The attached annual report speaks for itself; I hope you will find it informative.

By way of giving alumni a first-hand look at the changing Manoa campus, the students this year have planned a Homecoming Open House on November 20. There will be tours of the campus and a variety of displays and exhibits by University departments. Details of the event will shortly be in the local newspapers; we hope you will watch for the announcements, and that you will plan to join us that day.

Sincerely,

Thomas H. Hamilton
President
University of Hawaii
My distaste for writing annual reports is reasonably well-known. Not that I don't welcome the opportunity to talk about the University of Hawaii; there are some people who wish that I would talk about something else for a change. But with any institution as complex and strange as a university, as dynamic and explosive in some ways and as interminably slow and long-range in others, one year is not a long enough period of time in its history to give a balanced picture of its operation.

By way of combating this problem, I thought I would start my report this year with a discussion about a subject of continuing, rather than annual interest: Money. Where does the University get it, and how is it spent?

Part of the difficulty in understanding a university's budget comes from the fact that few citizens have the time to analyze the matter carefully. In addition, at the risk of offending some of my friends, I must note that financial reports are not, shall we say, always as clear as they should be.

I shall try for clarity, realizing that there are those among you who are saying at this point, "He is a bigger fool that I thought!"
The operating income for the University of Hawaii in the year ending June 30, 1965, was $33,176,885. The accompanying chart shows where the money came from.

INCOME
(figures in millions of dollars)

As the figures show, half of our operating funds during the year was provided by the State of Hawaii. Of this $16.5 million total, a little more than $13 million represents money appropriated from tax dollars.

The other $3.5 million includes more than $2 million in receipts from tuition and fees, plus funds from a variety of smaller sources. This might be termed "the University's money," in that it is paid into the State general fund with the informal understanding that it will return to the University as appropriated revenue.

I doubt that most citizens are aware that the federal government currently provides more than a third of the total University income; last year the figure amounted to $11,892,687. The figure and the per cent have both grown in the last ten years; in 1954-55, federal support totaled $625,000, or 11 per cent of the budget.

Part of the current federal appropriation supports the work of the East-West Center, but there is more than $7 million in the budget for
research and training. This, I feel, is a material recognition of the importance of Hawaii and its university in national education programs.

Auxiliary enterprises brought the University some $2.3 million during the year. The category refers to major University operations which receive funds from the sale of goods or services, such as the bookstore, the dormitories, food service operations, and parking.

The sharp-eyed reader may have noted that the fourth largest source of revenue is from "student fees," despite the fact that I seemed to account for that category a few minutes ago. The fees listed here are those supporting special University programs, including the College of General Studies, the Advanced Management Program, and the summer sessions.

The remaining sources of funds are smaller, but one of them deserves a comment, I think. Gifts and grants from private sources last year accounted for two per cent of the operating income. Most of this money came from relatively few large foundations and corporations, and the major part of it came from the mainland United States.

It is encouraging to note some change in this giving pattern, however. During the year, Hawaii's corporate community began to provide increasing support for the University, and we hope soon to see this material interest grow at the individual level, as well. In a public university, the "margin of greatness" lies in the amount of private support provided to assist the institution. The ultimate excellence of the University of Hawaii is directly related to the amount and per cent of funds that are totaled each year in this category.

Having accounted in some degree for the sources of University funds, the next question is how they are expended. The pie-chart gives a fairly clear picture, I think.
Expenses are divided between educational and non-educational purposes. The bulk of non-educational expenditures are those related to the auxiliary enterprises discussed earlier, and these closely balance the amount received from these operations.

In the area of educational expenditure, the picture is slightly more complex. A total of $32,696,033 was expended last year. Of this amount, $11,200,347, or a little less than 33 per cent, went to instruction, departmental research and related activities. Another $815,353 was used for the support of the library. Organized research activity, largely supported by extramural (mostly federal) funds, totaled $7,542,966.

In the area of service to the Hawaiian and world communities, the work of the Cooperative Extension Service took some $1,049,591, and the East-West Center expended $4,635,950.

It took $1.4 million for administration, student services, and general institutional expenses, and another $1.3 million to operate and maintain the physical plant.

The figures are interesting, I think, because they give the lie to
the complaint that public institutions tend to let the tail wag the dog. It is expensive to operate, service, and maintain a $33,000,000 operation, yes; but the great bulk of the budget -- some $30,000,000 of the total -- goes directly to those functions for which a public university exists -- education, research, and service to the community.

So much for the budget. In reporting on the activities of the year, I can only say, as I have said before, that this has again been a year of change at the University. I think that the significance of some of the changes is readily apparent; for others, we must wait to tell the effect.

Certain phenomena, as always, are observable. We grew some more. Total enrollment in credit courses stood at 14,368 last fall, a 10 per cent increase over the previous year. The number of semester hours of instruction taken by students rose by more than 12 per cent. The faculty increased from 972 state-supported positions in 1964 to 1,187 by January, 1965.

Graduate enrollment continued its upward trend, rising from 1,292 degree candidates a year ago to 1,549. Graduate degrees were awarded to 418 masters and 21 doctors in June -- contrasted with the count just five years ago of 81 masters and 3 doctors.

Summer sessions kept pace with the enrollments of the regular academic year, growing to the point that for the first time in history, the University scheduled afternoon summer classes to meet growing demand.

Complementing this growth in the instructional area, research activities moved ahead in both size and scope. Research grants from all sources, including state, federal, and private grants and contracts totaled more than $8 million, almost doubling the figures of 1963-64. The projects they support range from work on shower tree hybridization to exploratory studies for the drilling of the Mohole.
Several new programs were begun. Eight-five persons, twice the number anticipated, enrolled this summer in the first classes of the Graduate School of Library Studies. The Education Research and Development Center completed staffing and started to work; a new Pacific and Asian Linguistics Institute, a Water Resources Research Center, an Oceanographic Research Laboratory at Kewalo Basin, and a Cloud Physics Laboratory in Hilo were activated.

New faces have appeared, and some of the best of the old have left us. The year brought the retirement of two deans: Virginia Jones of the College of Nursing, and Wilfred J. Holmes of the College of Engineering. Their presence will be sorely missed. Dr. Marjorie S. Dunlap of U.C. L.A. will replace Dean Jones next year, and John W. Shupe of Kansas State University arrived in the fall of 1965 as the new dean of engineering. Another Kansan, C. Peairs Wilson, came to head the College of Tropical Agriculture, and Wytze Gorter from U.C. L.A. took over the deanship of the Graduate Division. Ralph R. Shaw, formerly at Rutgers, filled the new deanship of library activities. Robert B. Brown, a former vice-president of Bristol-Myers, joined the staff of the College of Business Administration as an assistant to Dean Schuyler Hoslett.

There have been some changes in the faces of our campuses. In Manoa, we opened a classroom and office structure named for Ralph S. Kuykendall, the late historian of Hawaii. We re-opened the completely renovated Gartley Hall, which now houses a fine psychological research center. Site preparation for the Graduate Research Library got under way, and various University committees continued work on plans for several other new structures, and for some temporary solutions to the serious space problems that the next few years will bring. In Hilo, we completed a new classroom-laboratory building and started work on the cloud physics laboratory.
The year has witnessed further work toward the implementation of the legislative act authorizing a community college system under the University board of regents.

In the area of programs and curricula, Norman C. Harris of the University of Michigan visited Hawaii to evaluate the existing programs in the state's technical schools and to suggest guidelines for the development of new programs. At least one of these -- a two-year nursing program -- started this year on the Manoa campus and will be moved when feasible to a proper community college operation.

In physical planning, an inventory of existing technical school plants and facilities was made and initial estimates prepared for campus facilities needs.

The present schedule for the colleges calls for the first, on Maui, to commence operation in the fall of 1967. By 1968, three more colleges (Honolulu, Kapiolani, and Leeward Oahu) will be in existence, with another facility projected for Kauai.

Such physical manifestations of growth, however, fail to tell the most important part of the story at the University. For that, one must go into the offices, the classrooms, the conference rooms, and the library.

Here, people diligently and without fanfare have sought solutions viable in our individual campus situation to a problem that is much more universal in scope.

Basically, this is the problem of how to cope with an endlessly increasing body of knowledge. What principles should govern the selection of what and how much to teach? What is relevant to our civilization; and given the continuing growth of knowledge, how long will it stay relevant? How does one prepare a student for a life that is useful and meaningful in a world that has thrown predictability out the window?
The University is approaching the matter from a number of directions:

- On the recommendation of the faculty senate, a committee representing each college, the Hilo campus, and the nascent community colleges is considering what basic educational experience should be universal in all baccalaureate programs. Interim requirements have been established for the coming year, seeking to insure that each student obtains some fundamental knowledge in the humanities, the natural sciences, and the social sciences, as well as in oral and written rhetoric.

- Colleges and departments are scrutinizing course offerings for their continued relevance; last year, as a result, 72 courses were dropped as "out-of-date" or otherwise unnecessary.

- The importance of interdisciplinary study is being recognized and implemented at several levels.

Course additions for next year, for instance, include two based on interdisciplinary synthesis: a multi-faceted look at Man in Society for undergraduates, and The Theory of Administration, a graduate course presented jointly by the colleges of Business Administration and Education, the political science department, and the School of Social Work.

Interdepartmental programs for biology, the social sciences, Asian studies, and written and spoken English are under study, and a new department of oceanography will exemplify the interdisciplinary approach with a curriculum embracing biology, chemistry, physics, geology, and engineering.

At the collegiate level, recommendations were made for the establishment of a new College of Health Sciences, embracing
professional schools of medicine, public health, and nursing. Here teaching programs will work hand-in-hand with research activities of the Pacific Biomedical Research Center.

- Teaching is, most naturally, the primary function of a university; doing it well is an important aspect of our efforts. To make sure that the institution is giving ample attention to this matter, a special faculty committee is seeking ways to identify and reward good teaching. The year also marked the presentation of the first Regents' Award for Excellence -- two in teaching and one in research.

- With the helpful assistance of the state, the University has undertaken a program to strengthen and improve the campus library system. During the year, 29,200 volumes representing 18,250 titles were purchased for the Sinclair Library collections. Some 275 periodicals, including backfiles of varying lengths for most of them, also were added. And the backlog in cataloguing, long a problem of considerable dimension, has been reduced to controllable size. Total bound volumes now number 439,000, with more than a million unbound parts.

A library program particularly concerned with the problem of the meaningful education is one financed by a grant received this year from the Carnegie Corporation. Commencing in the fall of 1965, its objective will be to explore methods by which the library may become a more valuable learning tool for today's undergraduate college student. As one part of the experiment Dr. Houston Peterson, a distinguished scholar and philosopher, will come to the University in February 1966, as a visiting colleague; his assignment will be to maintain an informal,
open-door office where students may come at any time to talk about books and ideas.

- The student body is making a valuable, concrete contribution to relevance with a well-executed series of seminars and symposia that have brought to Hawaii the leading spokesmen in a number of fields. Programs this year presented spectra of political and religious thought as well as several individual speakers of importance; the campus and the community have benefited from the experience.

- By way of keeping myself and staff attuned to the problems which students face in the process of their education, we created in the spring of 1965 "The President's Round Table." Its object will be to provide a forum to discuss problems of common concern to students and the people working with them.

A public university is a strange, wonderful, and confusing institution. It baffles government officials, businessmen, and organization experts who try to analyze it, for it cannot be made to stay on an organization chart in any meaningful way. Its president is in theory responsible only to a board of laymen, but he must also recognize a responsibility to the faculty, the students, the legislature, the governor, the alumni, the citizens, and the relevant parts of many centuries of the university tradition. Then, when one becomes sophisticated enough to recognize this, he must further learn that it is not really important. What is important is what goes on in the classroom, the laboratory, the library, and ultimately the minds of men.

How well is the University of Hawaii doing its job? Rather well, I think, but the answer really will not be available for some twenty years when present students will be the leaders of tomorrow's Hawaii.
### FINANCIAL STATEMENT FOR THE FISCAL YEAR 1964-65

#### INCOME—EXCLUDING PLANT FUNDS

**EDUCATIONAL AND GENERAL:**

<table>
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<tr>
<th>Source</th>
<th>Amount</th>
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<td>Student Fees from Special Programs</td>
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<td>Public Appropriations:</td>
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<td>Federal Funds:</td>
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<tr>
<td>East-West Center</td>
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<td>Other</td>
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<td>State General University Funds</td>
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<td>Gifts from Private Sources</td>
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<td>Sales and Services of Educational Departments</td>
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<td>Other Sources</td>
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<td>Total Educational and General</td>
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**AUXILIARY ENTERPRISES AND PROJECTS:**

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<tr>
<th>Category</th>
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<td>Auxiliary Enterprises</td>
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<td>Projects</td>
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<td>Total Auxiliary Enterprises and Projects</td>
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**Other Income from Non-Educational Sources**

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<th>Amount</th>
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<td>243,716</td>
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**Total Income—Excluding Plant Funds**

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<th>Amount</th>
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<td>$33,176,885</td>
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#### EXPENDITURES—EXCLUDING PLANT IMPROVEMENTS

**FOR EDUCATIONAL PURPOSES:**

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<th>Category</th>
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<th>State</th>
<th>University</th>
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<td>Instruction and Related Activities</td>
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<td>$ 8,982,857</td>
<td>$ 1,192,870</td>
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<td>Organized Research</td>
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<td>2,904,555</td>
<td>759,449</td>
<td>7,542,966</td>
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<td>Cooperative Extension Service</td>
<td>375,488</td>
<td>674,103</td>
<td>1,049,591</td>
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<td>Library</td>
<td>8,100</td>
<td>800,600</td>
<td>6,653</td>
<td>815,353</td>
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<td>Total for Instruction and Research</td>
<td>$ 5,287,170</td>
<td>$13,362,115</td>
<td>$1,958,972</td>
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<td>Administration and General Expense</td>
<td>18,929</td>
<td>1,441,996</td>
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<td>Operation and Maintenance of Physical Plant</td>
<td>1,289,773</td>
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<td>Public Services</td>
<td>6,562,706</td>
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<td>Total Educational Expenditures</td>
<td>$ 6,581,635</td>
<td>$ 3,225,402</td>
<td>$ 61,027</td>
<td>$9,868,064</td>
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**FOR NON-EDUCATIONAL PURPOSES:**

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<tr>
<th>Category</th>
<th>Federal</th>
<th>State</th>
<th>University</th>
<th>Total</th>
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<tbody>
<tr>
<td>Auxiliary Enterprises and Projects</td>
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<td>1,990,335</td>
<td>1,999,670</td>
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<td>Others</td>
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<td>220,042</td>
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<tr>
<td>Total for Non-Educational Expenditures</td>
<td>$ 9,335</td>
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<td>$ 2,210,377</td>
<td>$ 2,219,712</td>
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<tr>
<td>TOTAL UNIVERSITY EXPENDITURES</td>
<td>$11,878,140</td>
<td>$16,587,517</td>
<td>$ 4,230,376</td>
<td>$32,696,033</td>
</tr>
</tbody>
</table>

(The surplus of income over expenditures shown at June 30, 1965, was due to a temporary increase in special fund revenues.)
The President
University of Hawaii
Honolulu, Hawaii 96822

Janet E. Bell
1907 Ventura Drive
Honolulu, Hawaii 96822
Graduate Division

1966-1967
UNIVERSITY OF HAWAII
BULLETIN
APPLICATION FOR ADMISSION FOR

Semester or Term Year

Mr. Mrs. SOCIAL SECURITY NO.

