td>University Band (1)</td>
</tr>
<tr>
<td>420</td>
<td>Music Literature Laboratory (2)</td>
</tr>
<tr>
<td>(B) Voice</td>
<td></td>
</tr>
<tr>
<td>(C) Piano</td>
<td></td>
</tr>
<tr>
<td>421</td>
<td>Service Playing (2)</td>
</tr>
<tr>
<td>431</td>
<td>Advanced Applied Music (v)</td>
</tr>
<tr>
<td>432</td>
<td>Advanced Woodwind Methods (2)</td>
</tr>
<tr>
<td>433</td>
<td>Advanced Brass Methods (2)</td>
</tr>
<tr>
<td>435</td>
<td>Advanced Percussion Methods (2)</td>
</tr>
<tr>
<td>437</td>
<td>Asian and Pacific Music in Education (2)</td>
</tr>
<tr>
<td>438</td>
<td>Voice 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>465</td>
<td>Chamber Music (2)</td>
</tr>
<tr>
<td>466</td>
<td>Music of the United States (2)</td>
</tr>
<tr>
<td>467</td>
<td>Solo Song (2)</td>
</tr>
<tr>
<td>468</td>
<td>The Concerto (2)</td>
</tr>
<tr>
<td>469</td>
<td>Keyboard Music (2)</td>
</tr>
<tr>
<td>1470</td>
<td>Art Music of Asia (2)</td>
</tr>
<tr>
<td>1471</td>
<td>Music of Non-Literate Peoples (3)</td>
</tr>
<tr>
<td>477</td>
<td>Musical Cultures (2)</td>
</tr>
<tr>
<td>(B) Japan</td>
<td></td>
</tr>
<tr>
<td>(C) India</td>
<td></td>
</tr>
<tr>
<td>(D) Vietnam</td>
<td></td>
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<tr>
<td>(E) Indonesia</td>
<td></td>
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<tr>
<td>(F) Hawaii</td>
<td></td>
</tr>
<tr>
<td>(G) Korea</td>
<td></td>
</tr>
<tr>
<td>(H) Other</td>
<td></td>
</tr>
<tr>
<td>479</td>
<td>Undergraduate Topics in Ethnomusicology (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>600</td>
<td>Seminar (3)</td>
</tr>
<tr>
<td>(B) composition</td>
<td></td>
</tr>
<tr>
<td>(C) ethnomusicology</td>
<td></td>
</tr>
<tr>
<td>(D) musicology</td>
<td></td>
</tr>
<tr>
<td>(E) performance repertory</td>
<td></td>
</tr>
<tr>
<td>(F) music education</td>
<td></td>
</tr>
<tr>
<td>(G) dance ethnology</td>
<td></td>
</tr>
<tr>
<td>(H) music theory</td>
<td></td>
</tr>
<tr>
<td>601</td>
<td>Advanced Ensemble (1)</td>
</tr>
<tr>
<td>625-626</td>
<td>Advanced Conducting (2-2)</td>
</tr>
</tbody>
</table>

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

†Credit not available to candidates for a graduate degree in ethnomusicology.
NURSING

635 Graduate-Level Applied Music (v)
636 Graduate Recital (3)
651 Foundations of Music Education (2)
653 Music Curriculum Theory and Design (2)
657 World Musics in Undergraduate Education (2)
660 Studies in Music Literature (3)
   (B) Medieval
   (C) Renaissance
   (D) Baroque
   (E) Classic
   (F) Romantic
661 Bibliography and Research Methods in Music (3)
670 Regional Musics (3)
   (B) Asia
   (C) Oceania
678 Advanced Problems in Ethnomusicology
   (B) Transcription of Performance Practices (3)
   (C) Movement Analysis (2)
   (J) Other (v)
680 Studies in Music Theory (3)
   (B) Stylistic Counterpoint to 1700
   (C) Stylistic Counterpoint from 1700
   (D) Advanced Analysis
   (E) Comparative Theory
   (F) History of Theory
   (G) Media
690 Regional Dances (3)
   (B) Asia
   (C) Oceania
699 Directed Work (v)
800 Thesis Research (v)

Nursing

Graduate Faculty
E. Anderson, Ph.D. (Dean) (Chairman)—nursing research
L. Bermosk, M. Litt.—mental health-psychiatric nursing
Y. Gross, M.S.—curriculum

The program extends over four semesters and leads to a master of science degree. Under Plan B (nonthesis), a minimum of 48 semester hours must include: (1) one research course; (2) a seminar in nursing theory and practice; (3) courses in the area of specialization and related cognate fields; and (4) courses in a functional minor.

In addition to requirements for admission to the Graduate Division, the applicant must complete evidence of: (1) a baccalaureate degree with a major in nursing; (2) completion of a course in elementary statistics; (3) licensure in Hawaii for the practice of nursing; and (4) official scores on the Graduate Record Examination aptitude test.

Recommendations for admission to candidacy are determined at the end of the first semester after the student's progress has been reviewed and his ability to undertake graduate study has been determined. Upon admission to candidacy, a program adviser is selected from the graduate faculty in the selected area of specialization.

The student is eligible for graduation upon successful completion of the course of study with a cumulative grade-point average of 3.0, as well as a grade-point average of 3.0 in the nursing major.

Areas of specialization are offered in the following fields: (1) Mental Health-Psychiatric Nursing, which focuses on the clinical specialist practitioner in one-to-one relationship therapy, group therapy and family therapy in the context of community psychiatry; and (2) Medical-Surgical Nursing, which is designed to prepare clinical specialists in nursing practice with patients who have medical or surgical conditions requiring hospital care and associated institutional services.

In addition to an area of specialization, each student selects a functional area of concentration in either teaching or nursing-service administration.

Additional details on the graduate programs in nursing are given in a School of Nursing Bulletin, which is available upon request.

Nutritional Sciences

Graduate Faculty
R. Van Reen, Ph.D. (Chairman)—mineral metabolism, nutritional status
D. M. Hilker, Ph.D.—vitamins, toxic factors in foods
I. J. Lichten, Ph.D.—fluids and electrolytes, endocrinology
B. R. Standal, Ph.D.—protein metabolism, nutritional status
F. Young, Ph.D.—lipid metabolism, atherosclerosis

Intended candidates for the M.S. in nutritional sciences should present an undergraduate major in foods and nutrition or equivalent preparation in a related field which includes as a minimum pre-calculus mathematics, qualitative and quantitative chemical analysis, organic chemistry, biochemistry, vertebrate zoology, physiology, and general physics. Undergraduate deficiencies, as determined by the faculty, must be completed during the program of study. Courses for the graduate major will be selected from those listed below along with such courses in related fields as may be considered advisable. Only Plan A (thesis) is offered. Candidates are required to complete a minimum of 30 credit hours including 10 credit hours of FNS 800. Required courses are marked with an asterisk.

Additional details on the graduate program in nutritional sciences are given in a departmental brochure which is available upon request.
FOOD AND NUTRITIONAL SCIENCES (FNS)

676 Nutritional and Metabolic Diseases (2) (offered 1973-74)
677 Nutrition in Reproduction, Growth, Development and Senescence (3) (offered 1974-75)
679 Mineral Metabolism (2) (offered 1973-74)
*681 Seminar (1)
682 Nutritional Status (3) (offered 1973-74)
684 Lipids in Health and Disease (2)
*685-686 Advanced Human Nutrition (2-2)
*687 Advanced Nutrition Laboratory (3)
688 Vitamins in Health and Disease (2) (offered 1974-75)
*699 Directed Reading and Research (2)
*800 Thesis (10)

Ocean Engineering

Graduate Faculty
F. Gerritsen, Ing. dip. (Chairman)—coastal and harbor engineering
W. M. Adams, Ph.D.—geophysics, geophysical engineering
K. H. Bafthen, Ph.D.—physical oceanography
C. L. Bretschneider, Ph.D.—civil engineering, physical oceanography
N. C. Burbank, Sc.D.—environmental engineering
J. C. Burgess, Ph.D.—engineering mechanics
J. P. Craven, Ph.D.—ocean sciences, law
R. A. Grace, Ph.D.—hydrodynamics and water resources
G. W. Groves, Ph.D.—oceanography
H. H. Hwang, Ph.D.—electrical engineering
J. Larsen-Basse, Ph.D.—materials science
T. T. Lee, M.S.—coastal and harbor engineering
A. Parvulescu, Ph.D.—ocean acoustics, signal processing
L. Seidl, Ph.D.—naval architecture
M. W. Denis, D.Eng.—naval architecture
W. Stuiver, Ph.D.—mechanics, space dynamics
R. Szidar, Ph.D.—structures, applied mechanics
G. Venezian, Ph.D.—hydrodynamics, applied mathematics
J. A. Williams, Ph.D.—civil and ocean engineering, hydromechanics
K. Wyrtki, Ph.D.—physical oceanography

Affiliates
E. Link—Ocean Systems
G. Miller—ESSA
A. Tom—Sunn, Low, Tom & Hara, Inc.

The graduate program in ocean engineering is intended to channel the previous engineering experience of the student to ocean-related work. Students may select one of the following program areas to pursue their studies: coastal and harbor engineering, nearshore environmental engineering, marine structures, naval architecture and ocean acoustics. The department currently offers a master's and a doctoral program in ocean engineering.

M.S.

An intended candidate for the master's program is expected to have a bachelor's degree in any of the classical engineering disciplines with an adequate background in mathematics and physics. He may also apply for admission when he has completed his bachelor's degree in general engineering at the University of Hawaii with an option in ocean engineering. Candidates with degrees other than in engineering will be considered for admission, but they may be required to make up deficiencies. Official scores in the GRE aptitude and advanced engineering tests must be submitted upon application for admission.

The M.S. degree in ocean engineering can be earned by completing the requirements under one of two plans.

Plan A (thesis program) requires a minimum of 30 credit hours, including 22 hours of course work and 8 of thesis. Six credit hours may be taken outside the College of Engineering and the department of oceanography. Two credits of graduate seminars in engineering or oceanography are required. The course program requires 14 credit hours in engineering science and 8 in advanced design. A minimum of 18 credits must be earned in the courses numbered OE 600-799.

Plan B (nonthesis) requires a minimum of 30 credit hours of course work. Six credit hours may be taken outside the College of Engineering and the department of oceanography. Two credits of graduate seminars in engineering or oceanography are required. Of the total of 30 credit hours required for graduation, 15 must be in the engineering sciences and 15 in advanced design. A minimum of 18 credits must be earned in courses numbered OE 600-799.

Students must make a choice of plan and of option at an early time, preferably at the beginning of their study, but, in any case, before 14 credits of graduate work have been completed. A foreign language is not required.

All students will be required to take an entrance examination at the beginning of their studies. The purpose of this examination is to discover possible deficiencies in the student's academic background so that he can be advised on his course program.

After the completion of 15 credits of graduate work, the students will take the general examination, which is based on the student's course work and the basic sciences. The examination is intended to reveal the quality of the student's preparation and his ability to pursue work on the master's level. Successful completion of this examination will advance the student to candidacy.