1. Name in full: Miss

(Enter full name; underline family name)

2. Permanent address

Present address Phone No.

3. Place of birth Date of birth Citizenship Visa status (specify)

4. Marital status: Married single divorced number of dependents

5. List your physical handicaps if any

6. Institutions of higher learning attended and any in which you may be enrolled at present:

<table>
<thead>
<tr>
<th>Name of Institution (List chronologically)</th>
<th>Location</th>
<th>Dates (mo. &amp; yr.) From To</th>
<th>Major</th>
<th>Name of Degree or Diploma</th>
<th>Date Rec'd or Expected</th>
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</table>
Should considerable time have elapsed between the bachelor's degree and your subsequent graduate study, please indicate the nature of your activities in this intervening period on a separate sheet (type if possible).

7. I WISH TO APPLY FOR ADMISSION INTO THE DEPARTMENT OF__________________________
   AS A: (1) FULL-TIME____ (2) PART-TIME____ STUDENT WORKING TOWARD THE____ DEGREE.
   (check one)

8. □ I am enclosing two sets of my official transcripts.
   □ I will arrange ________________ to have two sets of my official transcripts of my collegiate academic record sent to you from_______________________________________________.
   □ I have arranged ________________ to have two sets of my official transcripts of my collegiate academic record sent to you from_______________________________________________.

9. Have you applied previously at this institution? If so, please give particulars on a separate sheet.

10. On a separate sheet write (type if possible) a detailed statement of your purposes and general plan of graduate work.

*You will not be admitted to the Graduate Division unless two complete sets of your transcripts are received. Applications in the following fields cannot be processed without GRE scores:
   Educational Psychology, English, Genetics, Physics, Psychology (also MAT scores) and Zoology.

Any student granted permission to enroll in the Graduate Division is subject to the rules and regulations stated in the Graduate Division Bulletin.

Send this application and two sets of official transcripts to
THE DEAN OF THE GRADUATE DIVISION, University of Hawaii
2540 Maile Way, Honolulu, Hawaii 96822

Date______________________________ Signature of Applicant______________________________
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**UNIVERSITY OF HAWAII BULLETIN**

**VOLUME XLV**

February 1966

Number 2

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1966–67 CALENDAR

First Semester

September 6–17, Tuesday through Saturday............................Academic advising, registration, orientation
September 19, Monday..............................................................Instruction begins
September 23, Friday..............................................................Last day of registration for credit
October 7, Friday.................................................................Last day of withdrawal from courses without grade penalty
November 8, Tuesday.............................................................General Election (holiday)
November 10, Thursday..........................................................Deficiency reports due
November 11, Friday..............................................................Veterans’ Day (holiday)
November 23, Wednesday......................................................Last day for removal of “Incompletes”
November 24–26, Thursday through Saturday............................Thanksgiving recess
December 2, Friday...............................................................Last day for withdrawal from courses
December 5–16, Monday through Friday.................................Early registration for second semester
December 17, Saturday............................................................Last day before Christmas recess
January 3, Tuesday.................................................................Instruction resumes
January 14, Saturday..............................................................Last day of instruction, first semester
January 21, Saturday.............................................................First semester ends

Second Semester

February 2–4, Thursday through Saturday..............................Academic advising, registration
February 6, Monday..............................................................Instruction begins
February 10, Friday..............................................................Last day of registration for credit
February 22, Wednesday........................................................Presidents’ Day (holiday)
February 24, Friday..............................................................Last day of withdrawal from courses without grade penalty
March 25, Thursday..............................................................Last day for removal of “Incompletes”
March 24, Friday.................................................................Good Friday (holiday)
March 25–April 1, Saturday through Saturday.........................Easter recess
April 7, Friday..........................................................Deficiency reports due
April 28, Friday...............................................................Last day for withdrawal from courses
May 25, Thursday..............................................................Last day of instruction
May 26, Friday.................................................................Final examinations begin
May 30, Tuesday.................................................................Memorial Day (holiday)
June 2, Friday.................................................................Second semester ends
June 11, Sunday.................................................................Commencement

Summer Session

June 19, Monday.................................................................Registration for first term
July 28, Friday.................................................................First term ends
July 31, Monday.................................................................Registration for second term
September 8, Friday..........................................................Second term ends

1967–68

September 5–16, Tuesday through Saturday.............................Academic advising, registration, orientation
GRADUATE DIVISION STAFF

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

ADMINISTRATIVE OFFICERS

General Administration

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Wytze Gorter, B.A., M.A., Ph.D., Director of Research Administration
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Willard Wilson, B.A., M.A., Ph.D., LL.D., Secretary of the University
Harold M. Bitner, B.A., M.A., Ph.D., Dean of Student Personnel
Shunzo Sakamaki, B.A., M.A., Ph.D., Dean of Summer Session
Ralph R. Shaw, B.A., B.S., M.S., Ph.D., Dean of Library Activities
Kaoru Noda, B.A., M.S., Ph.D., Director of the Hilo Campus

East-West Center

Howard P. Jones, Litt.B., LL.D., Chancellor of the East-West Center
Y. Baron Goto, B.A., Sc.D., Vice-Chancellor, Institute for Technical Interchange
John R. Hendrickson, B.S., M.A., Ph.D., Vice-Chancellor, Institute for Student Interchange
General Information

The University of Hawaii is the principal institution of higher learning in the state of Hawaii. Its aim is to provide high-caliber instruction, research, and service to Hawaii, the nation, and the world community, especially the Pacific Basin.

In carrying out this aim, the University conducts a wide variety of activities. Many of these are similar to those offered by other state universities and land-grant colleges in the U.S. Others are unique, taking special advantage of Hawaii's subtropical mid-Pacific location and its multiracial composition. This is especially true of programs in tropical agriculture, marine biology, biomedicine, geophysics, sociology, linguistics, and cultural and technical interchange among students, scholars, and technicians from Asia, the Pacific, and the Americas.

The main campus is located in the Manoa Valley section of Honolulu, the capital of the state. The University maintains a second campus in Hilo, on the island of Hawaii, where its Peace Corps training facility is also based. Space observatories and associated research facilities of the University are on the islands of Maui and Hawaii. Branches of the Hawaii Agricultural Experiment Station are located on four of the major islands of the state.

The University is a federal land-grant institution, founded in 1907 by the Hawaii Territorial Legislature under the provisions of the Morrill Act of 1862 and subsequent legislation. Originally called the College of Agriculture and Mechanic Arts, the University was given its present name in 1920.

On the main campus also are the buildings of the East-West Center (formally, the Center for Cultural and Technical Interchange between East and West), a project of the federal government operated in association with the University of Hawaii.

Inquiries. Prospective students should address inquiries to the Graduate Division, 2540 Maile Way, Honolulu, Hawaii 96822. Summer Session information may be obtained by writing to the Dean of the Summer Session, Crawford Hall, Room 208, 2550 Campus Road, Honolulu.

RESEARCH AND SERVICE OPERATIONS

In addition to the instructional program, the University conducts organized research in several fields and offers other forms of public service. The most important of these operations are described below.
The Aquarium at Waikiki, which is open to the public, is operated by the University as a place of education and entertainment. It also houses some of the research facilities of the Hawaii Institute of Marine Biology.

The Communications Center offers services to all University staff members interested in using existing audio-visual instructional materials or in creating new materials. Services include creation of maps, projectuals, electronic stencils, photographs, slides, charts, models, mock-ups, filmstrips, motion picture film clips, and television materials; locating and scheduling for classroom use 16 mm films, tape recordings, filmstrips, kinescopes, slide sets, chart sets and equipment, and operators as necessary. Inquiries should be directed to the Communications Center.

The Economic Research Center is designed to promote an understanding of the economy of the state of Hawaii. It evaluates economic effects of legislation and performs basic economic research, particularly statistical research relating to Hawaii. In cooperation with the economics department and the College of Business Administration, the Center offers research training to advanced students.

The Education Research and Development Center adopts an interdisciplinary approach to the conduct of basic and applied research concerned with instructional and administrative problems, curriculum development and evaluation, educational program evaluation, extension of understanding of human learning and development, the analysis and design of educational systems, and advance planning. Cross-cultural research and development to facilitate educational planning and practice in areas of the Pacific Basin and the Far East is a major concern.

The Gregg M. Sinclair Library is the main library of the University. The library’s services and its collections are available to faculty, students, adult off-campus borrowers, and visiting scholars.

The main collection is organized in an open-stack arrangement for maximum ease of access. Two special subject collections are also housed in the Sinclair Library: the extensive Hawaiian and Pacific collection, and the Japan, China, and Korea collections (administered by the East-West Center). Government documents (including United Nations, U.S. Government Printing Office, and some foreign government publications) form a fourth separate collection.

The Sinclair Library’s total collections (exclusive of East-West Center holdings) now number 440,000 bound volumes and about 1,000,000 unbound parts. Over 5,000 serial titles are received, and there are some 18,000 reels of microfilm, 160,000 microcards and microprints, and 38,000 maps.

Other libraries which University students may use include the East-West Center Library (which maintains a rapidly growing collection on
Asia), the Library of Hawaii, the State Archives, and the libraries of the Hawaiian Historical Society, the Hawaiian Mission Children's Society, and of several cooperating institutions.

The Harold L. Lyon Arboretum, covering 124 acres in the upper portion of Manoa Valley, was presented to the University by the Hawaiian Sugar Planters' Association. Several hundred genera of exotic trees and shrubs are established, inventoried, and well maintained, providing the University and the scientific community with an unrivaled facility for research on living tropical and subtropical woody plants.

The Hawaii Institute of Geophysics is organized to take advantage of the unique position of Hawaii as a national laboratory for geophysical research covering the broad field of the earth sciences. A new building now houses the Institute and also provides space for the Statistical and Computing Center. In cooperation with academic departments devoted to the physical sciences, the Institute operates research programs and provides advanced training in meteorology; coastal geology and oceanography including tsunamis; rock, soil, and volcanic gas chemistry and physics; atmospheric, cosmic, and solar physics; geophysics of the earth's crust and mantle, including seismology; and related fields. The Institute also maintains a high-altitude observatory on the summit of Mount Haleakala on Maui, a cloud physics observatory at Hilo, Hawaii, and a seismographic observatory in upper Manoa Valley; plans for an observatory at high elevation on the island of Hawaii are being developed.

The Hawaii Institute of Marine Biology has branches on Coconut Island in Kaneohe Bay and at the Aquarium in Waikiki. It encourages research in the marine biological sciences, including fisheries, by providing facilities and technical services for the faculty, graduate students, and visiting scientists. Its research programs include studies of the life histories, behavior, and identification of marine animals; poisonous and toxic marine animals and plants; fish poisoning; and fundamental research on life processes using marine animals for experimentation.

The Human Relations Area Files is a research organization which collects, organizes, and distributes to 20 participating universities data on selected countries and tribal societies of the world. This material, housed in Sinclair Library, facilitates basic research and comparative studies in human behavior, social life, and culture.

The Industrial Relations Center promotes understanding of personnel and industrial relations. Its library contains information on the basic services in the field, as well as current publications. The Center provides reference service, and assists in conducting conferences, lectures, and group discussions, and in training of advanced students. The Center publishes research studies in basic industrial relations problems, as well as
a monthly *Newsletter*, a bimonthly *Selected Acquisitions List*, reprints, reading materials, and bibliographies.

The **Land Study Bureau** develops, assembles, coordinates, and interprets data on the characteristics and utilization of land throughout the state of Hawaii, to the end that the highest and best use of those lands may be ascertained. The primary program involves land classification of the entire state based on soil types, rainfall and climate, economics, and agricultural technology. Secondarily, the Bureau provides the governor, the legislature, and other state and county agencies with data and impartial advice on land use.

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

The **Office for International Programs** coordinates international programs undertaken by the University in overseas areas. These involve programs in Pakistan, Thailand, the Trust Territories, and the Ryukyuan Islands. The office coordinates specialized training programs designed for American personnel going to the Pacific and Asia. This includes a year-round training program for Peace Corps volunteers going to Asia and the Pacific regions. The office coordinates and advises on contractual matters relating to such international programs.

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 **Pacific Biomedical Research Center** encourages investigations in the areas of subcellular biology, microbiology, cell structure and function, regulatory biology, genetics, behavioral sciences, and epidemiology. 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 human genetics, microbiology, physiology, biochemistry, biophysics, pharmacology, and psychology, in which it fosters and facilitates research projects of biomedical interest.

The **Pacific and Asian Linguistics Institute** plans and conducts research in general theory and specific problems of lexicology, structural semantics, and grammatical description. Through its Pacific Lexicography Center the Research Institute collects and studies data on the
languages of the Pacific and adjacent areas, developing and utilizing computer techniques for storage and retrieval.