In addition to the credit hour requirements, all students will be required to take a final oral examination. For Plan A the examination covers the thesis and related subjects. The examination is conducted by the thesis committee and is open to the graduate faculty. For Plan B the examination covers the presentation at a seminar of a written paper, which must be submitted to the committee in advance. The students will be questioned on the paper and related subjects.

The general and final examination may be repeated once. Students failing any of these examinations the second time, are not allowed to continue their studies in this program.

Ph.D.

Students seeking admission to the doctorate should normally have an M.S. degree in engineering. If they have an M.S. degree in another field, they may apply for a special examination to determine their qualifications. Exceptionally well-qualified students who meet the requirements for the M.S. program may be admitted to the Ph.D. program directly. Applicants must submit the official GRE aptitude score prior to admission.

A student pursuing the doctoral program is required to achieve a broad understanding of the principal areas of ocean engineering as well as a thorough understanding of a specific
area. The student must perform research in this area, culminating in a dissertation which must be an original contribution to the field. It must be a scholarly presentation, suitable for publication.

All intended candidates for the Ph.D. degree must take an oral qualifying examination. In addition to covering basic undergraduate fundamentals, this examination will test the student's understanding of selected subjects taken at the M.S. level. Students who wish to pursue a Ph.D. program in ocean engineering upon their successful completion of their M.S. program in the same field may elect to have their final examination for the M.S. degree count as their qualifying examination for their Ph.D. program. If they do, they must inform the department accordingly. To be advanced to candidacy, the student must, in addition, demonstrate adequate comprehension of one foreign language.

Approximately one year after being advanced to candidacy, all students must take a comprehensive examination, which will cover the student's general preparation in his area of specialty, and pertinent minor fields. The results of the examination will determine whether the candidate will be allowed to pursue the dissertation. The comprehensive examination will be in two parts, a written examination followed by an oral one.

The dissertation topic must be approved by a doctoral committee. After the dissertation is completed, it will be reviewed by the committee and a final oral examination will follow this review.

The qualifying and comprehensive examinations may be repeated only once. The final examination may not be repeated except with approval of the graduate faculty involved and the dean of the Graduate Division.

OCEAN ENGINEERING (OE)

401 Introduction to Ocean Engineering (3)
403 Fundamentals of Ocean Engineering (3)
411 Buoyancy and Stability (3)
412 Resistance and Powering of Ships (3)
461 Coastal and Harbor Engineering I (3)
462 Ocean Engineering Laboratory (3)
463 Oceanography for Ocean Engineers (3)
467 Wave Dynamics (3)
468 Statistical Analysis of Waves (3)
469 Principles of Ocean Engineering (3)
462 Seakeeping (3)
614 Ocean Hydrodynamics Laboratory (2)
621 Introduction to Ocean Acoustics (3)
622 Sonar System Engineering (3)
623 Electroacoustics (3)
631-632 Structural Design of Ocean Systems I & II (3)
651 Instrumentation Seminar (2)
652 Nearshore Marine Survey Techniques (3)
662 Coastal and Harbor Engineering II (3)
664 Sediment Transport, Littoral Drift and Dredging Technology (3)
681 Ocean Systems (3)
682 Design of Ocean Systems (3)
683 Ocean Engineering Design Project (3)
691 Special Topics in Ocean Engineering (v)
692 Seminar in Ocean Engineering (v)
694 Economics of Marine Resources (3)
696 Topics in Ocean Engineering (1-1)
699 Directed x Reading or Research (v)
800 Thesis Research (v)

Oceanography

Graduate Faculty:
J. E. Andrews (Chairman). Ph.D.—geological
J. E. Bardach. Ph.D.—biological
J. Caperon. Ph.D.—biological
K. E. Chave. Ph.D.—chemical
T. A. Clarke. Ph.D.—biological
B. S. Gallagher. Ph.D.—physical
R. M. Garrels. Ph.D.—chemical
R. W. Grigg. Ph.D.—biological
G. W. Groves. Ph.D.—physical
W. A. Hardy. Ph.D.—physical
P. M. Kroopnick. Ph.D.—chemical
A. Malahoff. Ph.D.—geological
S. V. Margolis. Ph.D.—geological
J. M. Miller. Ph.D.—biological
G. I. Murphy. Ph.D.—biological
E. D. Stroup. Ph.D.—physical
R. J. Tait. Ph.D.—physical
A. Woodcock. D.Sc. (Hon.)—physical
K. Wyrski. Ph.D.—physical
R. E. Young. Ph.D.—biological

Affiliate Faculty:
R. Barkley. Ph.D.—physical
R. W. Preisendorfer. Ph.D.—physical

The University currently offers a master's and a doctoral program in physical, chemical, geological, and biological oceanography.

Intended candidates should have a major in physics, chemistry, geology, geophysics, engineering, mathematics, biology, zoology, or botany. A minimum of one year of calculus, physics, and chemistry is required of all students prior to admittance. Graduate Record Examinations (advanced and aptitude) are required. Interested students should write to the department chairman for a brochure and further information.

Students pursuing a degree program must take the following courses or their equivalents: Ocean 620: 621: 622: 623.

Generally the student's first year is devoted to background work completing the four basic oceanography courses. Subsequently the student specializes, depending on his disciplinary inclination.

The M.S. Program (Plan A) requires a minimum total of 30 credit hours: including 18 credits of course work and 12 credits of thesis research. The student is also required to take an oceanography seminar course and must show qualification in digital computing.

A candidate for the Ph.D. must pass a comprehensive examination and a final oral examination in defense of his dissertation. He must qualify in one foreign language and digital computing.

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.

OCEANOGRAPHY (Ocean)

620 Physical Oceanography (3)
621 Biological Oceanography (3)
622 Geological Oceanography (3)
623 Chemical Oceanography (3)
630 Physical Oceanography Laboratory (1)
632 Littoral Geological Processes (3)
633 Chemical Oceanography Laboratory Methods (1)
Faculty include:
W. G. Hackler, M.A.—director
A. D. Moscotti, Ph.D.—associate director

OVERSEAS CAREER PROGRAM (OCP)
631-632 Asia-America: Studies of Men and Institutions (3-3)
791 Internship in an Asian country (3)

Pacific Islands Studies
Graduate Faculty
N. Meller, Ph.D. (Director)—political science
G. Daws, Ph.D.—history
S. Goto, Ph.D.—tropical agriculture
D. Kittelson, M.A.—Hawaiian curator
A. Leib, Ph.D.—literature
D. Oliver, Ph.D.—anthropology
P. Pirie, Ph.D.—geography
F. Tilton, M.D.—public health

Intended candidates for an M.A. in Pacific Islands studies must have an undergraduate background of 18 hours of credit (or the equivalent) in courses related to the Pacific Islands. The region is defined as Micronesia, Melanesia and Polynesia including Hawaii and New Zealand in their Polynesian aspects. These credits should include a Pacific-related survey course in anthropology, geography, or history. Candidates are urged to have a reading or field knowledge of a foreign language useful in thesis research. These would include French, German, Japanese, Spanish or any of the languages indigenous to the islands. Prerequisites may be satisfied by course work while enrolled at the University prior to admission to candidacy.

The graduate program in Pacific Islands studies is designed primarily for students who have taken a B.A. in a discipline and who wish to focus their work at the M.A. level regionally in the Pacific. Only the master’s degree is offered and this should be considered terminal. The degree is offered only under Plan A which requires a thesis. Graduate Record Examination aptitude scores must be submitted when applying for admission.

Requirements
a. At least 21 credit hours in graduate level courses, of which at least 12 credits must be in courses numbered 600-799, including at least 3 credits in a cross-disciplinary course concerned with the interrelationship of cultural and physical change in the Pacific.
b. A general examination designed to reveal the quality of the student’s preparation prior to the advance to candidacy. The thesis proposal is also reviewed and accepted at this time.
c. A completed thesis (carrying 9 credit hours) and examination.

Courses should be selected to provide an integrated program bearing upon a particular concentration of interest. At least three disciplines must be represented. A list of courses bearing upon the Pacific to be offered in any one year is available from the director. These courses will usually be

Overseas Career Program

The Overseas Career Program at the graduate level is a certificate program with a prescribed course of study designed to prepare Americans for service in Asia with governmental and international agencies, private institutions, and business; or service in fields concerned with Asians and Asian affairs. It is open only to students who are intended candidates for a graduate degree in one of the regular academic departments of the University and is designed to be useful to students who have not been abroad as well as to students who have lived in Asia.

Upon successful completion of the requirements of the Overseas Career Program (in addition to the requirements for the graduate degree in another field of study), an Overseas Career Certificate will be awarded. To obtain the certificate as well as the graduate degree will, in some cases, take a longer period of time than would be required for the degree alone.

Each student’s course of study is tailored to fit his individual needs in preparation for an overseas career. The requirements for the certificate include 15 hours of credit at the graduate level and competence in an Asian language:
6 hours—Asia-America: Men and Institutions, a two-semester interdisciplinary seminar required of all candidates for the certificate.
6 hours—two courses in area studies in one Asian country or region and related elective courses; one or both may be included in the student’s regular degree program.
3 hours—Internship in an Asian country, field experience for approximately 6 months with governmental or private agencies in Asia; periodic and final reports are required.

The requirements for an internship and area studies may be waived if the student presents satisfactory evidence of equivalent knowledge and experience.
found in the offerings of the following fields: agricultural economics, anthropology, architecture, art, English, geography, history, linguistics, music, political science, psychology, public health, sociology, speech-communication, and zoology-botany. Courses in other areas will be allowed if they contribute to an approved program.

PACIFIC ISLANDS PROGRAM (PIP)
390 Change in the Pacific (3)
690 Advanced Seminar Pacific Islands Studies (3)
699 Directed Reading and Research (v)
800 Thesis Research (v)

Pharmacology

Graduate Faculty
B. K. B. Lum, Ph.D., M.D. (Chairman)—autonomic and cardiovascular pharmacology
S. C. Chou, Ph.D.—molecular pharmacology
E. Furusawa, M.D.—virus chemotherapy
J. F. Lenney, Ph.D.—biochemical pharmacology
J. T. Miyahara, Ph.D.—neuropsychopharmacology
T. R. Norton, Ph.D.—medicinal chemistry
S. Ramanathan, Ph.D.—biochemical pharmacology
G. W. Read, Ph.D.—cardiovascular pharmacology
S. Shibata, M.D., Ph.D.—cardiovascular pharmacology

The department of pharmacology offers the requisite work for medical students, and for the M.S. and Ph.D. degrees.

Intended candidates for the M.S. or Ph.D. in pharmacology must have or acquire adequate preparation in biology, chemistry, physics and mathematics. The course work required includes basic courses in related sciences, or demonstrated competence in these fields, plus other courses adapted to the needs of the particular students as determined by the major professor and the thesis committee. Most students will be expected to take graduate courses in biochemistry, physiology and pharmacology. Elective courses in pathology, microbiology, anatomy, chemistry and clinical medicine will be recommended.

The departmental policies in regard to examinations which are optional to fields of study are as follows: (1) general examination for the M.S. degree: not required. (2) final examination for the M.S. degree: required. (3) Ph.D. qualifying examination: not required. A minimum of 30 credits of course work is required for the Plan A M.S. degree program of the department with 6 credits being derived from the thesis research work.

PHARMACOLOGY (Pharm)
201 Introduction to General Pharmacology (2)
203 General Pharmacology (3)
600 Pharmacology: Actions and Uses of Drugs (7)
613-614 Seminar in Pharmacology (1)
615 Toxicology (4)
631 Medicinal Chemistry & Structure-Activity Relations (3)
634 Molecular Pharmacology (2)
635 Experimental Chemotherapy (1)
637 Autonomic Nervous System Pharmacology (2)
639 Advanced Cardiovascular Pharmacology (2)
640 Neuropharmacology (2)
641 Pharmacological Techniques (v)
699 Directed Research (v)
800 Thesis Research (v)

Philosophy

Graduate Faculty
F. L. Bender, Ph.D. (Acting Chairman)—phenomenology, Marxism, existential philosophy
C. Y. Chang, Ph.D.—Taosim, Ch’an Buddhism, aesthetics
C. Y. Cheng, Ph.D.—philosophy of language, philosophy of mathematics, Confucian philosophy
I. M. Copi, Ph.D.—logic, metaphysics, analytical philosophy
E. Deutsch, Ph.D.—Indian philosophy, comparative philosophy, aesthetics
L. E. Goodman, D. Phil.—Islamic philosophy, metaphysics, ethics
D. J. Kalupahana, Ph.D.—early Buddhism, Chinese Buddhism
H. E. McCarthy, Ph.D.—history of philosophy, philosophy or art, philosophy in literature
W. E. Nagley, Ph.D.—nineteenth century, philosophy of religion, existential philosophy
K. N. Upadhyaya, Ph.D.—Indian philosophy, Buddhist philosophy
B. T. Yamasaki, Ph.D.—rationalism, Buddhism, philosophy of religion

Intended candidates for the M.A. or the Ph.D. must present a minimum undergraduate background of 30 credits in philosophy, including courses in history of philosophy, ethics, and logic. Related courses in anthropology, art, drama, Far Eastern studies, history, literature, mathematics, psychology, sociology, and the biological and physical sciences are recommended. In support of the application for admission, American students are encouraged to take the Graduate Record Examination (GRE)—both the aptitude (qualitative and quantitative) and the advanced test (No. 74: Philosophy)—and have the results forwarded to the philosophy department, prior to the application deadline. Three letters of recommendation are required and a sample of the applicant’s written work in philosophy may be requested in the case of an intended M.A. candidate but is required in the case of an intended Ph.D. candidate. The latter must also possess the M.A. degree in philosophy or its equivalent.

Degrees are offered in three specific areas of philosophy. (1) Western Philosophy. All graduate students in philosophy must acquire a thorough knowledge of the history and problems of Western philosophy whatever their field of specialization. On the basis of this foundation students may further specialize in Asian or Comparative Philosophy. (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 areas, Indian, Buddhist, or Chinese, with any area of Western philosophy.

M.A.

The department offers only the Plan B (nonthesis) program. The requirements for specialization in Western and in Asian or Comparative Philosophy are as follows:

Western: 30 credits of course work, including Symbolic Logic (Phil 445). At least one course in Asian or Comparative Philosophy, and at least six courses at the 600 level or above, including at least one seminar.
Asian or Comparative: 30 credits of course work, including Symbolic Logic I (Phil 445), introductory courses in Indian, Buddhist and Chinese Philosophy (Phil 450, 460, and 470) and six courses at the 600 level or above. Of these six courses, four must be in Western Philosophy and at least one must be a seminar.

Full-time students are required to take their final examination for their degree no later than their fourth semester in residence. The area of this examination will be selected by the student, with the approval of the departmental examination committee, from the set of departmental examinations.

Ph.D.

Although there is no formal minimum course requirement for the Ph.D., the student is required to spend three semesters in residence or the equivalent as a full-time student. During this period the student, in consultation with his adviser, should take courses in any areas of philosophy in which he may be deficient, in areas preparatory to his taking the departmental examinations, and in areas relevant to his intended field of dissertation research.

Reading competence in two Western foreign languages, selected to accord with the area of dissertation research, is required of each Western Ph.D. degree candidate; one Asian language for the Asian Ph.D. degree candidate; and one Asian and one Western foreign language for the Comparative Ph.D. degree candidate.

The Ph.D. candidate must demonstrate his general competence in philosophy by passing three written Departmental Examinations, one of which is in the history of Western philosophy, and an oral Comprehensive Examination. He must write and defend a dissertation which is an original contribution to knowledge, resulting from independent investigation, and of such quality as to be in principle publishable.

Additional details on the graduate programs 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 those listed in other related disciplines as approved by the candidate’s adviser. Graduate courses are numbered 600 or above; courses numbered 300-449 are upper-division undergraduate courses which may carry graduate credit.

Western

PHILOSOPHY (Phil)

300 Greek Philosophy (3)
301 Philosophy of Late Antiquity (3)
302 Medieval Philosophy (3)
304 British Empiricism (3)
306 Continental Rationalism (3)
308 Nineteenth Century (3)
310 Twentieth Century (3)
315 Ethical Theory (3)
340 Islamic Philosophy (3)
400 Political Philosophy (3)
401 Social Philosophy (3)
402 Philosophy of Law (3)
403 Marxist Philosophy (3)
405 American Philosophy (3)
410 Philosophy of the Physical Sciences (3)
415 Philosophy of the Social Sciences (3)
417 Theory of Knowledge (3)
418 Metaphysics (3)
420 Philosophy of Art (3)
422 Philosophy and Psychoanalysis (3)
425 Philosophy in Literature (3)
427 Kafka (3)
428 Samuel Beckett (3)
430 Existential Philosophy (3)
435 Philosophy of Religion (3)
440 Introduction to Phenomenology (3)
441 Introduction to Contemporary Analytic Philosophy (3)
444 Classical and Early Modern Logic (3)
445 Symbolic Logic I (3)
448 Comprehensive Philosophical Systems (3)
449 Philosophical Topics (3)
460 Problems of Philosophy (3)
465 Philosophy of Language (3)
611 Symbolic Logic II (3)
700 Individual Western Philosophers (3)
715 Philosophy of Mathematics (3)
720 Seminar in Ancient-Medieval Philosophy (3)
725 Seminar in Modern Classical Philosophy (3)
730 Seminar in Contemporary Philosophy (3)
795 Philosophical Texts (in original language) (3)
799 Directed Research (Greek, Modern Classical, Contemporary Western) (v)
800 Thesis Research (v)

Asian and Comparative

448 Comprehensive Philosophical Systems (3)
449 Philosophical Topics (3)
450 Indian Philosophy (3)
460 Buddhist Philosophy (3)
470 Chinese Philosophy (3)
485 Modern Japanese Philosophy (3)
600 Problems of Philosophy (3)
650 Individual Asian Philosophers (3)
655 Vedanta (3)
656 Indian Social Philosophy (3)
660 Theravada Buddhist Philosophy (3)
661 Mahayana Buddhist Philosophy (3)
662 Ch’an (Zen) Philosophy (3)
670 Confucianism (3)
671 Neo-Confucianism (3)
672 Taoism (3)
PHYSICS

750 Seminar in Indian Philosophy (3)
760 Seminar in Buddhist Philosophy (3)
770 Seminar in Chinese Philosophy (3)
780 Seminar in Comparative Philosophy (3)
795 Philosophical Texts (in original language) (3)
799 Directed Research (Indian, Buddhist, Chinese, and Comparative) (v)
800 Thesis Research (v)

Physics

Graduate Faculty

W. R. Steiger, Ph.D. (Chairman)—optics, atmospheric physics
R. J. Cence, Ph.D.—elementary particles
P. Crooker, Ph.D.—liquid crystals
P. N. Dobson, Ph.D.—theoretical physics
C. Hayes, Ph.D.—liquid crystals
B. L. Henke, Ph.D.—ultra-soft x-rays
J. R. Holmes, Ph.D.—optics, spectroscopy
H. C. McAllister, Ph.D.—optics, spectroscopy
S. Pakvasa, Ph.D.—theoretical physics
M. W. Peters, Ph.D.—high energy physics
V. Z. Peterson, Ph.D.—elementary particles
W. Pong, Ph.D.—solid state
V. J. Stenger, Ph.D.—elementary particles
S. F. Tuan, Ph.D.—theoretical physics
M. S. Watanabe, Ph.D.—theoretical physics
D. Yount, Ph.D.—elementary particles

Intended candidates for the M.S. or Ph.D. in physics must present a minimum of 35 semester hours of undergraduate credits in physics, including atomic and nuclear physics, electromagnetism, mechanics, optics, and thermodynamics. Courses in general chemistry and differential equations are also required. Official scores of the Aptitude test and the Advanced (Physics) test of the Graduate Record Examination must be submitted prior to admission. M.S. must be completed before Ph.D. is attempted.

Courses available for the graduate program are listed below. Required courses for the physics M.S. are marked with an asterisk. Additional courses may be selected, with approval, in mathematics, chemistry, meteorology, engineering, and philosophy. All graduate students are required to attend the weekly department seminar.

PHYSICS (Phys)

440 Solid State Physics (3)
490 Quantum Electronics (3)
*600 Methods of Theoretical Physics I (3)
601 Methods of Theoretical Physics II (3)
*610 Analytical Mechanics I (3)
*630 Electrodynamics I (3)
651 Electrodynamics I (3)
660 Advanced Optics (3)
*690 Seminar (0)
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 (3)
778 Elementary Particle Physics (3)
785 Solid State Theory (3)
*799 Directed Research (v) or 405 (max. 4 cr.)
800 Thesis Research (v)

Physiology

Graduate Faculty

S. K. Hong, M.D., Ph.D. (Chairman)—environmental and renal physiology
S. Batkin, M.D.—neuropsychology
K. D. Gardner, M.D.—renal physiology
H. L. Gilly, Ph.D.—physiology of sense organs
J. M. Hanna, Ph.D.—physiological ecology and human variation
F. T. Koide, Ph.D.—bioengineering
Y. C. Lin, Ph.D.—cardiovascular physiology
T. O. Moore, Ph.D.—environmental physiology, biorhythms
M. D. Rayner, Ph.D.—nerve-muscle physiology
T. A. Rogers, Ph.D.—environmental physiology
R. M. Smith, Ph.D.—environmental and comparative physiology
R. H. Strauss, M.D.—respiratory physiology and undersea medicine
G. C. Whittow, Ph.D.—thermoregulation, physiological ecology
W. T. Woodard, Ph.D.—learning theory, systems analysis, computer simulation

Affiliate Faculty

J. R. Claybaugh, Ph.D.—body fluid regulation
J. E. Hansen, M.D.—respiration physiology
J. Pegg, M.D.—diving and hyperbaric physiology
R. L. Pepper, Ph.D.—psychology, marine mammal biology

The department of physiology offers undergraduate and graduate courses and provides a major input to those interdisciplinary courses (Biomd numbers) which are required for first year medical students. Intended candidates for the M.S. or Ph.D. must have or acquire adequate preparation in biology, chemistry, physics and mathematics. Official scores of the GRE aptitude test must be submitted prior to admission. The course work required includes the graduate level Biomd courses and basic courses in related sciences, or demonstrated competence in these fields (which may include biochemistry, pharmacology, biophysics, or nutrition), plus other course work adapted to the needs of the particular student as determined by the major professor and the thesis committee. Students will be expected to develop a thorough knowledge of human, mammalian and/or comparative physiology with particular emphasis on their special fields of interest. All students must have or obtain adequate knowledge of the design of experiments, statistical methods, including the use of computers, and, in many instances, bioengineering and the use of isotopes in physiological research.