The Social Science Research Institute facilitates the initiation of faculty research and develops and conducts programs, primarily interdisciplinary, in the social sciences. It buttresses instruction in appropriate departments by rendering support to research scholars engaged in directing the work of advanced graduate students. A long-term study of social movements in Asia and the Pacific, conducted by the Institute, provides an opportunity for faculty members to participate in field studies and related research in this area.

The Speech and Hearing Clinic, through its staff members and supervised student clinicians, offers diagnostic and therapeutic services for children, University students, and other adults. A registration fee is charged for non-University cases.

The Statistical and Computing Center operates an IBM 7040-1401 system (to which an IBM 360 is being added), along with a supporting line of peripheral punched card equipment. It provides services with respect to statistical consultation, system design, data processing, computing, and educational and reference advice to all the divisions and departments of the University.

The University of Hawaii Press publishes scholarly books, particularly those dealing with Hawaii and the Pacific, and two quarterly journals, Pacific Science and Philosophy East and West.

The Press is a member of the American Association of University Presses; it was established in 1947 as a division of the University operating under the guidance of an advisory committee of seven faculty members appointed by the president. Book manuscripts should be sent to the director, journal papers to the respective editors-in-chief.

The Water Resources Research Center, organized in 1964, plans and conducts research of either a basic or practical nature in relation to Hawaii's water resources, and provides for the training of engineers and scientists through such research. Research is interdisciplinary, involving hydrology and hydraulic engineering, geology, geochemistry, microbiology, public health, climatology, and other related fields. The Center promotes interdisciplinary programs in water resources research among various units of the University.

COOPERATING INSTITUTIONS

Through cooperative agreements with institutions listed below, the University has increased its research facilities and expanded its services to the state. The Bishop Museum, the Pacific and Asian Affairs Council, and the Academy of Arts offer student membership rates.
The Bernice P. Bishop Museum, a world-famous storehouse of information, contains an outstanding reference library as well as important biological and anthropological collections relating to Hawaii and other Pacific islands. In addition, this institution holds the combined herbaria of the University and the museum, the most complete collection of Hawaiian plants in existence. The museum's research facilities are available to University students on a reciprocal basis.

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

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

The Honolulu Academy of Arts, built and endowed by Mrs. Charles M. Cooke, contains valuable collections of both Eastern and Western art. These are available for use by students and instructors.

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

The Pineapple Research Institute of Hawaii, supported by the pineapple industry, is affiliated with the University. Offices and laboratories are in Institute buildings in the campus area. Field studies are carried on at a 150-acre experimental farm in Wahiawa, Oahu.

The Honolulu Biological Laboratory of the U.S. Fish and Wildlife Service has permanent headquarters on the campus. Senior staff members of the Laboratory cooperate with the departments of zoology, genetics, botany, geosciences, and oceanography in offering advanced courses and in directing research in marine biology and oceanography. Several fellowships are available to citizen students. Requests for information or application forms should be addressed to the Director, U.S. Fish and Wildlife Service, Honolulu Biological Laboratory, Box 3830, Honolulu, Hawaii. Also cooperating in the study of marine life is the Hawaii State Division of Fish and Game.

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

The U.S. Geological Survey Volcano Observatory, located at Kilauea Crater on the island of Hawaii, conducts research relating to the Hawaiian volcanoes. Research facilities are made available on occasion to faculty and students of the University.
TUITION AND FEES
(Tuition and fees subject to change)

Tuition and fees for graduate students are the same as for undergraduates. Out-of-state students pay the same tuition and fees as resident students.

Tuition

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

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

College of General Studies and Summer Session. College of General Studies and Summer Session students pay $16.00 per credit hour.

Fees

To be official, all fees must be paid within 24 hours after the close of the final day of registration. Exceptions may be made by the business office only upon written permission of the Dean of the Graduate Division.

General. Full-time students pay a general fee of $18.00 per semester.

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

Diploma fee. All recipients of advanced degrees are required to pay a diploma fee of $5.00.

Thesis Binding fee. The fee is $4.00 to cover the cost of binding two copies of the thesis.

Payment for the diploma and thesis binding fees should be made at the business office. The receipt must then be presented to the Graduate Division.

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

Refunds

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

80% during the first two weeks of instruction.
40% during the third and fourth weeks.
0% after the fourth week.

SCHOLARSHIPS AND FELLOWSHIPS

Teaching Assistantships. The University offers a number of teaching 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 readers or part-time teaching assistants and carry a limited program of study. The initial remuneration is $2,664 payable in twelve monthly installments, and waiver of tuition and fees. The period of service is September 1 to June 15. Applications should be addressed to the Dean of the Graduate Division and should be filed before March 1. Each application must be accompanied by a transcript of academic record (two complete sets) and three letters of recommendation from professors of his major courses.

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

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

East-West Center Scholarships. See pp. 15 to 18 for details.

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

- Castle and Cooke Grant
  - Mr. H. Roy McArdle
  - University Placement Officer

- Danforth Graduate Fellowships
  - Prof. William Huntsberry
  - Department of English

- Danforth Teacher Grants
  - Dr. Pressley C. McCoy, Assoc. Dir.
  - Danforth Foundation
  - 607 North Grand Boulevard
  - St. Louis 3, Missouri

- NASA Predoctoral Research Training Program
  - Dean of the Graduate Division
  - University of Hawaii

- National Defense Education Act Graduate Fellowship Program
  - Department Chairman
  - University of Hawaii

- National Science Foundation Academic Year Institutes
  - Dr. Michael Frodyma
  - Department of Chemistry

- National Science Foundation Graduate Traineeships
  - Dean of the Graduate Division
  - University of Hawaii
GENERAL INFORMATION

Public Health Service Predoctoral Fellowships
Chief, Career Development Review Branch, Div. of Research Grants National Institute of Health Bethesda, Maryland 20014

Public Health Service Traineeships
Dean, School of Public Health University of Hawaii

Woodrow Wilson Dissertation Fellowships
Dr. Donald Johnson University of Hawaii

Woodrow Wilson National Fellowships
Dr. Donald Johnson University of Hawaii

National Defense Modern Foreign Language Graduate Fellowships
Prof. Yukuo Uyehara University of Hawaii

Bernice P. Bishop Museum Fellowships
Chairman, Department of Entomology University of Hawaii

Fulbright-Hays Travel Grants
Dean of the Graduate Division University of Hawaii

LIVING ACCOMMODATIONS AND EXPENSES

Admission to the University is made without reference to the availability of housing. Requests for residence hall accommodations should be made directly to the Student Housing office. The halls are operated on the American plan. The contract is for the entire academic year or remainder thereof and is for room and board (10 meals per week—breakfast and dinner, Monday through Friday). Dining facilities for Hale Kahawai are located in Jefferson Hall; for all other residence hall residents, in Gateway House.

There are no facilities on campus for temporary housing or for married students.

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

Application-contracts must be accompanied by a $25 deposit before consideration for space reservation can be made. Room and board fee is $360 per semester.

Off-Campus Housing. The Student Housing Office maintains information files on rooming houses, rooms in private homes, a few apartments, and room and board jobs. The housing office gives all possible assistance
in locating suitable accommodations after the student arrives; because of the rapid turnover the names of landlords cannot be sent through the mail. Negotiations with off-campus landlords must be handled directly by the student. Students arriving in Honolulu without housing reservations are invited to come to the housing office for general information and current listings of available accommodations.

For information on campus or off-campus housing write to: Director of Student Housing, Johnson Hall A, 2555 Dole St., University of Hawaii, Honolulu, Hawaii 96822.

Food Services. In addition to those in Gateway House mentioned above, dining facilities on the campus include:

- Hemenway Hall Cafeteria. Meals a la carte are served.
- East-West Center Cafeteria. A complete food service in Jefferson Hall, including a cafeteria, a snack bar, and private dining rooms.
- A snack bar in the northeast section of the campus.

Expenses. Minimum expenses are estimated at from $1,400 to $1,900 a year for board, room, tuition, registration, course fees, and books. Off-campus housing may be higher. These estimates do not include the cost of clothing, laundry, transportation, and other personal items. Students from outside the state should add the cost of transportation to and from Hawaii.

INTERNATIONAL STUDENT OFFICE

The International Student Office helps students from outside the United States with their immigration requirements, financial problems, living arrangements, and other non-academic matters. Special orientation programs for new students are held each semester prior to the beginning of classes. Foreign students who have been admitted to the University are notified of these programs by mail and are urged to arrive in time to attend them.

The office also assists persons and groups interested in building international understanding through contact with foreign students. Further information may be obtained from the Foreign Student Adviser, Webster Hall 101.

Foreign students who are graduates of accredited institutions and who are applying for admission should write to the Dean of the Graduate Division. Other specific inquiries or requests for more detailed information may be addressed to the Foreign Student Adviser, University of Hawaii, 2528 The Mall, Honolulu, Hawaii 96822.

UNIVERSITY PLACEMENT OFFICE

The University Placement Office actively assists graduate students and alumni who are seeking career employment. The office cultivates the
interest of prospective local, mainland, and overseas employers and provides them with facilities to contact candidates who are available for employment. Campus interviews are scheduled for representatives of academic, business, industrial, and government organizations. Credential files are established for students who are interested in an academic career. Early registration is encouraged during the final year of study.

COUNSELING AND TESTING CENTER

The Center's staff consists of professionally trained counselors, psychologists, psychometrists, and psychiatrists who function on the campus in the areas of student service, graduate training, and academic research. Educational, vocational, and personal counseling are available to students. Various aptitude, interest, and other psychological tests are often used as an aid to the counseling process. The Center also maintains an educational and vocational library and administers a reading improvement program.

STUDENT HEALTH SERVICE

The Student Health Service seeks to maintain a state of optimum health, both physical and mental, among students and to indoctrinate each student with the proper understanding and habits of personal and community health.

The University expects every student to safeguard his health and offers certain aids toward that end. Before admission, every daytime student must have a medical examination by a licensed physician. The student makes his own arrangements and pays the physician. The University provides a form for reporting the examination to the Service. Yearly tuberculin or chest X-ray examinations are required of all daytime students, except for a certain group for whom this is required more than once a year. Failure to comply with these requirements precludes registration for the following semester.

The Service offers a limited medical care program. A clinic provides outpatient physician and nursing care 7:45 a.m. to 4:30 p.m. Monday through Friday. An infirmary is operated on a 24-hour basis with a registered nurse on duty and a physician on call 7 days a week during regular sessions of the University. Bed care for minor illness and injury is provided. Medical care beyond the scope of the medical service provided by the Health Service is the financial responsibility of the student; supplemental insurance coverage, at least equal to that offered by the University to support this care, is essential.

EAST-WEST CENTER

The East-West Center—the Center for Cultural and Technical Interchange between East and West—was established by the U.S. Congress in
The goal of the Center is to further mutual understanding among the peoples of Asia, the Pacific area, and the United States. This goal is the guideline for the operation of the Center's four main divisions: the Institute for Student Interchange, the Institute for Technical Interchange, the Institute of Advanced Projects, and the Division of Central Programs.

Institute for Student Interchange

Scholarships. Young men and women possessing a high degree of leadership potential and scholastic ability and giving evidence of real interest in the goals of the Center may qualify for scholarships which provide transportation to and from Honolulu, tuition and books, housing and meals, accident and health insurance, and a monthly incidental allowance. The scholarships may include a field study grant to the mainland United States or Asia. Scholarships are for 9 or 12 months with provisions for extensions for those who qualify.

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

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

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

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

Language Requirements. Because the medium of instruction at the University of Hawaii is English, Asian and Pacific student grantees are tested for English proficiency by the University's English Language Institute. Those requiring extra help are assigned to full-time or part-time training in English until they are ready for a full academic program.

American students are required to complete at least two years of Asian language before the end of their grants.
Asia-America Program. Seminars conducted for East-West Center students by the faculty of the University are designed as a bridge that will enable Asians and Americans to develop the intercultural understanding recognized as one of the basic functions of the Center. Both groups of students play a vital role in the seminars by providing sources of information and guidance and by their critical and constructive comparisons of the various Asian societies with the variations in culture found in American society. Attendance at the seminars is required as a partial fulfillment of the Center scholarship grant.

The Asia-America Program also offers a film series, a lecture and visual arts program, and other non-academic activities for grantees. A browsing room and library of paperback books are also available.

Institute for Technical Interchange

The Institute for Technical Interchange brings to the East-West Center participants with needs for training in specific skills and techniques. Some of the projects currently handled by the Institute are medical technology, nursing, public health, museum and stage techniques, food production, public administration, hotel management and tourism, education, university administration, and teaching techniques in English. In addition, participants are sent to various parts of the Pacific or to Asia for training in the field. As participants learn specific techniques, they also gain a deeper understanding of the varying cultures of their fellow participants.

Institute of Advanced Projects

The Institute of Advanced Projects promotes mutual understanding between East and West through exchange of persons and scholarly publications programs. Senior specialists in Asian-Pacific affairs are invited to pursue their individual research and writing projects in functional groups and with the aid of the East-West Center Library; international development fellows are assisted in their doctoral studies; Research Translations translates Asian scholarly materials into English. A community of scholars, the Institute of Advanced Projects thus serves both the scholars in residence and the world of scholarship at large.

Central Programs

This division includes the administrative offices of the Chancellor, Deputy Chancellor, and its Fiscal and Administrative Management units, and Central Programs.

Central Programs' activities reach beyond the Center to the community and to Asia, the Pacific, and the United States through conferences and materials prepared and distributed by the Public Affairs staff. The Community Relations office coordinates activities of the Center and its students with Hawaii's residents on all islands, working with the Friends of the East-West Center, an organization of volunteers.
General Information

East-West Center Buildings. Facilities include Thomas Jefferson Hall, the administration building which houses offices, a food center, and conference rooms; Hale Manoa, men's residence; Hale Kuahine, women's residence; John F. Kennedy Hall, theatre-auditorium; and Abraham Lincoln Hall, which houses the Institute of Advanced Projects.