PHYSIOLOGY (Physl)

603-604 Seminar in Physiology (1-1)
605 Physiology of Nerve and Muscle (3)
606 Comparative Physiology of Thermoregulation (3)
607 Biophysical Concepts in Physiology (2)
608 Advanced Renal Physiology (3)
609 Advanced Cardiovascular Physiology (3)
611 Advanced Respiratory Physiology (3)
699 Directed Research (v)
701 Hyperbaric and Diving Physiology (3)
800 Thesis Research (v)

BIOMEDICAL SCIENCE (Biomd)

601 Cell Structure and Function (2)
602 Endocrinology and Reproduction (2)
603 Organ Structure and Function (5)
604 Neuroscience (4)
605 Microanatomy Laboratory (2)
606 Endocrinology and Reproduction Laboratory (1)
607 Physiology Laboratory (1)
Plant Pathology

See the Botanical Sciences field of study for M.S. and Ph.D. programs in the subdiscipline of plant pathology.

Political Science

Graduate Faculty

R. S. Cahill, Ph.D. (Chairman)—political theory, decision-making
T. Becker, Ph.D.—judicial process
D. Bwy, Ph.D.—political development
R. Chadwick, Ph.D.—international relations
J. A. Dator, Ph.D.—Japanese politics, political futures
H. J. Friedman, Ph.D.—comparative politics, comparative administration
M. Haas, Ph.D.—international relations, political development
M. Henningsen, Ph.D.—political theory
P. E. Jacob, Ph.D.—international organization, political development
H. S. Kariel, Ph.D.—political theory
G. Kent, Ph.D.—international relations
B. Kerkvliet, Ph.D.—comparative politics, political development
Y. Kuroda, Ph.D.—comparative politics, political socialization
O. Lee, Ph.D.—international relations
W. Levi, Ph.D., Dr. Jur.—international relations
N. Meller, Ph.D.—public administration, legislative behavior
M. Mezey, Ph.D.—legislative behavior
N. Milner, Ph.D.—judicial behavior
D. E. Neubauer, Ph.D.—political behavior
L. Nitz, Ph.D.—decision-making
G. D. Paige, Ph.D.—political leadership, development
F. W. Riegs, Ph.D.—comparative administration, development administration
I. H. Rohter, Ph.D.—political psychology
R. J. Rummel, Ph.D.—international relations, systems theory
G. Schubert, Ph.D.—judicial behavior
M. J. Shapiro, Ph.D.—political theory, decision-making
R. B. Stauffer, Ph.D.—comparative politics, political development

Applicants must submit to the department letters of recommendation, secure and fill out departmental application forms in addition to those of the Graduate Division, and if possible submit to the department scores from the aptitude tests of the Graduate Record Examination. Interested students should write the department chairman’s assistant for further information.

Information regarding the requirements for Plan A and Plan B master’s programs as well as requirements for the Ph.D. program in political science is available in other sections of this catalog and in a brochure entitled Graduate Study in Political Science. The latter is available in the department office or by writing to the Chairman’s Assistant, Department of Political Science, University of Hawaii.

All courses with the exception of 600-601 may be repeated for credit with permission of the adviser. The course content of all courses other than 600-601 may vary each semester or with each instructor. The thesis is granted 6 units for the Plan A master’s candidates.

POLITICAL SCIENCE (PolSc)

Scope and Methods

600 Scope and Methods of Political Science (3)
601 Political Analysis, Theory Building and Techniques (3)
602 Research Practicum (3)

Information regarding the requirements for Plan A and Plan B master’s programs as well as requirements for the Ph.D. program in political science is available in other sections of this catalog and in a brochure entitled Graduate Study in Political Science. The latter is available in the department office or by writing to the Chairman’s Assistant, Department of Political Science, University of Hawaii.

All courses with the exception of 600-601 may be repeated for credit with permission of the adviser. The course content of all courses other than 600-601 may vary each semester or with each instructor. The thesis is granted 6 units for the Plan A master’s candidates.

Political Thought

610 Political Thought (3)
710 Seminar: Political Thought (3)

Decision Making

620 American Government (3)
650 Public Administration Theory (3)
651 Functional Aspects of Public Administration (3)
660 Public Law and Judicial Systems (3)
670 Politics (3)
720 Seminar: American Government (3)
750 Seminar: Public Administration (3)
760 Seminar: Judicial Systems (3)
770 Seminar: Politics (3)

Political Development

640 Comparative Government and Politics (3)
650 Public Administration Theory (3)
660 Public Law and Judicial Systems (3)
670 Politics (3)
740 Seminar: Comparative Government and Politics (3)
750 Seminar: Public Administration (3)
760 Seminar: Judicial Systems (3)
770 Seminar: Politics (3)

International Relations

630 International Relations (3)
730 Seminar: International Relations (3)

Area Studies

680 Asian Politics (3)
780 Politics of Regions (3)

General

699 Directed Reading and Research (v)
800 Thesis Research (v)

Population Studies

Faculty

P. Pirie, Ph.D. (Director)—geography
M. Chapman, Ph.D.—geography
L. J. Cho, Ph.D.—sociology
J. Fawcett, Ph.D.—psychology
A. Howard, Ph.D.—anthropology
H. Overbeek, Ph.D.—economics
J. Palmore, Ph.D.—sociology
F. Rosario, Ph.D.—communications

Population studies is an interdisciplinary certificate program, involving faculty from several University departments, under the supervision of a population studies committee composed of the director of the program, and the chairmen of the departments of anthropology, economics, geography and sociology. The program is designed primarily for students who are candidates for an advanced degree—M.A., M.S., M.P.H. or Ph.D.—who wish to acquire an understanding of demographic structures and processes and to develop a special competence in the application of the concepts and tools of their primary discipline to various aspects of population study. The program emphasizes the social and economic aspects of the causes and consequences of population trends and examines the rationale and the ways by which societies attempt to modify these trends, with special reference to the Asian and Pacific area. Special attention is paid to training.
in techniques of demographic analysis appropriate to deficient or limited data.

Students who successfully complete 15 credits drawn from an approved list of courses, offered by the program and by several departments, and who pass a comprehensive examination, will be eligible to receive a Certificate in Population Studies.

POPULATION STUDIES (Pop)

650 Introduction to Demography (3)
691 Methods of Demographic Analysis (3)
692 Techniques of Estimation from Limited Data (3)
699 Directed Reading and Research (v)
750 Interdisciplinary Seminar in Population Studies (3)

Psychology

Graduate Faculty

R. C. Johnson, Ph.D. (Chairman)—social-developmental
A. Arkoff, Ph.D.—clinical
H. M. Bitner, Ph.D.—counseling; applied social
M. E. Bitterman, Ph.D.—comparative-physiological
R. J. Blanchard, Ph.D.—comparative-physiological
J. G. Carlson, Ph.D.—learning theory and human behavior extensions
T. J. Ciborowski, Ph.D.—developmental
D. H. Crowell, Ph.D.—developmental
J. M. Denny, Ph.D.—counseling
M. J. Diamond, Ph.D.—clinical-social
J. M. Digman, Ph.D.—personality
R. A. Dubanoski, Ph.D.—developmental
W. J. M. (Ian) Evans, Ph.D.—clinical
J. T. Fawcett, Ph.D.—social
L. M. Herman, Ph.D.—comparative-physiological
L. A. Jakobovits, Ph.D.—social; psycholinguistics
W. S. MacDonald, Ph.D.—clinical
H. H. Mansson, Ph.D.—social
A. J. Marsella, Ph.D.—clinical
K. A. Minke, Ph.D.—learning theory and human behavior extensions
M. D. Murray, Ph.D.—social
C. R. O’Donnell, Ph.D.—clinical
T. S. Rodgers, Ph.D.—psycholinguistics
S. I. Shapiro, Ph.D.—psychology of knowledge
A. W. Staats, Ph.D.—learning theory and human behavior extensions
G. Tanabe, Ph.D.—clinical-developmental
R. G. Tharp, Ph.D.—clinical
L. P. Ullmann, Ph.D.—clinical
D. L. Watson, Ph.D.—personality
H. B. Weaver, Ph.D.—applied social; environmental

Emeritus

C. J. Herrick, Ph.D.—clinical

Affiliate Faculty

H. Gudeman, Ph.D.—clinical
R. G. Gallimore, Ph.D.—social

Intended candidates for graduate degrees must present 18 hours of undergraduate work in psychology, including general and experimental psychology and statistics. The M.A. degree may be pursued only by Plan A (required thesis). At least 30 credit hours are required, of which no more than 6 credits may be in thesis research.

Programs leading to the Ph.D. are available in five fields of specialization: comparative-physiological; developmental; social-personality; clinical; learning theory and human behavior extensions. Applicants interested in further information should write to the chairman directly.

Intended candidates for the Ph.D. may, under special circumstances offer 30 course credits in lieu of the M.A. degree, although all students without the M.A. degree from an American university must enter the program as intended candidates for the M.A. degree.

Official transcripts of all higher education work, and 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. Three letters of recommendation are also expected.

Additional details concerning standards, programs, facilities, other requirements and financial assistance are available from the department.

Admissions will be considered for the fall semester only.

Clinical Psychology

The program in clinical studies is accredited by the American Psychological Association. The philosophy of the program is service based on science; the emphasis therefore is on the application of empiricism to both the study of human interaction and the practice of clinical psychology. The prime training goal is to bring together the roles of researcher and clinician, to unify the task of generating new knowledge with the task of applying knowledge to better the human condition. The clinical studies curriculum includes courses in research design and statistical analysis, behavior assessment, childhood and adult behavior disorders and their treatment, community psychology and intervention and cognitive approaches to pro-social change. A unique program of associated practica and on-going internships is sponsored
by various local community service agencies in conjunction with the clinical faculty.

PSYCHOLOGY (Psy)

675-676 Behavior Assessment (2-2)
677-678 Behavior Assessment Laboratory (1-1)
681 Childhood Behavior Disorders and Intervention (3)
682 Adult Behavior Disorders and Intervention (3)
683 Social Behavior Disorders and Intervention (3)
684 Cognitive Approaches to Behavior Change (3)
685 Practicum in Behavior Change: Community Issues (3)
686 Practicum in Behavior Change in Children (3)
687 Practicum in Behavior Change in Adults (3)
688 Practicum in Clinical Psychology (v)
790 Research in Clinical Psychology (3)
795 Internship (0-0)

Comparative-Physiological Psychology

The area of comparative and physiological psychology provides a broad background in comparative learning and animal behavior and their biological bases. Departmental laboratories provide research experience with a variety of species including marine mammals, fish, primates, and rats.

633 Comparative Psychology (3)
634 Physiological Psychology (3)
635 Sensory Processes and Psychophysics (3)
636-637 Learning and Motivation (3-3)
638 Selected Topics in Comparative Psychology (3)
642 Behavior Processes of the Marine Mammal (3)
649 Instrumentation (3)

Developmental Psychology

The developmental psychology concentration focuses on the experimental study of human development. The developmental program is designed to provide students with both a strong background in general psychology (e.g., learning) as well as extensive training in child psychology. Students meet these goals by completing certain course work and other training as recommended by their advisory committees.

The program’s design encourages students to acquire research skills by participating in research from the outset of their training. Such research is frequently accomplished by students joining existing research projects which helps to develop research sophistication, interests, and even proposals for thesis and dissertation work.

The current emphasis of the program is on the young child, especially on psychophysiological functioning of the infant, the development of social behavior and parent-child relationships, cognitive development, the effects of early experience and cross-cultural development. There is also a strong interest in the areas of language acquisition, child learning and behavior genetics.

653 Infant Development and Behavior (3)
654 Cognitive Development (3)
656 Children’s Social Development (3)
750 Research in Developmental Psychology (3)

Learning Theory and Human Behavior Extensions

The general purpose of this concentration is to provide a common core of work for graduate students which will focus upon the principles and methods of the field of learning, and also include courses that extend the basic principles to various areas of human behavior. In addition, the graduate student in the concentration will be expected to select some area of specialization within which he wishes to major. This area could be anywhere along the continuum from the basic field to applications of the principles to clinical, child, or social psychology, educational psychology, or areas in the social sciences—or to fields such as child learning, behavior modification, social learning, language and verbal learning, basic animal learning.

636-637 Learning and Motivation (3-3)
640 Verbal Learning (3)
643 Cognitive Processes (3)
645 Current Issues in Learning and Motivation (3)
655 Learning, Language, and Intellectual Function (3)

Social-Personality Psychology

The social-personality program seeks to provide students with the background, skills and opportunity to study the individual and his relationship to society. The student is encouraged to follow his individual interests whenever possible by means of an individualized course of study. Students are engaged in studies ranging from problems in psycholinguistics to the nature of human personality and current social problems, using techniques ranging from complex multivariate statistical procedures to various methods of field research. Hawaii’s rich mixture of racial and ethnic groups furnishes the opportunity to conduct a wide variety of cross-cultural studies.

660 Personality: Theory and Research (3)
661 Personality and Social Interaction (3)
662 Social Psychology (3)
663 Behavior in Groups (3)
664 Attitude Development and Change (3)
665 Cross-Cultural Psychology (3)
666 Psychology and Social Issues (3)
670 Applied Social Psychology (3)
671 Advanced Environmental Psychology (3)
760 Research in Personality (3)
762 Research in Social Psychology (3)
Other Psychology Courses

401 Analysis of Behavior (3)
423 History of Psychology (3)
424 Abnormal Psychology (3)
426 Industrial Psychology (3)
427 The Exceptional Child (3)
428 Social Development of Children (3)
432 Psychological Aspects of War and Peace (3)
434 Seminar on the Psychology of Knowledge (3)
471 Environmental Psychology (3)
485 Seminar on Humanistic Transpersonal Psychology (3)
490 Seminar on Psychology Today (3)
491 Teaching Psychology (3)
493 Practicum in Psychology (3)
499 Directed Reading or Research (v)
601 Introduction to Quantitative Methods (3)
602 Statistical Analysis (3)
603 Design and Analysis of Psychological Experiments (3)
605 Problems of Measurement and Evaluation (3)
606 Multivariate Methods (3)
699 Directed Reading or Research (v)

700 Seminar (3):
(1) General
(2) History and Theory
(3) Statistics and Measurement
(4) Experimental
(5) Physiological
(6) Personality
(7) Social
(8) Developmental
(9) Applied-Industrial
(10) Clinical
(11) Comparative
(12) Learning
(13) Perception
(14) Psychopathology
(15) Psychological Therapies

710 Seminar in Teaching Psychology (1)
714 Survey Research Methods (3-3)
730 Research in Experimental Psychology (3)
800 Thesis, Dissertation Research (v)

Public Health

Graduate Faculty

J. M. Michael, M.S.E., M.P.H. (Chairman)—public health administration and health planning
R. W. Armstrong, Ph.D., M.P.H.—comprehensive health planning
J. E. Banta, M.D., M.P.H.—international health
T. L. Bell, M.S.P.H., Ph.D.—public health laboratory
B. M. Bennett, Ph.D.—biostatistics
E. E. Bertelotti, M.P.H., M.S.—public health education and administration
N. C. Burbank, Jr., Sc.D.—public health administration and health planning
M. J. Chun, Ph.D.—environmental sanitation and public health engineering
C. S. Chung, Ph.D.—biostatistics
E. W. Clark, Dr.P.H.—public health education
R. H. Conway, Dr.P.H.—health services administration
L. E. Dickinson, M.D., Dr.P.H.—epidemiology
S. Furuno, M.S.P.H., Ph.D.—mental retardation
F. I. Gilbert, Jr., M.D.—community health
W. P. Golden, Jr., Ed.D.—public health education
J. Grossman, M.P.H., Ph.D.—public health education
J. H. Hankin, M.S., Dr.P.H.—public health nutrition
J. M. Johnson, Ph.D.—environmental sanitation
R. K. C. Lee, M.D., Dr.P.H. (Dean Emeritus)—public health administration
A. M. Lenzer, Ph.D.—gerontology
M. Lim, M.R.C.S., L.R.C.P., D.P.H.—population and family planning
Y. S. Matsumoto, Ph.D.—population and family planning
R. E. Mytinger, Dr.P.H.—health services administration
C. B. Park, M.D., Dr.P.H.—biostatistics
R. J. Pion, M.D.—population and family planning
A. D. Schwartz, M.D., M.P.H.—mental health
R. G. Smith, M.D., M.P.H.—maternal and child health
P. G. Stitt, M.D., M.P.H.—maternal and child health
R. Y. Suehiro, M.A., M.P.H.—international health
F. H. Tilton, M.D.C.M., M.P.H.—international health
E. Voulgaropoulos, M.D., M.P.H.—international health
N. B. Wiedevelopment, M.A.—comprehensive health planning
R. J. Wolff, Ph.D.—population and family planning
R. M. Worth, M.D., M.P.H., Ph.D.—epidemiology

Affiliate Faculty

E. W. Colby, M.D., M.P.H.—health services administration
A. Connor, M.D., M.P.H.—maternal and child health
K. McLaren, M.P.H.—public health nursing
W. B. Quisenberry, M.D., M.P.H.—public health administration
L. Rosen, M.D., Dr.P.H.—epidemiology

The School of Public Health offers a wide range of programs designed to meet the needs of a varied student body. In addition to basic work in public health common to all students in the School, candidates are expected to pursue intensive work in a selected area of emphasis within the public health field. The broad areas of program emphasis offered are: health services planning and administration (including comprehensive health planning, health services administration, public health administration); environmental health (including environmental management, environmental sanitation, public health engineering); international health and population and family planning studies; personal health services (including maternal and child health/mental retardation, mental health, gerontology); public health education; quantitative health sciences (including biostatistics, epidemiology, public health laboratory, public health nutrition). Program content may combine more than one area of emphasis for eligible students. Such expanded programs will usually require an additional semester of study. (Refer to School of Public Health Bulletin.) Admissions are usually considered for the fall semester only.

Master of Public Health Degree

The M.P.H. program is designed to prepare persons for a variety of careers in the broad field of public health at local, state, national, and international levels. The degree candidate must meet the minimum admission requirements of the Graduate Division. All applicants must take the GRE aptitude test. Depending upon the area of emphasis selected, different undergraduate preparation may be required; in some cases, at least two years of health or related work experience are also required. A candidate’s total curriculum is developed with the approval of his program committee. All candidates must complete 30 or more semester hours, including PH
791. A final examination or other final requirement as determined by the student's program committee must be completed before graduation. In some cases, degree requirements may involve up to two years of residence.

Master of Science Degree

The M.S. program is intended to provide students with a research-oriented education in a specific area of emphasis. A degree candidate must have at least a bachelor's degree from an accredited institution; his undergraduate record should show adequate preparation in the biological, physical, and social sciences. Additionally, at least two years' work experience in a health or related field is desirable. The program may require up to 24 months; both Plan A and B are available. In Plan A the minimum course requirement is 30 semester hours, including 6 credits for thesis research. A final oral examination on the thesis and related subjects is required. In Plan B, 30 or more semester hours, including PH 791, are required; a final examination or other final requirement as determined by the student's program committee must be completed before graduation. Students in fields other than public health, including unclassified, generally should obtain the instructor's approval prior to registration.

### PUBLIC HEALTH (PH)

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<td>800</td>
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Russian

Graduate Faculty

M. Klimenko, Ph.D. (Chairman)—19th and 20th-century literature
G. H. Fairbanks, Ph.D.—Slavic linguistics
T. Z. Gasinski, Ph.D.—Polish, Old Russian literature, linguistics
L. G. Heien, Ph.D.—methodology and testing, Russian language

Requirements for admission, in addition to those of the Graduate Division are:

1. B.A. from an accredited institution or the equivalent from a foreign university.
2. 3.0 average, on a 4.0 scale, in the undergraduate major for the last four undergraduate semesters (applicants with lower averages may be accepted provisionally; those with majors other than Russian will be required to make up deficiencies).
3. Acceptable accent and reasonable degree of fluency in Russian, as demonstrated in a personal interview or by tape recording. Applicants should send a five-minute single track tape of themselves speaking and reading Russian. The tape should not have been previously used.

The program provides the usual two plans of study. Plan A is the thesis plan, and Plan B nonthesis. Candidates following Plan A write a thesis and generally take 6 credits in one Slavic language other than Russian as part of the degree requirements. Candidates following Plan B normally emphasize courses in the Russian language. Candidates in both plans are urged to acquire a reading knowledge of a non-Slavic language.

For all degree candidates a conference will be arranged at the beginning of their first semester of study. The nature of the conference is mainly diagnostic, i.e. to assist the candidates and the program committee in preparing an individual program of study. Based on the results of the conference, the committee will prepare a reading list for the candidate.

All degree candidates must complete a minimum of 31 semester hours (including one credit in Research and Methods, EL 630). Candidates with appointments as graduate assistants will in addition take EdCI 640, Seminar in Teaching Russian.

All degree candidates will have to pass the MLA Teacher Proficiency Examination in the language skill areas.