For Further Information

Asian-Pacific Scholarships. Write to U.S. Information Service, American Embassy, or U.S. Educational Foundation, located in each Asian or Pacific country.

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

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

Technical Training. Write to the Vice-Chancellor, Institute for Technical Training Interchange, East-West Center, 1777 East-West Road, Honolulu, Hawaii 96822.
Academic Information

ADMISSION

Deadlines. Applications for admission must be received by July 15 or December 15 for admission the succeeding semester.

Application. Students with baccalaureate degrees from accredited American institutions of higher learning or, in the case of foreign students, baccalaureate degrees fully equivalent to the bachelor's degree granted by an American university, are accorded admission 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; (2) that the required B grade average in all post-baccalaureate work is maintained; and (3) that the student can be accommodated in the field in which he wishes to study.

The Dean of the Graduate Division may deny admission, however, if the record of scholarship is not sufficiently distinguished, or if he judges the undergraduate program not to have been such as to furnish an adequate foundation for advanced academic or professional study. These provisions affect all applicants whether from colleges or schools in the United States or elsewhere.

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

Students applying for admission must submit the following:

Graduates of American Universities:

Classified students:
1. Application form (inside front cover).
2. Transcripts (two complete sets) from each institution attended.
3. Records of examinations (GRE, MAT, etc.) as required by departments. (See special requirements under field listings.)

Unclassified students:
1. Certification of degree or transcript.

Graduates of Foreign Universities (non-Americans):
1. Application form (inside front cover).
2. Transcripts (two complete sets) from each institution attended.
3. Records of examinations (GRE, MAT, etc.) as required by departments. (See special requirements under field listings.)

4. Statement of financial support.

5. Results of Test of English as a Second Language.

Test of English as a Foreign Language.* All applicants from foreign countries where the English language is not the usual means of communication are required to take the Test of English as a Foreign Language, which is administered three times a year—in January, May, and October. Applications for admission will not be processed until the Graduate Division has received the TOEFL results. To take the tests, students should write to TOEFL, Educational Testing Service, Princeton, New Jersey 08540, for testing details.

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 are designated as classified (regular, probational, special) and unclassified students.

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

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

Special students are those who have been admitted to special non-degree training or certificate programs.

Unclassified students are those not in any of the above categories.

REGISTRATION AND CREDITS

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

Transcript. Certification of the bachelor's degree by transcript must be

*English Language Institute. After arrival at the University, all foreign students are referred to the director of the University's English Language Institute for determination of their proficiency in English. Those needing further training will be assigned to the Institute for a full-time or part-time program. The Institute offers intensive training in reading, writing, speaking, and listening. Students assigned full time to the Institute must pay $70.00 in special course fees in addition to regular tuition and fees. Students assigned to the Institute on a part-time basis will pay a smaller amount for special course fees. Registration in the English Language Institute is limited to students who have been admitted to departments in the University. Students applying for admission to the English Language Institute or to the Graduate Division for the sole purpose of improving their English will not be considered for admission.
submitted to the Graduate Division office upon registration for degrees awarded in June and by November 30 for those awarded in August.

**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
- 9 credits, including 1 graduate course
- 12 credits, undergraduate courses exclusively

A doctoral candidate, however, carrying fewer than 8 credits may be certified by his adviser as carrying a full load. For graduate assistants and research assistants, the minimum full-time load is 6 credits. Because their duties ordinarily require 20 hours per week, they are restricted to 9 hours of course work for credit (including thesis research 800).

**Late Registration.** Registration after the officially designated period is rarely permitted. The procedure is as follows: (1) during the first seven days following the last official day of registration, written approval must be obtained from the Dean of the Graduate Division, (2) after the seventh day, written approval must be obtained from the Dean and the instructor concerned, and students may enroll only for individual reading or research courses, the thesis course (800), or as auditors.

**Change in Registration.** An official blank may be obtained from the Graduate Division. The endorsed form should be submitted to the business office.

**Withdrawal from the University.** Withdrawal from the University is applied for on a form issued by the Admissions and Records office, and this blank, properly endorsed, must be submitted to the business office.

**Withdrawal from Courses.** During the first three weeks of a semester, an approved withdrawal is marked W on the student's record. Withdrawal at a later date, but before the last four weeks of class instruction in a semester, is marked W if the student's performance in the course warranted a passing grade. Otherwise, it is recorded WF. A student may not withdraw from a course during the last four weeks of instruction in a semester. However, the Dean may permit him to withdraw from the University. If a student withdraws from a course without approval, he will receive an F for the course.

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

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

Credit by Examination. Graduate students may obtain credit by examination in courses numbered 400-599 with the approval of the qualifying, thesis, or program committees, 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.

College of General Studies Credits. To obtain credit in the Graduate Division for courses taken in the College of General Studies requires approval of the student's adviser and the Dean of the Graduate Division at the time of registration in the Graduate Division. Cards for approval are available from the Graduate Division office or the College of General Studies.

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 400-599 are upper-division undergraduate courses which may be used to fulfill advanced degree requirements.

GRADUATE BULLETIN, 1966-67

GRADES, GRADE POINTS, GRADE-POINT RATIOS

Graduate students as well as undergraduate students are graded \( A, B, C, D, F, I, S, \) and \( W \).

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

The thesis is graded \( S \) (satisfactory). Failure to make satisfactory progress on a thesis does not entitle a student to refund of tuition fees.

An \( I \) is recorded if a student 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 failure was caused by conditions beyond the student's control and not by carelessness or procrastination. Instructors will send a report of Incomplete to each student receiving an
I, indicating the steps to be taken to receive a passing grade. To receive credit for a course in which an I has been reported, the student must make up the incomplete work before the Thanksgiving or Easter recess of the next semester in which the student is in residence. If the work is not completed then, the I will be changed to F at the end of the semester. If the work is completed, the instructor will report a semester grade, taking the completed work into consideration. Credit in a course for which an F is given may be obtained only by passing the course, or its equivalent, either at the University of Hawaii or at some other accredited institution of higher education.

Grade-point ratios are computed by dividing the total number of grade points by the total number of credits for which a student has been registered. Grades of W or I are not included in the computation of ratios. Grades of F or WF are included until credit is subsequently obtained in the courses in which failures have been reported.

REQUIREMENTS FOR CONTINUED REGISTRATION

To remain eligible for further graduate work and to be awarded a graduate degree, candidates and intended candidates must have a B average (3.0 grade-point ratio) for all courses they have completed. In addition, they must also have a B average for all graduate courses (i.e., courses numbered 600 and above) they have completed.

Credit-hour requirements for graduate degrees can only be fulfilled by grades of A, B, and C. Grades below C will not be counted toward the completion of requirements for advanced degrees but will be counted in computing the grade-point ratio. In computing the GPR of a student who has been required to retake an undergraduate course in which he received a grade of C or D, all grades in that course will be included, as will the appropriate number of units for each time the course was repeated. However, for purposes of fulfilling requirements for a graduate degree, only the credits earned the first time the course was taken will be allowed (i.e., counted).

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

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

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

CONFERRING OF DEGREES

Degrees are conferred and diplomas awarded twice annually, in January and in June of each year. Commencement exercises are held in June only. 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 the Admissions and Records office in Bachman Hall, not to the Graduate Division.

TRANSCRIPTS

Transcripts may be obtained from the Admissions and Records office.

RESPONSIBILITY

Students admitted to the Graduate Division are assumed to be mature adults and are expected to behave accordingly. The advisory services provided for in the operation of the various graduate programs assist the students. However, the student alone is responsible for following the procedures and completing the steps required in his program. Failure of an adviser to remind a student of a requirement or deadline date is not acceptable as a basis for waiver of the requirement. 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
- Chinese
- Drama and Theatre
- Economics
- English
- French
- Geography
- German
- History
- Japanese
- Linguistics
- Mathematics
- Music
- Pacific Islands Studies
- Philosophy
- Political Science
- Psychology
- Sociology
- Spanish
- Speech Teaching of English as a Second Language

The Master of Science is offered in:
- Agricultural Economics
- Agricultural Engineering
- Agronomy
- Animal Sciences
- Biochemistry
- Botany
- Chemistry
- Civil Engineering
- Electrical Engineering
- Entomology
- Food Science
- Genetics
- Geological Sciences
- Horticulture
- Meteorology
- Microbiology
- Nursing
- Nutrition
- Oceanography
- Pharmacology
- Physics
- Physiology
- Plant Pathology
- Public Health
- Soil Science
- Speech Pathology & Audiology
- Zoology

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

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

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

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

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

**Residence**

The minimum residence requirement is two semesters of full-time work or four six-week summer sessions. For the Master of Social Work, four semesters of full-time work are required.

**Time Allowed**

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

Upon recommendation of the Graduate Faculty and no later than admission to candidacy, no more than 8 semester hours of graduate credit may be transferred from accredited institutions upon recommendation of the Graduate Faculty. No credit from another institution may be transferred 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. The student is responsible for delivering the transcripts to the Graduate Division. Only grades of B or better will be transferred. However, all grade points and credits will be counted in computing the cumulative grade-point ratio.

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 doctor's degrees.

PLAN A (THESIS)

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

Credit-Hour Requirements. A minimum of 24 credit hours of course work and 6 credit hours of thesis research is required. In unusual cases, upon recommendation by the thesis committee no later than the registration period of the session during which the degree is conferred, either fewer credits or a maximum of 12 credits may be granted for thesis research. A minimum of 12 credits, exclusive of research methods courses, must be earned in courses numbered 600-799, including at least one graduate seminar related to the major field. A maximum of 4 credits may be allowed in directed research courses (600 and 799).

Candidates must be registered in the appropriate thesis research course (800) during the entire semester in which the work for the degree is completed, except that candidates who complete all requirements for the degree during the regular six-week summer term need not be registered during the subsequent fall semester.

Thesis Requirement. When a thesis problem has been approved by the graduate faculty of the student's field of study, the chairman sends to the Graduate Division the candidate's name, the thesis title, and a recommendation for membership of the thesis committee. The committee will include one member from outside the major field of study. The student may then enroll in the thesis research course (800).
The thesis title must be submitted to the Graduate Division by January 15 or May 15 of the session preceding the one in which the candidate expects to complete the requirements for the degree. Candidates who expect to finish their program during the summer session must submit the thesis topic to the Graduate Division by the preceding February 1.

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

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 must be deposited with the secretary of 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. Before admission to candidacy the student must pass a general examination in his major field of study. This examination is given during the first semester. It is designed to reveal the quality of the student's preparation for advanced work in his field and his ability to pursue graduate work at the master's level.

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

Final Oral Examination. This examination covers the thesis and related areas. It is conducted by the thesis committee and is open to all faculty members. Should the student fail the final examination he may repeat it upon recommendation of the graduate faculty concerned and approval of the Dean of the Graduate Division.

Summary of Procedure

1. Application for admission to the Graduate Division
2. Preliminary conference
3. Appointment of interim adviser
4. General examination
5. Admission to candidacy
6. Appointment of thesis committee
7. Approval of thesis title by thesis committee
8. Application for diploma
9. Completed thesis submitted to committee
10. Final oral examination
11. Final copies of thesis submitted to Graduate Division
12. Payment of diploma and thesis binding fees
13. Granting of the degree

PLAN B (NON-THESIS)

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

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

Credit-Hour Requirements. A minimum of 30 graduate credit hours is required. Of these at least 6 shall be earned in courses outside the major field. A minimum of 18 credits must be earned in courses numbered 600–799, including at least one graduate seminar related to the major field.

When the student is advanced to candidacy, the chairman of the field of study appoints a program committee of three members of the graduate faculty, one of whom shall be from a field of study other than the major. The program committee advises the candidate and approves a coherent program of courses for the candidate.

Examinations

General Examination. Before admission to candidacy the student must pass a general examination in his major field of study. This examination is given during the first semester. It is designed to reveal the quality of the student's preparation for advanced work in his field and his ability to pursue graduate work at the master's level.
A student who fails the general examination may repeat it after three months upon recommendation of the graduate faculty of the major field of study and approval of the Dean of the Graduate Division. The student will not be considered for candidacy again should he fail the general examination twice.

**Seminar Appearance and Examination.** Candidates shall make a seminar appearance near the conclusion of their program to which all members of the graduate faculty shall be invited, at which time they shall be examined by the program committee. Should the student fail the final examination or seminar appearance he may be permitted to repeat the examination only if this is recommended by the graduate faculty concerned and is approved by the Dean. At least three months must elapse before such re-examination.

**Summary of Procedure**

1. Application for admission to the Graduate Division
2. Preliminary conference
3. Appointment of interim adviser
4. General examination
5. Admission to candidacy and appointment of program committee
6. Establishment of program of courses
7. Diploma application
8. Seminar appearance and examination
9. Payment of diploma fee
10. Completion of course work
11. Granting of the 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.

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

- Agricultural Economics
- Anthropology
- Biochemistry
- Botany
- Chemistry
- Entomology
- Genetics
- Geological Sciences
- History
- Horticulture
- Linguistics
- Meteorology
- Microbiology
- Pharmacology
- Philosophy
- Physics
- Physiology
- Political Science
- Psychology
- Soil Science
- Zoology
Residence

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

Credits

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

Language Requirements

The student must demonstrate comprehension of two foreign languages. To test for comprehension the student will be given a written examination. To pass the examination he must be able, with the aid of a dictionary, to read comprehensively at reasonable speed research materials in his field of interest. The several graduate faculties will provide suitable materials on which to base the language examinations. The examinations will be administered by the faculty of the appropriate language department.

Examinations are given three times each year as announced by the Graduate Division.

The student must pass one of the examinations in the required foreign languages before he can be admitted to candidacy. The Graduate Division office must be notified that the candidate has passed the examinations in both languages before he will be permitted to take the comprehensive examination.

Doctoral candidates from foreign countries where the English language is not normally used in the school system may use English as one of the foreign languages required, upon petition approved by the graduate faculty concerned and the Dean of the Graduate Division.