Requirements in Plan A include:

A minimum of 12 credits in courses numbered 600-799, excluding EL 630 but including a minimum 3 credits in Graduate Seminar 735.

Six credits in thesis writing, Russian 800. Thesis must be completed and submitted at least three weeks in advance of the oral examination. The final oral examination will consist of two parts. The first part will be based on the thesis. Candidates must defend their points of view. The second part will be based on the minimum reading list.

Requirements in Plan B include:

Minimum of 18 credits in courses numbered 600-799, including either Russ 621 or Russ 650, and minimum 3 credits in Graduate Seminar, Russ 735, but excluding EL 630.

Maximum 6 credits of electives, including one appropriate course (3 credits) in linguistics and/or English as a second language.
Candidates must pass a comprehensive final examination, based on all fields of study of language and literature. The examination will be based on the minimum reading list.

RUSSIAN (Rus)
411-412 Literature of the 19th Century (3-3)
413-414 Literature of the 20th Century (3-3)
418 Advanced Composition and Stylistics (3)
419 Advanced Reading in Russian Daily Press (3)
495 Seminar in Russian Literature (3)
611 Russian Poetry (3)
614 Russian Drama (3)
618 Comparative Grammar of Russian and English (3)
619 Advanced Russian Syntax (3)
621 Historical Grammar of the Russian Language (3)
622 Reading in Old Russian Language (3)
641-642 Russian Literature X-XVII Centuries (3-3)
650 History of the Russian Literary Language (3)
699 Directed Reading (1-6)
735 Seminar in Russian Literature (3)
800 Thesis (6)

POLISH (Polsh)
419-420 Topics in Polish Literature and Culture (3-3)

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

CURRICULUM AND INSTRUCTION (Ed CI)
640 Seminar in Teaching Fields (3)

Secondary Education

Graduate Faculty
R. S. Alm, Ph.D. (Chairman)—English education, reading
M. C. Austin, Ed.D.—reading
A. Becker, Ed.D.—art education
F. B. Brown, Ed.D.—secondary education, curriculum
E. F. Chui, Ph.D.—health and physical education
J. N. Fultz, Ed.D.—social studies education
A. W. S. In, Ph.D.—secondary education
G. S. Krahenbuhl, Ed.D.—health and physical education
J. R. Little, Ph.D.—health and physical education
R. M. Martin, Ph.D.—secondary education, supervision, curriculum
S. L. Martin, Ph.D.—health and physical education
D. M. G. McGinty, Ed.D.—home economics education
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.—health and physical education
N. Whitman, Ph.D.—mathematics education
L. F. H. Zane, Ph.D.—trades and industries education

Admission to candidacy is based upon (1) the quality of the student’s graduate course work; (2) his performance on the general examination.

Both Plan A (thesis) and Plan B (nonthesis) are available.

Plan A. The program requires a minimum of 30 semester credits of course work with a minimum of 12 semester credits in education. Required courses are Ed CI 635, 636, or 657, 640*, Ed EP 608, and an elective in another area of education. At least one graduate seminar is required. A maximum of 12 semester credits is to be taken in a related field; usually this field will be the same as the student’s undergraduate major but it may be in reading or in one of the other departments in the College of Education. A maximum of 6 credits is allowed for the thesis (Ed CI 800). The program is primarily designed for those students with an interest in research.

Plan B. The program requires a minimum of 30 semester credits in course work, with a minimum of 12 credits in education. Required courses are Ed CI 635, 636, or 657, 640*, 733, and an elective in another area of education. A minimum of 12 credits is to be taken in a related field. The program is primarily designed to enable teachers to strengthen their teaching field majors. Thus, the related field is usually the same as the student’s undergraduate major. It may, however, be in reading or in one of the other departments of the College of Education. In Plan B, students write a Plan B paper.

CURRICULUM AND INSTRUCTION (Ed CI)
433 Seminar in Interdisciplinary Science Curriculum (3)
437 Curriculum Development, Industrial Education (2)
458 Foundations of Vocational Education (2)
459 Business Education Curriculum (3)
460 Distributive Education (3)
471 Special Problems in Home Economics Education (2)
634 Extraclass Activities in Secondary Schools (2)
635 Middle School Curriculum (3)
636 Secondary School Curriculum (3)
637 Art in Secondary Education (3)
639 Business Education Curriculum (3)
640 Seminar in Business Education (3)
640c Seminar in English (3)
640d Seminar in Foreign Language (3)
640e Seminar in Health and Physical (3)
640f Seminar in Home Economics (3)
640g Seminar in Industrial (3)
640h Seminar in Mathematics (3)
640i Seminar in Reading (3)
640j Seminar in Science (3)
640k Seminar in Social Studies (3)
640l Seminar in Speech (3)
640m Seminar in Interdisciplinary (3)
640n Seminar in Art (3)
640o Seminar in Creative Expression (3)
643 Public School Curriculum for Physical Education (3)
646 Reading Difficulties (3)
647 Clinical Procedures in Reading (3)
649 Theory and Practice in Cooperative Business Education (3)
657 Community College (3)
688 Issues and Trends in Curriculum (3)
699 Directed Reading and/or Research (v)
733 Seminar in Curriculum, Secondary Schools (3)
737 Foundations in Art Education (3)
800 Thesis Research (v)

*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)
J. Fischer, D.S.W.—human behavior
J. Krisberg, M.A.S.A.—practice
K. Kumabe, M.S.W.—casework, research
O. Kurren, Ph.D.—community organization
L. Lister, D.S.W.—human behavior
F. Merritt, D.S.W.—social work practice, research
B. Polemis, Ph.D.—research
W. A. Walsh, Ph.D.—casework

The School of Social Work offers an accredited two-year M.S.W. program. Inquiries for information and applications for admission should be sent to the office of the School of Social Work. The school publishes an annual bulletin.

Admission will be considered for the fall semester only.

The curriculum for the master of social work requires the student to complete a minimum of 52 credits of work including at least 6 credits (600 clock hours) in supervised field work and 6 credits covering research on a group project or individual thesis. The core curriculum, aside from the research sequence, covers three areas: social policy and social services, human behavior and the social environment, and social work practice. The courses in these areas are set up as sequences which continue throughout the two years. The student’s program usually includes the following courses:

SOCIAL WORK (SW)

Social Services

627-628 Policies and Services in World Social Welfare (2-2)
655-B Futuristic Considerations in Social Work (3) I
655-C The Field of Mental Health (3) I
656 Selected Topics in Social Welfare (3-3) II
656-B Social Welfare Change Through Legislation (3) II
656-C Problems in Human Sexuality & Reproduction (3-3) I, II
755-B Social Work Practice with Sex Related Problems (3-3) I, II
755-D Family Planning and Family Life (3) I
755-E Experiential Training in Human Relationships (3-3) I, II & SS
755-F Issues and Theories in Casework and Psychotherapy (3) I
755-G Advocacy, Theory and Practice (3)
756-B Seminar in Family Planning and Family Life (3) II
756-C Behavior Modification with Children (3) II
756-D Social Deviance and Social Welfare (3) II
777-778 Planning, Policy-Making and Administration in Social Welfare (2-2)

Human Behavior in the Social Environment

610-611 Human Development and Behavior in Cross-Cultural Perspective (2-2)
774-775 Studies in Individual and Social Behavior (3-3)

Social Work Practice

(All methods courses require concurrent field practice)

603-604 General Social Work Practice (3-3)
605-606 Social Work Practice with Individuals & Groups (3-3)
607-608 Social Work Practice in Community Organization (3-3)
620-621 Integration Seminar (1-1)
626 Prevention and Treatment of Juvenile Delinquency (2)
660-661 Practicum (3-3)
703-704 General Social Work Practice (2-2)
720-721 Integration Seminar (1-1)
760-761 Practicum (3-3)
764 The Social Caseworker and the Use of Group in Treatment (2)
765 Advanced Social Casework (2)
766 Seminar in Social Casework (2)
767 Casework with Children (2)
770 Advanced Social Group Work (2)
771 Seminar in Social Group Work (2)
781-782 Seminar in Community Organization Process (2-2)
785 Methods of Supervision in Social Work (2)
796-797 Directed Individual Study in Substantive Field (v-v)

Research

651 Introduction to Scientific Method and Research Principles in Social Work (2)
652 Research Methodology in Social Welfare and Social Work (2)
794-795 Group Research Project (3-3)

Sociology

Graduate Faculty

E. Babbie, Ph.D.—methodology, sociology of religion
H. V. Ball, Ph.D.—sociology of law, race relations
H. R. Barringer, Ph.D.—comparative sociology, logic of social inquiry
M. Bloombaum, Ph.D.—methodological integration, social interaction
D. B. Chandler, Ph.D.—family, theory
R. Cheng, Ph.D.—social change, sociology of revolutions
L. J. Cho, Ph.D.—demography
C. Endo, Ph.D.—social stratification, methodology
L. Freeman, Ph.D.—mathematical sociology, general theory
G. G. Kassebaum, Ph.D.—criminology, comparative research
M. K. Maykovich, Ph.D.—methodology, ethnic relations
J. A. Palmore, Ph.D.—demography methodology
R. E. Sakamoto, Ph.D.—urban sociology, social deviance
J. Seldin, Ph.D.—sociology of religion; youth and counter-culture
P. G. Steinhoff, Ph.D.—Japanese society, sociology of law
D. Swift, Ph.D.—sociology of education, formal organizations
E. Volkart, Ph.D.—social psychology, medical sociology
M. G. Weinstein, Ph.D.—sociology of education, sociology of communities
G. Won, Ph.D.—industrial sociology, urban sociology
G. K. Yamamoto, M.A.—occupations and professions, comparative institutions—Japan
D. S. Yamamura, Ph.D.—ecology and demography, methodology
S. Yeh, Ph.D.—urban studies and demography

Two programs of graduate study in sociology are offered: a Ph.D. program that is intended to provide the broadest scholarly basis for research and university teaching, and a M.A. program in applied sociology that affords particular
relevance to one or more lines of professional work other than university scholarship. Applicants for graduate study in the department are required to specify which program they wish to enter.

Admissions will be considered for the fall semester only.

Ph.D.

The Ph.D. program represents an attempt to provide a flexible, professionally oriented and student-centered curriculum. Its goal is the facilitation of interaction among and between students and faculty in a setting that will enhance the opportunity for all to play professional roles.

Beginning graduate students will fulfill all requirements for their first year of study by producing a research paper that shows promise of professional quality work. It is intended that this paper be prepared on a subject and in a style that is chosen by the student with the advice of a committee consisting of two members of the graduate faculty (one of whom may be outside sociology) and one or more advanced graduate students. It may be prepared and submitted at any time after the end of the first academic term and before the end of the second academic term of the student's residence. When this paper is submitted it is reviewed by the committee and all other interested students and faculty members. Their review will serve as a guide for the student's further work.

After completion of the first paper and its review process each student must establish a new committee consisting of at least three members of the graduate faculty (two of whom must be from sociology and one of whom must be from outside sociology). With the help of this committee, the student must prepare a second, professional quality paper. This paper may be presented at any time between the end of the first term and the end of the third term following successful completion of the preliminary paper. This paper, like the earlier one, may mobilize any style of sociological work and cover any substantive area agreeable to a student and his committee. The student's committee members will report to the departmental graduate committee, which will be responsible for certifying successful completion of the M.A. degree requirements to the Graduate Division when a minimum of 30 semester hours of course work and an acceptable paper have been completed.

After successful completion of the master's level paper, students will, upon recommendation of the graduate committee, be admitted to formal candidacy for the Ph.D. degree. Each student will be expected to pass an oral comprehensive examination, conducted by his second paper committee plus two additional graduate faculty members. The departmental graduate committee must certify successful completion of this examination, after which the student will be expected to prepare a dissertation prospectus, a dissertation and an oral defense. Completion of these requirements to the satisfaction of the dissertation committee will result in the recommendation that a degree be awarded. For general requirements for the degree of doctor of philosophy see "Academic Information" section of this catalog.

Students who have completed some graduate work elsewhere (including the M.A.) may submit their earlier work in lieu of their first or second papers at the discretion of their committee. All transfer students must submit a second paper and take the oral comprehensive before proceeding to the dissertation prospectus. In such cases, the usual committee reviews will be conducted in order to certify progress.

M.A.

The M.A. program in applied sociology is designed to provide education in sociological methods and information of particular relevance to several areas of nonacademic employment. This is a program for students who seek specific intellectual development to qualify them for a professional position or to upgrade a position already held. It is possible in this program to focus on the acquisition of the special skills needed to perform effectively as a sociologist in particular private or governmental agencies or organizations such as welfare agencies, corrections institutions, citizens groups, courts, mental hospitals, planning agencies and the like.

The following requirements must be met to receive the M.A. degree in applied sociology:

a) Each applicant must complete a specialized course studies designed by a faculty committee of the department with his particular needs and interests in mind.

b) Each student must complete 30 credit hours of course work, of which at least 18 are courses numbered 600 or above, in a manner acceptable to the student's committee.

c) The committee will evaluate the performance and accomplishments of the candidate by examination; a written thesis is not required.

Initially, the M.A. in applied sociology will permit concentration on any of the following special topics: Social Research Technology, Urban Planning, Population Studies, Deviance and Control, Social Change in Developing Areas, and Teaching of Sociology. Details may be obtained by inquiry to the department of sociology.

SOCIOLoGY (Soc)

412 Analysis in Demography and Ecology (3)
422 Analysis in Social Organization and Change (3)
432 Analysis in Social Control (3)
442 Analysis in Social Psychology (3)
452 Analysis in Social Institutions (3)
462 Analysis in Applied Sociology (3)
472 Analysis in Sociology: Theory, Methods, Statistics (3)
495 Topics in Sociology: Faculty Projects Normally Limited to 10 students (v)
496 Topics in Sociology: Student Projects (v)
620 Proseminar I: The Sociological Profession (3)
621 Proseminar II: The Field of Sociology (3)
714 Seminar in Methods of Research (3)
715 Seminar in Social Statistics (3)
716 Seminar in Theory Construction (3)
720 Seminar in Social Organization (3)
721 Seminar in Social Institutions (3)
722 Seminar in Group Relations (3)
730 Seminar in Social Disorganization (3)
731 Seminar in Social Change (3)
732 Seminar in Comparative Sociology (3)
740 Seminar in Social Psychology (3)
741 Seminar in Culture and Communication (3)
750 Seminar in Demography and Human Ecology (3)
751 Seminar in Urban and Rural Sociology (3)
799 Directed Research (v)
800 Thesis Research (v)
Spanish

Graduate Faculty

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.—phonetics, methodology, and dialectology
E. C. Knowlton, Ph. D.—history of the language, Hispanic-Philippine literature
M. Montes, Ph. D.—Spanish literature, stylistics, creative writing
Y. Montes, Ph. D.—Golden Age and modern Spanish literature
R. Moody, Ph. D.—applied Hispanic linguistics and Ibero-American literatures
J. Roldan, Ph. D.—peninsular Spanish language and literature

Intended candidates for the M.A. in Spanish must present 24 semester hours of undergraduate credit in Spanish beyond the intermediate level, including work in Spanish phonetics, and a year course in Hispanic culture and civilization, or equivalent preparation. Some knowledge of Latin is desirable but not required.

Both Plan A (thesis) and Plan B (nonthesis) are available. Three fields of specialization are offered: Peninsular Literature, Spanish American Literature, and Spanish Language and Linguistics. Under each, a minimum of 30 credit hours are required, including at least 18 credits earned in courses numbered 600-700 and at least one graduate seminar. These 30 credit hours must include:

1. At least 12 credits in one of the three fields of specialization.
2. 450, The Structure of Spanish (unless taken as an undergraduate).
3. 625, Stylistics and Advanced Composition.
4. At least one additional non-required course from each of the two fields not elected for specialization.

There is, in addition, a minimum reading list for each field.

Examinations

1. A satisfactory score is required on the four skills tests of the MLA-ETS Proficiency Examination for Teachers and Advanced Students. These tests may be taken either before or after beginning studies at the University of Hawaii.
2. Written and oral examination on the field of specialization and its corresponding reading list.

SPANISH (Span)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>403-404</td>
<td>Advanced Oral Practice</td>
<td>3-3</td>
</tr>
<tr>
<td>405</td>
<td>Spanish-English Translation</td>
<td>(3)</td>
</tr>
<tr>
<td>441</td>
<td>History of the Spanish Language</td>
<td>(3)</td>
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<tr>
<td>444</td>
<td>Spanish Dialectology</td>
<td>(3)</td>
</tr>
<tr>
<td>450</td>
<td>Structure of Spanish</td>
<td>(3)</td>
</tr>
<tr>
<td>465-466</td>
<td>Modern and Contemporary Spanish Literature</td>
<td>(3-3)</td>
</tr>
<tr>
<td>470</td>
<td>Social and Political Ideas of 20th Century Latin America</td>
<td>(3)</td>
</tr>
<tr>
<td>481</td>
<td>Spanish American Short Story and Theater</td>
<td>(3)</td>
</tr>
<tr>
<td>482</td>
<td>Introduction to the Spanish American Novel</td>
<td>(3)</td>
</tr>
<tr>
<td>484</td>
<td>Introduction to Spanish American Poetry</td>
<td>(3)</td>
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<tr>
<td>490</td>
<td>Hispano-Philippine Literature</td>
<td>(2)</td>
</tr>
<tr>
<td>625</td>
<td>Stylistics and Advanced Composition</td>
<td>(3)</td>
</tr>
<tr>
<td>630</td>
<td>Topics in Spanish Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>658</td>
<td>Seminar in Spanish Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>665</td>
<td>Spanish Literature Prior to the Golden Age</td>
<td>(3)</td>
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<tr>
<td>670</td>
<td>Spanish Literature of the Golden Age</td>
<td>(3)</td>
</tr>
<tr>
<td>671</td>
<td>18th and 19th Century Spanish Literature</td>
<td>(3)</td>
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<tr>
<td>673</td>
<td>20th Century Spanish Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>674</td>
<td>Spanish-American Lyric Poetry</td>
<td>(3)</td>
</tr>
<tr>
<td>682</td>
<td>20th Century Spanish American Novel</td>
<td>(3)</td>
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<tr>
<td>684</td>
<td>Spanish American Lyric Poetry</td>
<td>(3)</td>
</tr>
<tr>
<td>686</td>
<td>16th and 19th Century Spanish American Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>695</td>
<td>Seminar in Hispanic Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research</td>
<td>(v)</td>
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<tr>
<td>800</td>
<td>Thesis Research</td>
<td>(v)</td>
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</tbody>
</table>

EUROPEAN LANGUAGES (EL)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>620</td>
<td>Seminar: Topics in Language and Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>630</td>
<td>Seminar in Research Methods</td>
<td>(v)</td>
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</tbody>
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CURRICULUM AND INSTRUCTION (Ed CI)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>640</td>
<td>Seminar in Teaching Fields: Foreign Language</td>
<td>(3)</td>
</tr>
</tbody>
</table>
Speech-Communication

Graduate Faculty

H. W. Ellingsworth, Ph.D. (Chairman)—interpersonal communication, communication and innovation, history of research
E. J. Billsborrow, Ph.D.—interpretation, public speaking, speech education, semantics
L. N. Breneman, M.A.—interpretation
B. H. Byers, Ed.D.—speech education
J. W. Bystrom, Ph.D.—history of research, communication systems
G. Dykstra, Ph.D.—language performance theory, first and second language development, theory and practice in learning programs
L. E. Ekroth, Ph.D.—intercultural communication, non-verbal communication, encounter groups
L. S. Harms, Ph.D.—intercultural speech-communication, communication systems
P. J. Heinberg, Ph.D.—speech-communication behavior modification, scientific methods
D. W. Klopf, Ph.D.—forensics, debate, small group communication
V. K. Larson, M.A.—speech education, speech improvement, choral speaking
R. L. Rider, Ph.D.—radio and television, international communications
F. Z. Rosario, Ph.D.—intercultural communication, developmental communication
S. E. Sanderson, Ph.D.—contemporary rhetoric, interpretation, international speech education
T. A. Welden, Ph.D.—interpersonal communication, speech education, philosophy of science
H. H. Wong, Ph.D.—phonology, linguistics

Intended candidates for the M.A. in speech-communication may present a bachelor’s degree from a recognized university with a major in a field which involves the systematic study of human communication, including speech, communications, psychology, sociology, business administration, linguistics, education. The aptitude test of the Graduate Record Examination is required. Applicants with satisfactory aptitude are accepted. Plan A (thesis) and Plan B (nonthesis) are available. Both programs require the completion of 44 semester credits in courses numbered above 600. At least 12 semester hours must be in courses numbered above 600. Not more than 2 semester hours may be taken in directed research, SpCom 799. Under Plan B, at least 18 semester hours must be in courses numbered above 600.

Speech Pathology and Audiology

Graduate Faculty

M. Ansberry, Ph.D. (Chairman)—audiology
S. Batkin, M.D.—speech science
D. D. Craven, M.A.—speech pathology, audiology
D. F. McPherson, Ph.D.—speech pathology, audiology
G. Pang-Ching, Ph.D.—audiology
J. R. Watson, M.D.—audiology, hearing science

Intended candidates for the M.S. degree in speech pathology and audiology must present a minimum of 30 undergraduate semester credits in the area including basic courses in speech correction, methodology, pathology of speech, audiology, testing of hearing, habilitation and rehabilitation of hearing, speech and hearing science, and practicum in both speech pathology and audiology. A minimum of 12 credits in psychology including courses in statistics and psychology of adjustment is required.

A preliminary conference will be held with each beginning graduate student prior to his initial enrollment in courses. This will include a thorough analysis of his previous academic programs and a determination of his qualifications for admission to candidacy or the necessity for removal of undergraduate deficiencies without graduate credit before such a recommendation is made. The student’s advisor will determine when recommendation for admission to candidacy will be made. No general examination will be required.