Dissertation Committee

Upon admission to candidacy, the chairman of the graduate faculty of the field of study recommends to the Dean of the Graduate Division appointment of a dissertation committee consisting of at least five members, including representatives of the minor field or fields. This committee, appointed by the Dean of the Graduate Division, prescribes for the candidate a course of study in preparation for the comprehensive examination. The committee conducts the comprehensive and oral examinations described below. It also approves the dissertation research problem and dissertation itself (see below).
Examinations

Doctoral candidates must pass the following examinations:

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

2. **A final oral examination in defense of the dissertation.** This examination cannot be taken until after the comprehensive examination has been passed. If the student fails the final examination he may be allowed to repeat it upon petition approved by the graduate faculty concerned and the Dean of the Graduate Division.

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

Dissertation

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

When the dissertation topic has been approved by the dissertation committee, it will notify the Graduate Division. At this time the candidate may register for the dissertation research course (800).

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

The candidate should look to the chairman of his dissertation 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 secretary of the Graduate Division by the deadline specified in instructions issued to all candidates at the beginning of the session in which
the degree is conferred. Additional bound copies may be required by individual departments.

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

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

Summary of Procedure

1. Application for admission to the Graduate Division
2. Preliminary conference
3. Appointment of interim adviser
4. Certification of proficiency in one foreign language
5. Admission to candidacy and appointment of dissertation committee
6. Approval of dissertation proposal
7. Certification of proficiency in second foreign language
8. Diploma application
9. Comprehensive examination
10. Final examination
11. Copies of dissertation filed in Graduate Division
12. Payment of diploma and dissertation binding fee
13. Granting of the degree

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

PROFESSIONAL TEACHING CERTIFICATE

The Department of Education of the state of Hawaii issues the professional teaching certificate to teachers in the employ of the Department who, after receiving the Bachelor of Education degree or its equivalent, earn a total of 30 semester hours, 6 of which must be in graduate courses (600–799) in education. For purposes of such certification, the Bachelor of Education equivalent is defined as a bachelor's degree with 18 semester hours in education courses and practice teaching under the supervision of an accredited teacher training institution.
Graduate Fields of Study

FACULTIES, REQUIREMENTS, AND COURSES

Courses listed here numbered 400–599 are undergraduate courses 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 Catalogue. 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) - marketing
H. L. Baker, Ph.D. - forest economics
E. R. Barmettler, Ph.D. - marketing
J. T. Ishida, Ph.D. - marketing
A. B. Larson, Ph.D. - price analysis
C. W. Peters, M.S. - marketing
P. F. Philipp, Ph.D. - production economics
H. Spielman, Ph.D. - marketing
C. P. Wilson, Ph.D. - marketing and agricultural policy

AFFILIATE FACULTY

P. P. Wallrabenstein, Ph.D. - statistics

Candidates for the M.S. degree must present a minimum of 18 hours of undergraduate credit in agricultural economics, general economics, or business, including a minimum of 12 hours in agricultural economics or general economics.

A thesis (Plan A) will be required for the M.S. program in most instances. A non-thesis program (Plan B) is permissible in special cases. For Plan A, a minimum of 12 hours, exclusive of thesis must be selected from the agricultural economics courses listed below. For Plan B, a minimum of 18 hours must be selected from courses listed below. The remaining course requirements may be elected from related fields with the approval of the program committee. Twelve hours, exclusive of thesis, must be in courses numbered 600 or above, at least 9 of which must be in agricultural economics.
Candidates for the Ph.D. in agricultural economics must meet requirements specified for admittance to candidacy for the M.S. in agricultural economics.

AGRICULTURAL ECONOMICS

423 Agricultural Cooperatives (3)
424 Marketing of Tropical and Subtropical Agricultural Products (3)
425 Marketing of Livestock, Poultry and Dairy Products (3)
426 Agricultural Economics Extension (3)
428 Production Economics (3)
429 Agricultural Policy and Planning (3)
430 Agricultural Finance (3)
431 Forest Economics (3)
433 Advanced Farm Management and Plantation Economics (3)
434 Statistical Methods
435 Consumer Economics and Food Distribution (3)
621 Marketing Research (3)
625 Economics of Agriculture: Tropical Countries and Asia (3)
626 Collection of Economic Data in Agriculture (3)
629 Production Economics (3)
630 Market Development for Agricultural Products (3)
632 Economics of Agricultural Processing Industries (3)
634 Advanced Agricultural Prices and Statistical Analysis (3)
636 Seminar: Agricultural Policy (3)
637 Economics of Agricultural Resource Development (3)
638 Seminar: Land Use in Developing Countries (3)
639 Financing Agriculture in Developing Countries (3)
699 Directed Research (arr.)
800 Thesis Research (arr.)

Agricultural Engineering

GRADUATE FACULTY

J. K. Wang, Ph.D. (Chairman) — farm processing, power and machinery
H. M. Gillin, M.S. — cooling and handling of farm products
D. M. Kinch, Ph.D. — power and machinery, farm processing
I-pai Wu, Ph.D. — irrigation engineering

AFFILIATE FACULTY

W. N. Reynold, M.S. — irrigation

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

Courses available for the graduate program are listed below. Courses from the related fields of civil engineering, mechanical engineering, mathematics, physics, food science, agronomy and soil science may be approved in a degree program. The only required course from related fields is Mathematics 402. Candidates may specialize in farm processing, power and machinery, or soil and water conservation. Required courses are marked with an asterisk.

AGRICULTURAL ENGINEERING

411 Methods of Post Harvest Handling of Agricultural Products (3)
631 Analysis of Implement Design (3)
635 Farm Irrigation System Design (3)
647 Methods of Agricultural Engineering (3)
**Fields of Study**

- 648 Post Harvest Process Engineering (3)
- 699 Directed Research (arr.)
- 700 Seminar (1)
- *800 Thesis Research (arr.)

**Agronomy**

**Graduate Faculty**
- L. D. Swindale, Ph.D. (Chairman)—soil management
- R. L. Fox, Ph.D.—soil and crop management
- D. L. Plucknett, Ph.D.—crop management
- P. P. Rotar, Ph.D.—plant breeding
- G. D. Sherman, Ph.D.—soil and crop management
- M. Takahashi, M.S.—tropical range management

**Affiliate Faculty**
- N. S. Hanson, Ph.D.—weed control
- W. G. Sanford, Ph.D.—agronomy
- J. N. Warner, Ph.D.—sugar cane breeding

Intended candidates for the M.S. must present a minimum of 18 undergraduate credits in agronomy which shall include 9 credits in agronomy and 9 credits in general soil science, plant physiology, and genetics or plant breeding. The undergraduate program must also include basic courses in botany, microbiology, chemistry, and statistics.

Courses in the major field are to be selected from those listed below. All candidates must register for the seminar in agronomy and soil science (soil fertility). Courses may be taken in related fields: botany, climatology, genetics, horticulture, agricultural engineering, and microbiology. Candidates may specialize in crop production or tropical range management.

**Agronomy**
- 501 Tropical Crop Production (3)
- 502 Principles of Agronomy (3)
- 503 Range Management (5)
- 699 Sugar Cane Agronomy (3)
- 800 Directed Research (arr.)
- *800 Thesis Research (arr.)

**Soil Science**
- 687 Soil Science Seminar (1)
- 689 Advanced Soil Fertility (4)
- 690 Advanced Soil Chemistry (arr.)

**American Studies**

**Graduate Faculty**
- S. Lutzky, Ph.D. (Chairman)—history and social backgrounds
- S. Brown, Ph.D.—politics and history of ideas
- R. Denney, B.A.—literature and sociology
- G. Hamaker, Ph.D.—history and political science
- J. McCutcheon, Ph.D.—social and cultural history

The American studies department offers a program designed as an interdisciplinary and intercultural approach to the study of the United States. Taking advantage of the University's location, library resources, and faculty interest, the department places a special emphasis on the problems of American relationships with Asian nations and cultures.
Recognizing the unique nature of the program and the difficulties of adequate undergraduate preparation, especially for Asian students, departmental requirements for intended candidates are flexible. Candidates should present a record indicating a wide range of study in the humanities and the social sciences or be willing to undertake additional work in those fields before their acceptance as degree candidates. The department offers a degree program under either Plan A (with thesis) or Plan B (non-thesis) programs. Under either plan candidates are required to take a minimum of 12 semester credits in American studies seminars. In addition, candidates must submit a program which includes courses in the following fields of study:

1. Literature and the Arts
2. History, Philosophy and Education
3. Other Social Sciences

Plan A should include a minimum of 6 hours each in two of the above three fields of study. Plan B should include a minimum of 9 hours in one of the three with 9 more chosen from the other two fields.

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

**American Studies**

- 685-686 Contemporary American Civilization (3-3)
- 600 Seminar: Asia-America (2)
- 630 Criticism in the Mass Media Age (3)
- 640 Asian Influences in American Civilization (3)
- 650 American Civilization and the Overseas American (3)
- 660 Seminar: Presidential Leadership and American Civilization (3)

- 670 Seminar: Analysis of Sociability in the United States (3)
- 685-686 Seminar: The Nature of American Society (3-3)
- 690 Introduction to Contemporary America (3)
- 699 Directed Research (arr.)
- 700 Methods in American Studies (3)
- 750 Seminar: The Interaction of Asia and America (3)
- 800 Thesis Research (arr.)

**Animal Sciences**

**Graduate Faculty**

O. Wayman, Ph.D. (Chairman)—general physiology and physiology of reproduction
E. H. Cobb, Ph.D.—animal breeding and quantitative genetics
R. B. Herrick, Ph.D.—poultry physiology
J. H. Koshi, Ph.D.—dairy science
K. K. Otagaki, Ph.D.—animal nutrition
A. L. Palafox, M.S.—poultry nutrition
E. Ross, Ph.D.—poultry nutrition
R. W. Stanley, Ph.D.—dairy nutrition

**Affiliate Faculty**

F. T. Lynd, D.V.M.—pathology

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

ANIMAL SCIENCES

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

Anthropology

GRADUATE FACULTY

A. G. Dewey, Ph.D. (Chairman)—Indonesia, Polynesia, Melanesia, social anthropology, culture change
S. B. Boggs, Ph.D.—culture and personality, applied anthropology (medicine and mental health), complex societies (occupations, values)
E. A. Cook, Ph.D.—Oceania, Southwest American Indians, values and social change, social structure and kinship, language and culture
S. A. Howard, Ph.D.—Polynesia, social and psychological anthropology, ethnoscience (on leave)
R. R. Jay, Ph.D.—Indonesia and Malaysia, social anthropology, social change
W. P. Lebra, Ph.D.—East Asia, social anthropology, religion
K. Luomala, Ph.D.—Polynesia, ethnology and folklore studies (on leave, spring term 1967)
T. W. Maretzki, Ph.D. (Department Chairman)—East Asia, psychology and applied anthropology, culture change
L. E. Mason, Ph.D.—Micronesia, ethnology, applied anthropology, culture change
W. G. Solheim, II, Ph.D.—Southeast Asia, archaelogy

AFFILIATE FACULTY

G. Bateson, M.A.—Melanesia, Indonesia, culture and personality, values
K. E. Emory, Ph.D.—Polynesia, archaelogy, ethnology
R. W. Force, Ph.D.—Oceania, culture change
F. Lynch S. J., Ph.D.—Philippines, values and social change
Y. Sinoto, D.Sc.—Polynesia and Japan, archaelogy

Intended candidates for the M.A. or Ph.D. need not have an undergraduate background in anthropology. Students with the B.A. in related fields are particularly welcome. All students are expected to acquire a common knowledge of the four basic areas in the field, biological anthropology, linguistics, archaelogy, social and psychological anthropology, during the first year of graduate work. Anthropology 650–651 is designed to review these subjects. While this course is not required, passing the final examination which is given at the end of each semester is mandatory for all candidates. A familiarity with the historical development of anthropology as a formal discipline and anthropological methods is also expected of all students.
The graduate program is designed to allow specialization within two broad fields of anthropology, social and psychological anthropology, and archeology. Specialized interests in biological anthropology may be pursued by working closely with the department of human genetics. Anthropologists who wish to concentrate on linguistic studies may work in a program jointly with the department of linguistics. A broad base in related courses in the social sciences, humanities, and natural sciences is strongly recommended for all students and specializations are expected to cross disciplinary lines in all cases.

M.A.

The M.A. candidate has a choice of a thesis program (Plan A, 24 semester hours and thesis) or a non-thesis program (Plan B, 30 semester hours, minimum of 18 in graduate courses in anthropology, and 6 in related fields). After a common core of anthropological knowledge has been established for the first year, students are left to develop their specialized interests. All students are required to take Anthropology 510, 700, and two offerings of 750. Also required is a course in statistics (Anthropology 500) or passing the final examination for this course. All students must demonstrate reading knowledge of one foreign language useful in the candidate's research. Candidates will be tested for their area of specialization in anthropology in a written comprehensive examination.

Ph.D.

In addition to the broad preparation in anthropology described as prerequisite for the M.A. degree, the doctoral candidate must demonstrate competence in anthropological theory construction, research design, and the collection and evaluation of data. He will be encouraged to undertake faculty supervised research prior to submitting his thesis proposal and conducting thesis research. He will also be expected to develop and demonstrate his abilities in teaching. While not all candidates will be teaching assistants, they are encouraged to give lectures or other presentations to undergraduate or graduate students and faculty. Required courses are Anthropology 510, 700, either 710 or 520-521 and four semester offerings of 750. All candidates must pass the examinations for Anthropology 650-651 and a comprehensive examination in their area of specialization. Reading knowledge in two foreign languages is required for all doctoral candidates. Upon recommendation of the supervisory committee, oral competence alone may be accepted for one of the two required languages. An intensive oral examination is given to all Ph.D. candidates prior to the beginning of field research. This examination covers the specialized subjects on which the individual student focuses his studies in graduate work. The doctoral dissertation must be based upon fieldwork in another culture; such fieldwork may take up one year and should not be less than eight months.
Courses for the graduate program may be selected from those listed below and from offerings in related fields of study as directed by the candidate's supervisory committee. A bimonthly seminar is scheduled for the presentation of theoretical issues and original research by faculty, graduate students, and visiting anthropologists. Graduate students are expected to attend. The department requests a copy of both M.A. and Ph.D. theses for the departmental files.

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

ANTHROPOLOGY

450 Regional Cultures of Oceania (3)
   (1) Hawaii
   (2) Micronesia
   (3) Polynesia
   (4) Melanesia

460 Regional Archeology (3)
   (1) Asia and the Pacific
   (2) Europe, Africa, and the Near East
   (3) North and South America

Arts in Cultural Perspective

470 Folklore (3)
   (Art 474, Primitive Art, and Music 471, Music of Non-literate Peoples)

500 Anthropological Statistics (3)

510 Foundations of Anthropological Method (3)

520-521 Archeological Techniques (3-3)

550 Anthropological Applications (3)
   (1) Dependency Administration
   (2) Health
   (3) Education (Ed HP 570)
   (4) Overseas Operations

650-651 Proseminar: General Anthropology (6-6)

660 Social Organization (3)

665 Psychological Anthropology (3)

670 Archeology (3)

675 Anthropology of Religion (3)

690 Ecological Anthropology (3)

699 Directed Reading or Research (arr.)

700 History of Anthropology (3)

710 Anthropological Techniques (3)

750 Research Seminar (3)
   (1) Archeology
   (2) Linguistics
   (3) Ethnography
   (4) Social Anthropology
   (5) Applied Anthropology
   (6) Psychological Anthropology
   (7) Biological Anthropology

800 Thesis Research (arr.)

Anthropology Seminar (no credit)
Art

GRADUATE FACULTY

M. Turnbull, M.A. (Chairman) — painting
C. W. Anderson, M.A. — painting, design
J. H. Cox, M.A. — painting, Oceanic art
A. B. Etherington, B.Arch. — architecture
M. T. Everson, M.F.A. — weaving, textile design
C. F. Horan, M.A. — ceramics
K. G. Kingrey, M.A. — design
S. Kimura, M.A. — illustration
H. O. McVay, M.A. — ceramics
P. Neogy, M.A. — Asian art
B. Norris, B.A. — painting
H. A. Robinson, M.A. — textiles
E. Staszak, M.F.A. — painting, printmaking

The M.A. is given only in the field of Far Eastern art history. Intended candidates must present the equivalent of an undergraduate major in the history of art including 24 credits in art history and related courses, and, in addition to English, a reading knowledge of one language in which a considerable body of relevant literature is published. The faculty will determine the suitability of Plan A or Plan B at the preliminary conference.

The M.F.A. (Plan A only) is awarded for creative studio work in one or more of the following media: (1) drawing and printmaking, (2) painting, (3) weaving and textiles, (4) ceramics, (5) visual design. The thesis includes an exhibition of original work in the chosen medium. Intended candidates must present the equivalent of an undergraduate major in art including 18 credits in art history and theory. Evidence of ability to do creative work of superior quality must be presented by means of a portfolio or slides.

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

An otherwise deficient or incompatible undergraduate program will require, at the discretion of the graduate faculty, additional course work for either degree. It is unlikely that the M.F.A. can be earned with less than two years of study.

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

Art 689 and 800 are required courses for the M.A.
Art 690 and 800 are required courses for the M.F.A.
Asian Studies

GRADUATE FACULTY

R. S. Anderson, Ph. D. (Chairman) — education
G. Artola, Ph.D.— Asian and Pacific languages
R. Jay, Ph.D.—anthropology
P. H. Lee, Ph.D.—Korean
D. H. Kornhauser, Ph.D. — geography
W. Maurer, Ph.D.— Asian and Pacific languages
G. Raymond Nunn, Ph.D.—history
Yao Shen, Ed.D.—Chinese
W. Vella, Ph.D.—history

Asian studies is a multidisciplinary area program leading to the M.A. degree. Students may concentrate their studies in a particular country or region of Asia. Specialization is also possible on topical problems which cut across national boundaries. All students will be required to have control of an Asian language adequate for research in their special geographical area of interest. Written evidence of such control must be presented. They will also be expected to gain a broad basic knowledge of Asia, in addition to their specialty. This will be tested in a comprehensive examination during the last semester in residence. Though primarily designed for American students, to give them a broad general back-
ground of information on a culture in Asia, the major is also open to Asian nationals, provided they concentrate in a language and area not native to them.

Intended candidates for the M.A. in Asian studies should present a minimum of 15 semester hours credit in Asian studies at the undergraduate level, or comparable experience in the field, such as that of a Peace Corps volunteer, sufficient to engage profitably in graduate work in interdisciplinary study. Students lacking such background may be required to take, without credit toward the degree, such area courses as are deemed necessary to make up the deficiencies.

Requirements for the M.A. in Asian studies include: (1) a concentration of approved courses in one discipline so as to enable the student to gain a grounding in the special approach and techniques of that discipline; (2) 6 semester credits of approved Asian courses in one cognate field; (3) a graduate Asian studies seminar; (4) 6 credits of thesis research, or in a second cognate field.

The major field may be a country of East Asia, Southeast Asia, or South Asia. Courses other than the general requirements will be determined by the supervising committees in consultation with the student.

There are some 179 language and area courses dealing with Asia which are open to graduate students in Asian studies, 28 of them dealing in whole or in part with Southeast Asia, 26 South Asia, and 125 East Asia. For complete listing see bulletin of the Asian studies department, Asian Studies Courses of Instruction.

**ASIAN STUDIES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>521-522</td>
<td>Civilizations of the East: Japan, China, and Korea (3-3)</td>
</tr>
<tr>
<td>523-524</td>
<td>Civilizations of the East: Southeast Asia (3-3)</td>
</tr>
<tr>
<td>525-526</td>
<td>Civilizations of the East: South Asia (3-3)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research (3-3)</td>
</tr>
<tr>
<td>798-799</td>
<td>Seminar in East Asian Studies (3-3)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
</tr>
</tbody>
</table>

**Biochemistry and Biophysics**

**GRADUATE FACULTY**

- T. Winnick, Ph.D. (Chairman) - metabolism and biosynthesis of proteins and peptides
- G. A. Barber, Ph.D. - carbohydrate metabolism
- J. B. Hall, Ph.D. - nucleic acids and viruses
- R. H. McKay, Ph.D. - physical biochemistry, biological oxidations
- H. F. Mower, Ph.D. - biological nitrogen fixation; energy transfer mechanisms
- L. H. Piette, Ph.D. - mechanisms of organic and biological reactions, electron paramagnetic resonance
- K. T. Yasunobu, Ph.D. - relationship of enzyme structure to function

**AFFILIATE FACULTY**

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

Intended candidates for either the M.S. or Ph.D. must have or acquire adequate preparation in organic, physical, and analytical chemistry. They
should consult with the department faculty in planning their curricula and in choosing appropriate courses offered by other departments such as microbiology, physiology-pharmacology, genetics, zoology, chemistry, and mathematics. Available courses are listed below.

BIOCHEMISTRY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>441</td>
<td>Basic Biochemistry (3)</td>
<td></td>
</tr>
<tr>
<td>442</td>
<td>Basic Biochemistry Laboratory (1)</td>
<td></td>
</tr>
<tr>
<td>561-562</td>
<td>General Biochemistry (3-3)</td>
<td></td>
</tr>
<tr>
<td>571-572</td>
<td>General Biochemistry Laboratory (2-2)</td>
<td></td>
</tr>
<tr>
<td>585</td>
<td>Biochemistry Literature (1)</td>
<td></td>
</tr>
<tr>
<td>610</td>
<td>Special Topics in Enzymology (2)</td>
<td></td>
</tr>
<tr>
<td>615</td>
<td>Advanced Carbohydrate Metabolism (2)</td>
<td></td>
</tr>
<tr>
<td>620</td>
<td>Bioenergetics (2)</td>
<td></td>
</tr>
<tr>
<td>630</td>
<td>Nucleic Acids and Viruses (2)</td>
<td></td>
</tr>
<tr>
<td>635</td>
<td>Metabolic Regulation (1)</td>
<td></td>
</tr>
<tr>
<td>640</td>
<td>Biosynthesis of Proteins and Peptides (1)</td>
<td></td>
</tr>
<tr>
<td>655</td>
<td>Enzymology Laboratory (arr.)</td>
<td></td>
</tr>
<tr>
<td>671-672</td>
<td>Seminar (1)</td>
<td></td>
</tr>
<tr>
<td>699</td>
<td>Directed Research (arr.)</td>
<td></td>
</tr>
<tr>
<td>701</td>
<td>Marine Biochemistry (1)</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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BIOPHYSICS

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>591-592</td>
<td>Survey of Biophysics (2-2)</td>
<td></td>
</tr>
<tr>
<td>751-752</td>
<td>Topics in Biophysics (1-1)</td>
<td></td>
</tr>
<tr>
<td>760</td>
<td>Biophysics Laboratory (3)</td>
<td></td>
</tr>
</tbody>
</table>

Botany

GRADUATE FACULTY

- N. P. Kefferd, Ph.D. (Chairman) — physiology
- G. E. Baker, Ph.D. — mycology
- A. J. Bernatowicz, Ph.D. — phycology
- B. J. Cooil, Ph.D. — physiology
- M. S. Doty, Ph.D. — phycology
- G. W. Gillett, Ph.D. — systematics
- C. H. Lamoureux, Ph.D. — anatomy
- D. Mueller-Dombois, Ph.D. — ecology
- E. W. Putman, Ph.D. — physiology
- B. J. Rogers, Ph.D. — physiology
- A. C. Smith, Ph.D. — systematics

AFFILIATE FACULTY

- D. P. Gowing, Ph.D. — physiology
- B. Krauss, M.S. — anatomy
- L. G. Nickell, Ph.D. — physiology
- W. G. Sanford, Ph.D. — physiology

Intended candidates must present a minimum of 18 hours of undergraduate credit in botany or related subjects, such as microbiology or developmental biology. Within the undergraduate and graduate programs the student is required to demonstrate adequate preparation in physiology, morphology, and systematics. Thesis work may be undertaken in systematics, morphology, ecology, physiology, mycology, and phycology. Courses available for the graduate program are listed below.

BOTANY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>410</td>
<td>Plant Anatomy (3)</td>
<td></td>
</tr>
<tr>
<td>412</td>
<td>Microtechnique (3)</td>
<td></td>
</tr>
<tr>
<td>418</td>
<td>Cytology (3)</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
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</tr>
<tr>
<td>420</td>
<td>Primitive Angiosperms and Phytogeographic Theory</td>
<td>3</td>
</tr>
<tr>
<td>430</td>
<td>Mycology</td>
<td>3</td>
</tr>
<tr>
<td>436</td>
<td>Medical Mycology</td>
<td>3</td>
</tr>
<tr>
<td>454</td>
<td>Ecology II</td>
<td>4</td>
</tr>
<tr>
<td>461</td>
<td>Taxonomy of Vascular Plants II</td>
<td>3</td>
</tr>
<tr>
<td>470</td>
<td>Principles of Plant Physiology</td>
<td>4</td>
</tr>
<tr>
<td>480</td>
<td>Phycology</td>
<td>3</td>
</tr>
<tr>
<td>610</td>
<td>Botanical Seminar</td>
<td>1</td>
</tr>
<tr>
<td>612</td>
<td>Advanced Botanical Problems (arr.)</td>
<td></td>
</tr>
<tr>
<td>615</td>
<td>Morphology Seminar</td>
<td>2</td>
</tr>
<tr>
<td>620</td>
<td>Evolution</td>
<td>2</td>
</tr>
<tr>
<td>631</td>
<td>Marine Phytoplankton</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(same as Ocean 631)</td>
<td></td>
</tr>
<tr>
<td>650</td>
<td>Environmental Phytogeography</td>
<td>2</td>
</tr>
<tr>
<td>651</td>
<td>Dynamics of Marine Productivity</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(same as Ocean 651)</td>
<td></td>
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<tr>
<td>662</td>
<td>Advanced Taxonomy</td>
<td>3</td>
</tr>
<tr>
<td>665</td>
<td>Nomenclature Seminar</td>
<td>2</td>
</tr>
<tr>
<td>670-671</td>
<td>Advanced Physiology (3-5)</td>
<td></td>
</tr>
<tr>
<td>672</td>
<td>Techniques in Physiology</td>
<td>2</td>
</tr>
<tr>
<td>673</td>
<td>Techniques in Physiology—Biochemistry</td>
<td>2</td>
</tr>
<tr>
<td>675</td>
<td>Physiology Seminar</td>
<td>1</td>
</tr>
<tr>
<td>681</td>
<td>Phycology—Chlorophyta</td>
<td>2</td>
</tr>
<tr>
<td>682</td>
<td>Phycology—Phytoplankton</td>
<td>2</td>
</tr>
<tr>
<td>683</td>
<td>Phycology—Myxophyta and Phaeophyta</td>
<td>2</td>
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<tr>
<td>684</td>
<td>Phycology—Rhodophyta</td>
<td>2</td>
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<td>689</td>
<td>Directed Research (arr.)</td>
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<tr>
<td>789</td>
<td>Directed Research (arr.)</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
<td></td>
</tr>
</tbody>
</table>

**Business Administration**

GRADUATE FACULTY

P. M. Pratt, Ph.D. (Chairman)—marketing
J. Adler, Ph.D.—accounting, finance
L. W. Ascher, Ph.D.—finance
J. K. Bailey, Ph.D.—management
E. M. Barnett, Ph.D.—management, marketing, travel industry management
D. W. Bell, B.S.—real estate, land economics
R. B. Buchele, Ph.D.—management
P. N. H. Chung, Ph.D.—business economics, statistics
C. F. Congdon, M.B.A.—statistics
D. A. Corbin, Ph.D.—accounting, finance
F. B. Evans, Ph.D.—marketing
J. B. Ferguson, Ph.D.—personnel management, industrial relations
T. Q. Gilson, Ph.D.—management, industrial relations
H. W. Grayson, Ph.D.—business economics
A. L. Kirkpatrick, M.A.—business economics, money and banking
K. Lau, LL.M.—business law, finance
S. S. O. Lee, Ph.D.—accounting
Y. S. Leong, Ph.D.—public finance, statistics
K. W. Merriam, Ph.D.—accounting
F. J. Mueller, Ph.D.—accounting, finance
E. C. Pendleton, Ph.D.—labor economics, industrial relations
K. W. Pierson, M. A.—insurance
H. S. Roberts, Ph.D.—labor economics, industrial relations
N. E. Roos, D.B.A.—insurance
K. Sasaki, Ph.D.—statistics
K. K. Seo, Ph.D.—business economics, money and banking
C. H. Spencer, D.B.A.—accounting
M. H. Spencer, Ph.D.—business economics
**FIELDS OF STUDY**

H. B. Stellmacher, M.B.A.—marketing  
R. Taussig, Ph.D.—accounting, finance  
A. M. Whitehill, Ph.D.—international management

Intended candidates for the M.B.A. must have completed 24 semester hours of undergraduate credit in business administration and economics which must include at least one course in each of the following areas: accounting, business law (or legal environment of business), economics, finance, management, marketing, and statistics.