Two programs are offered for graduate study: Plan A, thesis; and Plan B, nonthesis. The plan to be followed is determined by the student and his advisory committee. The decision is based upon specific interests of the student and his future educational and occupational objectives. These programs are so designed that the student who completes either shall be able to meet the academic requirements for the certificate of clinical competence in both speech pathology and audiology as established by the American Speech and Hearing Association. This presupposes a strong undergraduate major and preparation in the areas listed above. Under Plan A 36 semester credits in course work plus a thesis (8 credits) and a final oral examination on the thesis subject are required. Plan B requires satisfactory completion of 44 semester credits of course work including SPA 799 and a seminar appearance in which the student will be examined upon the research study which he has completed.
in this course. The minimum length of time required for completion of either program by a regular graduate student who is admitted with no undergraduate deficiencies is three semesters plus one six-week summer term or equivalent.

Specialized courses offered at the graduate level are:

**SPEECH PATHOLOGY AND AUDIOLOGY (SPA)**

- 600 Research Methods (3)
- 602 Diagnostic Procedures in Speech Pathology (3)
- 603 Advanced Audiology (3)
- 610 Organic Disorders of Speech (3)
- 612 Functional Disorders of Speech (3)
- 613 Language Development for Children with Hearing Deficiencies (3)

**URBAN PLANNING AND RESEARCH (URP)**

- 600 Introduction to Planning Systems (3)
- 602 Methods of Planning Analysis (3)
- 601 Contemporary Planning Theory (3)
- 603 Advanced Audiology (3)
- 610 Organic Disorders of Speech (3)
- 612 Functional Disorders of Speech (3)
- 613 Language Development for Children with Hearing Deficiencies (3)

**SPEECH PATHOLOGY AND AUDIOLOGY (SPA)**

- 670 Advanced Practicum in Speech Pathology (1-3)
- 671 Advanced Practicum in Audiology (1-3)
- 672 Diagnostic Procedures in Speech Pathology (6)
- 673 Seminar in Functional Disorders of Speech (3)
- 721 Seminar in Audiology—Diagnostic Procedures (3)
- 722 Seminar in Organic Disorders of Speech (3)
- 723 Seminar in Audiology—Rehabilitative Procedures (3)
- 799 Research (Required for Plan B Program)
  - Section 1: Speech Pathology (1-4)
  - Section 2: Audiology (1-4)
- 800 Thesis Research (Required for Plan A Program)
  - Section 1: Speech Pathology (8)
  - Section 2: Audiology (8)

94 Urban and Regional Planning

**Graduate Faculty**

- T. Dinell, M.P.A. (Director)—community participation, politics, urban and regional planning, planning theory
- J. Holmstrom, Ph.D.—urban and regional planning, urban economics, planning analysis, development planning
- D. Povey, M.R.P., Ph.D.—urban and regional planning, planning and politics, urban and regional systems

**Cooperating Faculty**

- L. Minerbi, Dott.Arch., M.U.P.—urban-regional design and planning (architecture)
- L. Nitz, Ph.D.—decision making (political science)
- P. Schwend, Ph.D.—urban and regional systems analysis and planning (geography)
- S. Yeh, Ph.D.—urban sociology, housing development planning (sociology)

The Pacific Urban Studies and Planning Program is a multidisciplinary program located in the College of Arts and Sciences. Together with the participating academic departments and professional schools of architecture, economics, engineering, geography, political science, public health, social work and sociology, the planning program offers graduate course work leading to a certificate in planning studies or a master's degree in urban and regional planning.

The program sponsors and facilitates problem-oriented research on urban and regional planning problems, particularly those relevant to Hawaii, the Pacific Basin, Asia and the mainland, and participates in, coordinates with and supports related University efforts.

The Planning Certificate is designed for students who are pursuing a master's degree with one of the participating academic units. The certificate provides students an opportunity to become acquainted with the professional skills and activity of the urban and regional planner. Study programs are individually arranged in consultation with advisers in the participating units. Students are required to take course work in planning theory, planning methods and participate in the planning practicum, a two semester sequence in which students engage in a cooperative planning project. Successful completion of the program leads to a master's degree in the student's chosen field and a certificate in planning studies. Consideration for admission to the certificate program includes:

1. acceptance to one of the affiliated master's degree programs;
2. an interview with the program faculty;
3. filing of planning certificate application materials at least one month prior to the beginning of the fall semester.

The Master's degree in Urban and Regional Planning is designed to provide students with the necessary background training and experience for entry into the urban and regional planning profession. Focusing on a two year course of study, the MURP degree encourages individually arranged study programs in consultation with the program faculty. Program options offer specialization in the following areas:

1. Urban and Regional Systems Planning
2. Public Policy Planning
3. Development Planning

The minimum number of credits for the degree is 36. All degree candidates are required to take:

1. Contemporary Planning Theory (Plan 600, 3 credits)
2. Introduction to Planning Systems (Plan 601, 3 credits)
3. Planning Practicum (Plan 695-696, 6 credits)
4. Directed Reading and Research or Thesis Research (Plan 799, 800, 3-6 credits)

**Entry Requirements for Master’s Degree**

1. An undergraduate degree in a planning or planning related field from an accredited college or university:
2. admission to the Graduate Division:
3. applicants must submit to the program:
   a) 2 letters of recommendation
   b) a 1 to 2 page statement on why they wish to pursue this degree at the University of Hawaii
   c) a candidate assessment form.

Where possible interviews with program faculty will be arranged.

For further information regarding the planning certificate or the master’s degree program students should write to: Director, Pacific Urban Studies and Planning Program, 354 Spalding, 2540 Maile Way, University of Hawaii, Honolulu, Hawaii 96822.

**PLANNING (Plan)**

- 310 Planning Perspectives (3) I, II
- 600 Contemporary Planning Theory (3) I
- 601 Introduction to Planning Systems (3) I
- 602 Methods of Planning Analysis (3) II
- 645-646 Development Planning (3-3) Yr
- 695 Planning Practicum I (3) I, II
- 696 Planning Practicum II (3) I, II
- 780 Selected Topics in Planning (3) I, II
- 799 Directed Reading and Research (v) I, II
- 800 Thesis Research (v) I, II
Zoology

Graduate Faculty

F. I. Kamemoto, Ph.D. (Chairman)—comparative endocrinology
G. A. Ahearn, Ph.D.—invertebrate and environmental physiology
J. M. Arnold, Ph.D.—developmental biology
J. H. Bailey-Brock, Ph.D.—invertebrate zoology
A. H. Banner, Ph.D.—invertebrate zoology, systematics
J. E. Bardach, Ph.D.—sensory physiology, behavior, ecology
A. J. Berger, Ph.D.—ornithology, human and avian anatomy
I. M. Cooke, Ph.D.—cellular neurophysiology, neurosecretion
M. G. Hadfield, Ph.D.—developmental biology of invertebrates
S. R. Haley, Ph.D.—invertebrate embryology
P. Helfrich, Ph.D.—ichthyology, ecology
R. E. Kane, Ph.D.—cell biology
E. A. Kay, Ph.D.—malacology
A. Kinzie III, Ph.D.—coral reef biology, marine ecology
G. S. Losey, Jr., Ph.D.—marine ecology, behavior
J. A. Maciolek, Ph.D.—limnology, fishery biology
R. C. May, Ph.D.—aquaculture; fish development
A. N. Popper, Ph.D.—sensory processes of animal communication
S. A. Reed, Ph.D.—coral physiology
E. S. Reese, Ph.D.—behavior, ecology, invertebrate zoology
E. D. Stevens, Ph.D.—physiology
J. S. Stimson, Ph.D.—population ecology, marine ecology
A. L. Tester, Ph.D.—fishery biology, biometry
S. J. Townsley, Ph.D.—invertebrate zoology, ecology, radiobiology
P. B. van Weel, Ph.D.—physiology, physiological ecology

Affiliate Faculty

E. C. Evans III, Ph.D.—cetacean sonar systems
G. W. Harvey, Ph.D.—cetacean sound production and reception; air-sea interface analysis
F. J. Hester, Ph.D.—fishery biology
J. I. Kendall, Ph.D.—histology
J. E. Randall, Ph.D.—ichthyology
M. Takata, M.S.—fishery biology
L. R. Taylor, Ph.D.—ichthyology
A. C. Ziegler, Ph.D.—vertebrate zoology

Intended candidates for the M.S. or Ph.D. degrees 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, and have completed two years of chemistry (inorganic and organic), one year of physics and courses in calculus and botany. Deficiencies in undergraduate preparation must be made up without graduate credit. An official record of the student’s performance of the Graduate Record Examination (aptitude test and the advanced test in biology) must be submitted to the chairman of the zoology program before any action will be taken on applications for admission.

Zoology courses listed below receive graduate credit if not taken to satisfy undergraduate deficiencies. One seminar or topics course each year is required. 702 and 800 are required only for Ph.D. candidates. For the M.S. under Plan A a maximum of 6 hours, and under Plan B a minimum of 6 hours, may be elected from related courses in botany, chemistry, entomology, genetics, mathematics, meteorology, oceanography, physics, psychology and other related areas. For the Ph.D., additional work will be stipulated by the supervising committees. Ph.D. candidates must pass a reading examination in one foreign language.

Ultimately, it is the responsibility of the student to be aware of the requirements of the program in which she or he is enrolled. This information is available in the catalog and departmental memoranda. Following familiarization with the requirements, the student should consult the faculty adviser.

ZOOLOGY (Zool)

411 Zoology of the Lower Invertebrates (4)
412 Zoology of the Higher Invertebrates (4)
416 Histology (3)
417 Microtechnique (3)
420 Embryology (4)
421 Developmental Biology (3)
430 Animal Physiology (4)
435 Endocrinology (2)
439 Animal Ecology (3)
440 Laboratory in Animal Ecology (1)
441 History of Zoology (2)
450 Natural History of the Hawaiian Islands (2)
460 Avian Biology (3)
465 General Ichthyology (3)
470 Limnology (3)
480 Animal Evolution (3)
485 Biogeography (3)
497 Comparative Physiology (3)
498 Comparative Physiology Lab (2)
504 Comparative Endocrinology (3)
505 Comparative Endocrinology Laboratory (1)
506 Principles of Animal Behavior (2)
507 Principles of Animal Behavior Laboratory (1)
508 Growth and Form (4)
509 Biology of Symbiosis (3)
510 Topics in Developmental Biology (v)
519 Seminar in Teaching (1)
520 Marine Ecology (3)
522 Isotopic Tracers in Biology (3)
531 Biometry (3)
532 Advanced Biometry (3)
542 Cellular Neurophysiology (3)
566 Advanced Ichthyology (3)
591 Seminar in Zoology (1)
599 Directed Research (v)
702 Preparation of Scientific Manuscripts (1)
714 Topics in Animal Behavior (v)
715 Topics in Invertebrate Zoology (3)
716 Topics in Fish and Fisheries Biology (3)
718 Topics in Animal Physiology (3)
800 Thesis Research (v)
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