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

The M.B.A. is a 30-credit hour non-thesis program offered under Plan B of the Graduate Division.

**PROGRAM REQUIREMENTS:**

<table>
<thead>
<tr>
<th>Core courses</th>
<th>12 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives in Business Administration</td>
<td>12 hours*</td>
</tr>
<tr>
<td>non-Business electives</td>
<td>6 hours**</td>
</tr>
<tr>
<td><strong>Total credit hours required</strong></td>
<td>30 hours</td>
</tr>
</tbody>
</table>

The basic core courses consist of the seven courses listed in Group I and Group II. The candidate is required to complete two of the first group and two of the second group. The 12 credit hours of business electives may be selected from those courses listed in Group III and from those courses in Groups I and II which were not taken to meet the core requirement.

**GROUP I**

**ACCOUNTING**
600 Management Accounting (3)

**BUSINESS ANALYSIS AND STATISTICS**
600 Quantitative Analysis (3)

**BUSINESS ECONOMICS**
600 Managerial Economics (3)

**GROUP II**

**FINANCE**
600 Financial Problems (3)

**MANAGEMENT**
600 Management Problems (3)

**MARKETING**
600 Current Marketing Developments (3)

**PERSONNEL AND INDUSTRIAL RELATIONS**
600 Problems of Personnel Administration (3)

**GROUP III**

**ACCOUNTING**
605 Seminar in Accounting History and Theory (3)  
610 Seminar in Contemporary Accounting Theory (3)  
620 Seminar in Advanced Accounting (3)

*Not more than 9 credit hours may be taken in any one of the seven core areas—Acc, BAS, BEc, Fin, Mgt, Mkt, and PIR.*

**These may be undergraduate courses numbered 400-500.**
### Business Analysis and Statistics
- 610 Seminar in Statistical Decision Theory (3)
- 620 Seminar in Operations Research (3)
- 630 Seminar in Quantitative Methods of Business and Economic Forecasting (3)

### Business Economics
- 690 Seminar in Current Economic Problems (3)

### Insurance
- 600 Seminar in Insurance (3)

### Management
- 640 Seminar in Business Policy (3)

### Marketing
- 611 Seminar in Current Marketing Problems (3)

### Personnel and Industrial Relations
- 690 Seminar in Current Labor Problems (3)

### Real Estate
- 600 Seminar in Real Estate (3)

## Chemistry

### Graduate Faculty
- R. G. Inskeep, Ph.D. (Chairman) - infrared spectroscopy, hydrogen bonding, complex ions
- G. Andermann, Ph.D. - analytical chemistry, emission spectroscopy, X-ray spectroscopy, infrared reflectance studies
- I. L. Barnes, Ph.D. - analytical chemistry and geochemistry, age determination of minerals, chemistry of the solid state
- R. A. Duce, Ph.D. - nuclear and atmospheric chemistry, trace element analysis by neutron activation analysis
- M. M. Frodyma, Ph.D. - analytical chemistry, polarography, gas analysis
- J. W. Gilje, Ph.D. - inorganic chemistry, boron hydride chemistry, phosphorus and nitrogen chemistry
- J. L. Ihrig, Ph.D. - reaction mechanisms, free radicals, kinetics, magnetochemistry
- E. F. Kiefer, Ph.D. - reaction mechanisms, small ring compounds, olefin transition metal complexes
- H. O. Larson, Ph.D. - natural products, new synthetic methods, rearrangements
- J. A. Mann, Ph.D. - physical chemistry, theoretical chemistry, physics and chemistry of surfaces
- R. L. McDonald, Ph.D. - physical chemistry, solvent extraction of inorganic complexes, kinetics of isotopic exchange reactions
- J. J. Naughton, Ph.D. - analytical, physical, solid state and geochemistry
- L. L. Schaleger, Ph.D. - physical organic chemistry, kinetics and mechanism of acid catalyzed organic reactions, hydrolysis and hydration phenomena
- P. J. Scheuer, Ph.D. - organic chemistry, structure determination of natural products
- J. L. T. Waugh, Ph.D. - boron chemistry, intermetallic and heteropoly compounds, X-ray studies
- J. W. Wrathall, Ph.D. - inorganic chemistry, coordination compounds, reactions of coordinated ligands
- H. Zeitlin, Ph.D. - organic and oceanographic chemistry, reflectance spectrophotometry

### Affiliate Faculty
- G. E. Felton, Ph.D. - food technology, carbohydrate chemistry
- H. W. Hilton, Ph.D. - agricultural chemicals and carbohydrates
- R. W. Leeper, Ph.D. - organic synthesis
- C. E. Mumaw, Ph.D. - organic chemistry, food chemistry
- J. H. Payne, Ph.D. - carbohydrate chemistry, sugar technology
- H. Y. Young, M.S. - analytical chemistry

Intended candidates for the M.S. or Ph.D. must present the following minimum undergraduate preparation in chemistry: year courses in general, organic, analytical, and physical chemistry.
Courses may be selected from those listed below or from graduate offerings in mathematics and the natural sciences. Required courses are marked with an asterisk. Additional details of programs may be found in a departmental brochure.

**CHEMISTRY**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>445</td>
<td>Modern Synthetic Methods (4)</td>
</tr>
<tr>
<td>524</td>
<td>Preparative Inorganic Chemistry (3)</td>
</tr>
<tr>
<td>621</td>
<td>Introductory Quantum Chemistry (3)</td>
</tr>
<tr>
<td>622</td>
<td>Advanced Inorganic Chemistry I (3)</td>
</tr>
<tr>
<td>623</td>
<td>Advanced Inorganic Chemistry II (3)</td>
</tr>
<tr>
<td>631</td>
<td>Instrumental Methods of Analysis (4)</td>
</tr>
<tr>
<td>632</td>
<td>Electroanalytical Chemistry (3)</td>
</tr>
<tr>
<td>633</td>
<td>Analytical Applications of Spectroscopy (3)</td>
</tr>
<tr>
<td>634</td>
<td>Advanced Analytical Laboratory (2)</td>
</tr>
<tr>
<td>641</td>
<td>Advanced Organic Chemistry: Structure and Stereochemistry (3)</td>
</tr>
<tr>
<td>642</td>
<td>Advanced Organic Chemistry: Mechanisms (3)</td>
</tr>
<tr>
<td>651-652</td>
<td>Intermediate Physical Chemistry (3-3)</td>
</tr>
<tr>
<td>654</td>
<td>Radiochemistry and Nuclear Reactions (3)</td>
</tr>
<tr>
<td>656</td>
<td>Radiochemical Techniques (3)</td>
</tr>
<tr>
<td>691-692</td>
<td>Seminar (1-1)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research (arr.)</td>
</tr>
<tr>
<td>721-722</td>
<td>Special Topics in Inorganic Chemistry (arr.)</td>
</tr>
<tr>
<td>731-732</td>
<td>Special Topics in Analytical Chemistry (arr.)</td>
</tr>
<tr>
<td>741-742</td>
<td>Special Topics in Organic Chemistry (arr.)</td>
</tr>
<tr>
<td>744</td>
<td>Organic Applications of Spectroscopy (3)</td>
</tr>
<tr>
<td>751-752</td>
<td>Special Topics in Physical Chemistry (arr.)</td>
</tr>
<tr>
<td>753</td>
<td>Modern Theories of Atomic and Molecular Structure (3)</td>
</tr>
<tr>
<td>756</td>
<td>Statistical Mechanics (3)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
</tr>
</tbody>
</table>

### Chinese

**GRADUATE FACULTY**

- L. P. H. Winters, M.A. (Chairman)—traditional and modern literature; philosophy in literature; literature and culture
- Y. Shen, Ed.D.—theoretical and applied linguistics; acoustic phonetics
- J. Young, Ph.D.—applied linguistics and history

Both Plan A (thesis) and Plan B (non-thesis) M.A. programs in one of the following three major fields are available: (1) literature, (2) language, and (3) teaching of Chinese as a second language (CHISL). Intended candidates must have a B.A. in Chinese or have had equivalent preparation in the discipline.

Under Plan A, a minimum of 18 semester hours of course work in the major field, 6 semester hours of course work in the related field and 6 semester hours of thesis research is required.

Under Plan B, a minimum of 24 semester hours of course work in the major field and 6 semester hours of course work in the related field is required.

No more than 6 credits from courses numbered below 600 may be applied toward satisfaction of the requirement under either Plan A or Plan B. In addition, a reading knowledge of another language approved by the graduate faculty is required.
Civil Engineering

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

Under Plan A the program may include a maximum of 6 credits of approved courses in fields other than civil engineering. At least two graduate seminars are required.

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

**CIVIL ENGINEERING**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>621</td>
<td>Advanced Fluid Mechanics I (3)</td>
</tr>
<tr>
<td>622</td>
<td>Advanced Fluid Mechanics II (3)</td>
</tr>
<tr>
<td>623</td>
<td>Ground Water Hydrology (3)</td>
</tr>
</tbody>
</table>
FIELDS OF STUDY

624  Flow in Porous Media (3)
625  Ocean Engineering (3)
626  Coastal and Harbor Engineering (3)
651  Advanced Soil Mechanics I (3)
652  Advanced Soil Mechanics II (3)
671  Theory of Elasticity (3)
674  Theory of Elastic Stability (3)
675  Theory of Vibrations (3)
676  Structural Dynamics (3)
678  Theory of Plates (3)
679  Theory of Thin Shells (3)
681  Advanced Indeterminate Structures (3)
682  Numerical Methods of Stress Analysis (3)
683  Advanced Reinforced Concrete Design I (3)
684  Advanced Reinforced Concrete Design II (3)
685  Advanced Design of Metal Structures (3)
697  Seminar in Civil Engineering (1)
698  Seminar in Civil Engineering (1)
699  Directed Research (arr.)
800  Thesis Research (arr.)

SPECIAL PROGRAM IN ENVIRONMENTAL AND SANITARY ENGINEERING

In addition to the regular graduate faculty in engineering the following are utilized in this program.

N. C. Burbank, Sc.D. (Program Advisor)—environmental engineering theory and science (microbiology and chemistry)
R. K. C. Lee, M.D., Dr. P.H.—public health administration
R. M. Worth, M.D., M.P.H., Ph.D.—epidemiology
A. Q. Y. Tom, Sc.D.—environmental engineering theory and design (affiliate graduate faculty)

Administered with the close cooperation of the department of public health, the program is intended for candidates with a B.S. in engineering who meet the Graduate Division admission qualifications. Plan A (thesis program) is highly recommended for this program of study although in exceptional cases Plan B (non-thesis) may be permitted. Suggested electives are Public Health 601–602, 610, 625, 636–637, 651, 710; Chemistry 441, 580, 655, 656; Zoology 401, 425, 620, 621, 629, 645; Microbiology 415, 620, 625, 631, 632, 655; Civil Engineering 621, 622, 624, 651, 652.

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

CIVIL ENGINEERING

623  Ground Water Hydrology (3)
631  †ESE Theory I (3)
632  ESE Theory II (3)
633  ESE Design I (3)
634  ESE Design II (3)
*635  ESE Chemistry (4)
*636  ESE Microbiology (4)
637  ESE Laboratory (3)

†Environmental and Sanitary Engineering
GRADUATE FACULTY

E. Ernst, Ph.D. (Chairman) — Oriental theatre
L. Bentley, M.A. — acting
E. Langhans, Ph.D. — theatre history
R. Mason, M.F.A. — design
J. Trapido, Ph.D. — direction

Drama and Theatre

Intended candidates for an advanced degree in drama and theatre should present an adequate undergraduate background in the humanities, preferably in English, other languages and literatures, art and music, and in theatre or speech. Deficiencies in undergraduate preparation must be made up without credit. Intended candidates must submit official scores from the general portion of the Graduate Record Examination.

Two degrees are offered: the master of arts and the master of fine arts. Both Plan A and Plan B programs for the M.A. are offered. For the M.A. thesis the candidate does research with documentary materials in theatre history, criticism, or theory. The M.F.A. thesis involves creative work in one of two areas: play production or playwriting. For the production thesis, the student designs and directs a play of demonstrable historical and/or literary importance and gives a complete account of the production in a production script. For the playwriting thesis the candidate writes a full-length play.

Candidates are required to have a reading knowledge of a foreign language and to pass a comprehensive examination prior to the final examination on the thesis.

Courses available for the graduate program are listed below. However, candidates having sufficient undergraduate preparation may also take advanced courses in other departments, for example, literature and dramatic literature courses in English, or in European and Asian languages, and selected courses in anthropology, art, music, psychology, philosophy. All candidates are required to take Drama and Theatre 710, 6 credits from 620, 630, 635, or 640, and 3 from 660 or 670. Besides work in course, candidates are required to participate in the production of at least three plays.

East-West Center grantees from the United States must attain proficiency in an Oriental language.

Drama and Theatre

405 Puppetry (3)
410 Creative Dramatics (3)
415 Playwriting (3)
420 Acting (3)
ECONOMICS

410  Asian Economic Development (3)
416  Economic Development of Europe (3)
417  Economic Development of U.S. (3)
420-421 Quantitative Methods in Economic Analysis (3-3)
430  Comparative Economic Systems (3)
450  Public Finance (3)
452  Subnational Finance (3)
460  International Trade and Finance (3)
462  International Economic Policy (3)
470  Government and Business (3)

Applicants should have 24 credits in undergraduate economics, including principles (6); money and banking (3); intermediate economic theory, micro (3) and macro (3); and statistics (3). Knowledge of calculus is strongly recommended.

Economics 600 and 602 are required. Candidates must pass a written and oral comprehensive examination covering three fields of economics-economic theory, and two selected from: economic development, quantitative analysis, monetary economics, public finance, and international economics, or an approved outside field. A maximum of 6 semester credits in outside fields is allowed in Plan A and 9 in Plan B.
GRADUATE FACULTY

J. B. Crosley, Ed.D. (Chairman) — administration of intermediate, secondary, junior college, higher education, and administrative leadership
H. V. Everly, Ph.D. — general school administration
L. D. Jackson, Ed.D. — school law, school business, school publicity
R. W. Johnson, Ed.D. — administrative organization, school plant
J. R. Marks, Ed.D. — research, supervision, and administration of the elementary schools

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

Admission to candidacy is based upon (1) the quality of the student’s undergraduate and graduate record; (2) his performance on the Graduate Record Examination and the Miller Analogies Test; and (3) successful completion of EA 685.

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

Selection of specific courses in the above fields will be by the program committee of the candidate.
FIELDS OF STUDY

EDUCATIONAL ADMINISTRATION

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>Theory of Administration</td>
<td>3</td>
</tr>
<tr>
<td>670</td>
<td>Supervision of Instruction</td>
<td>3</td>
</tr>
<tr>
<td>671</td>
<td>School Public Relations</td>
<td>3</td>
</tr>
<tr>
<td>680</td>
<td>Public School Organization</td>
<td>2</td>
</tr>
<tr>
<td>685</td>
<td>Principles of Educational Administration</td>
<td>3</td>
</tr>
<tr>
<td>689</td>
<td>The School Plant</td>
<td>3</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research</td>
<td>arr.</td>
</tr>
<tr>
<td>768</td>
<td>Research Seminar in Educational Administration</td>
<td>3</td>
</tr>
<tr>
<td>770</td>
<td>Seminar in Supervision of Instruction</td>
<td>3</td>
</tr>
<tr>
<td>780</td>
<td>Seminar in Educational Administration</td>
<td>3</td>
</tr>
<tr>
<td>782</td>
<td>Legal Aspects of School Administration</td>
<td>5</td>
</tr>
<tr>
<td>784</td>
<td>Financial Aspects of School Administration</td>
<td>3</td>
</tr>
<tr>
<td>785</td>
<td>Seminar and Internship in Administrative Leadership</td>
<td>2-4</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research</td>
<td>arr.</td>
</tr>
</tbody>
</table>

Educational Foundations

GRADUATE FACULTY

F. G. Austin, Ph.D. (Chairman) — history, philosophy, social foundations
S. Amioka, Ph.D. — philosophy, Japanese education
R. S. Anderson, Ph.D. — comparative education
W. H. Boyer, Ed.D. — philosophy, social foundations
R. W. Clopton, Ph.D. — history, philosophy
A. Keppel, Ph.D. — history, philosophy
R. E. Potter, Ed.D. — history, social foundations

The purpose of the master's degree program in educational foundations is to develop educational leaders capable of critical analysis of alternatives in educational policy and practice through the study of the interconnections between educational theory and the academic fields of philosophy, history, and the social sciences.

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

Admission to candidacy is based upon (1) the quality of the student's undergraduate record, (2) his scores on certain standardized examinations, and (3) his performance on the general examination.

Both Plan A (thesis) and Plan B (non-thesis) are available.

Plan A: The program may include a maximum of 10 semester credits in approved courses other than educational foundations, which are related to the candidate's announced goals.

Plan B: The program normally includes 18 semester hours of education, of which 12 are in the department of educational foundations, and 12 semester hours in a planned and approved sequence of courses which carry graduate credit in other fields.

In both Plan A and Plan B, courses in fields of study other than educational foundations will normally be concentrated in one or two of the following: philosophy, history, economics, political science, sociology, anthropology, Asian studies, American studies, or another graduate field in education.
Graduate courses in educational foundations not listed below, but which are offered in summer sessions or during the year by visiting professors, may be included in degree programs with the approval of the chairman.

A candidate must take Ed EP 672, Ed EP 708, and at least two of the Ed EF courses marked with asterisks. Plan B candidates will take Ed EF 768 in their terminal semester or summer session.

**EDUCATIONAL FOUNDATIONS**

- **650** History of Education (3)
- **651** History of American Education (3)
- **660** Philosophy of Education (3)
- **670** Comparative Education: Europe and America (3)
- **671** Comparative Education: The Orient (3)
- **672** Education and the World Community (3)
- **681** The Church and the School (2)
- **683** Social Foundations of Education (3)
- **684** Interpersonal Relationships in Education (3)
- **685** Education in America (3)
- **699** Directed Research (arr.)
- **751** History of American Education (3)
- **757** Educational Classics (2)
- **763** Seminar in Educational Theory (2)
  1. Educational issues
  2. John Dewey
  3. Contemporary Educational Philosophers
  4. Japanese Educational Philosophy
  5. History of Education
- **765** Comparative Ideologies and Education (3)
- **768** Seminar in Problems in Education (2)
- **770** Seminar in Comparative Education (2)

**Educational Psychology**

**GRADUATE FACULTY**

- D. R. Collins, Ed.D. (Chairman) — counseling and guidance
- D. C. Atkin, Ph.D. — measurement, research
- R. S. Alm, Ph.D. — diagnosis and remedial instruction
- W. F. Char, M.D. — child psychiatry, special education
- F. E. Clark, Ed.D. — counseling and guidance
- G. A. Fargo, Ph.D. — special education
- G. Y. Fujita, Ph.D. — statistics, research
- D. A. Leton, Ph.D. — school psychology
- T. A. McIntosh, Ed.D. — special education, guidance
- A. M. Niwakawa, Ph.D. — social psychology, psycholinguistics
- D. G. Ryans, Ph.D. — measurement, research
- G. Sax, Ph.D. — measurement, research
- W. A. Wittich, Ph.D. — audio-visual

**AFFILIATE FACULTY**

- T. M. C. Chang, Ph.D. — educational psychology

Intended candidates for the M.Ed. in educational psychology must present a minimum of 18 semester hours in professional education courses. As a part of the undergraduate preparation, students will have completed a minimum of 12 hours of work in psychology or educational psychology including work in developmental psychology, educational psychology, and test and measurements. Students should plan on meeting proficiency in statistics prerequisite for Educational Research Methods (EP 708).
Admission to candidacy is based upon (1) the quality of the student's undergraduate record and (2) his performance on the general examination. The results of the Aptitude Test of the Graduate Record Examination and the Miller Analogies Test must be submitted to the chairman at the time the student plans on entering the M.Ed. program. The graduate faculty may waive the requirement for the MAT provided that both the Aptitude and Area Tests of the Graduate Record Examination are submitted.

Areas of study offered: educational communications, counseling and guidance, remedial and diagnostic techniques, special education, and the general field of educational psychology (learning, developmental, measurement, and research methods). The programs in counseling and guidance and special education meet the certification requirements of the Hawaii State Department of Education; the program in remedial and diagnostic techniques meets the recommendations of the International Reading Association.

In Plan A, the program may include a maximum of 10 semester hours in approved courses other than educational psychology which are related to the candidate's announced goals. At least one graduate seminar in educational psychology is required. A minimum of 4 units in philosophy of education and history of education is required.

In Plan B, the program must include a minimum of 30 hours in a planned and approved sequence of courses, 18 of which will normally be in educational psychology. A minimum of six hours of graduate work shall be taken in fields of study other than educational psychology. Ordinarily, the related field of study shall be in the behavioral sciences. At least one graduate seminar in educational psychology is required. A minimum of 4 units in philosophy of education and history of education is required.

EDUCATIONAL PSYCHOLOGY

404 Education of Exceptional Children (3)
405 The Mentally Retarded (3)
406 Curriculum Development for Mentally Retarded Children (3)
407 Education of the Mentally Retarded (3)
408 The Emotionally Disturbed Child (3)
409 Culturally and Economically Disadvantaged Pupil (3)
415 Clinical Assessment of Exceptional Children (3)
450 Practicum Experience with the Mentally Retarded (9)
451 Practicum for Teachers of Emotionally Disturbed Children (9)
507 Remedial Reading (3)
514 Audio-Visual Media (3)
601 Guidance in the School (3)
602 Elementary School Guidance (3)
604 Occupational Information in Guidance (3)
605 Problems of School Adjustment (3)
607 Clinical Procedures in Reading (3)
609 Tests and Inventories in Guidance (3)
614 Education of Gifted Children (3)
616 Seminar in Education of Mentally Retarded (3)
629 Educational Statistics (3)
Television in Education (3)
Advanced Educational Psychology: Learning (3)
Advanced Educational Psychology: Psycho-Social Development (3)
Directed Research (arr.)
Seminar in Guidance (3)
Group Guidance (3)
Guidance Practicum (3)
Seminar in Audio-Visual Education (3)
Production of Audio-Visual Materials (3)
Educational Research Methods (3)
Advanced Problems of Educational Measurement and Evaluation (3)
Organization of New Media Programs (3)
Seminar in Educational Psychology (3)
Thesis Research (arr.)

Electrical Engineering

GRADUATE FACULTY
W. W. Peterson, Ph.D. (Chairman) — information theory
A. V. Chow, M.S. — communication theory
E. Gott, D. Eng. — circuit theory and signal processing systems
B. S. M. Granborg, Ph.D. — automatic control
K. Najita, M.S. — applied mathematics and microwave devices
T. H. Ruelofs, Ph.D. — radio wave propagation
P. F. Weaver, Ph.D. — radio science
P. C. Yuen, Ph.D. — microwaves, radio science

Intended candidates for the M.S. in electrical engineering must present the B.S. in electrical engineering or the equivalent. Both Plan A and Plan B are available. Choice of plan is required before 15 credits of graduate work applicable to the degree have been completed.

Plan A may include a maximum of 6 credits of approved courses in departments other than electrical engineering. At least two graduate seminars are required.

Plan B requires 30 credits of graduate study. It normally includes 21 credits in electrical engineering courses and 9 credits (and not less than 6 credits) in approved courses in mathematics and physics.

Attendance at graduate seminars is required, and each graduate student must make one seminar presentation before completion of his program.

ELECTRICAL ENGINEERING

601-602 Electromagnetic Theory and Applications (3-3)
603 Active Network Analysis (3)
604 Magneto-Ionic Theory (3)
605-606 Network Synthesis (3-3)
607 Energy-State Devices (3)
608 Analysis of Non-linear Systems (3)
621-622 Advanced Microwave Theory (3-3)
631 Advanced Electronic Instrumentation (3)
641 Statistical Communication Theory (3)
651 Advanced Feedback Control Systems (3)
652 Optimization Techniques in Control Systems (3)
655 Sampled-Data Control Systems (3)
657 Hybrid Automatic Control Systems (3)
661 Theory and Design of Digital Machines (3)
663 Information Theory (3)
665 Signals and Random Noise (3)
672 Magnetohydrodynamics (3)
Elementary Education

GRADUATE FACULTY

M. R. Porter, Ph.D. (Chairman)—elementary education, curriculum for elementary schools
A. B. Carr, Ed.D.—science education for elementary schools
M. Ezer, Ed.D.—language arts, reading, social studies, curriculum for elementary schools
E. D. Hayes, Ph.D.—language arts, reading, creative expression in elementary education
A. L. Pickens, Ed.D.—art education

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. Before completion of the M.Ed. degree, evidence must be presented of successful teaching experience beyond student teaching. This requirement may be met by a full semester of supervised internship.

Admission to candidacy is based upon (1) the quality of the student's undergraduate record, (2) his performance on the Graduate Record Examination, and (3) an interview with the graduate faculty.

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

Plan B: minimum of 36 semester hours, 21–27 in foundation courses, research, and elementary education, and 9–15 semester hours in a planned and approved sequence of elective courses which carry graduate credit in fields of study other than elementary education. It is designed to enable teachers to develop depth and creativity in a teacher's role. Elementary Education 722 is required.

Nine credits in history and philosophy of education and educational psychology (including EP 708) are required of all candidates.

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

CURRICULUM AND INSTRUCTION

620 Teaching Reading in the Elementary School (2)
621 Modern Language Arts Program, Elementary (2)
*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)
667 Curriculum Trends in Early Childhood Education (3)
699 Directed Research (arr.)
722 Seminar in Elementary Curriculum Foundations (3)
800 Thesis Research (arr.)
English

GRADUATE FACULTY
C. S. Bouslog, Ph.D. (Chairman)—English romanticism, 20th century British and American literature
J. M. Backus, Ph.D.—American literature
D. S. Brown, Ph.D.—American literature
A. G. Day, Ph.D.—American literature, writing, Pacific literature; comparative literature
J. W. Frierson, Ph.D.—Victorian literature
T. H. Fujimura, Ph.D.—Restoration literature
W. T. Furniss, Ph.D.—Renaissance literature
D. George, Ph.D.—18th century literature
W. E. Humble, M.A.—writing
H. M. Hurwitz, Ph.D.—American literature, comparative literature
B. F. Kirtley, Ph.D.—comparative literature, folklore, Pacific literature
A. I. Korn, M.A.—Milton, 17th century poetry, British novel, Hawaiian history
A. P. Leib, Ph.D.—American literature, medieval literature
A. J. Levy, Ph.D.—American literature
J. K. Lovers, Ph.D.—Elizabethan literature
S. Lutsky, Ph.D.—American literature and social backgrounds
D. Stempel, Ph.D.—19th century literature, linguistics, criticism
B. M. Stillman, Ph.D.—English romanticism, American literature
C. G. Stouden, Ph.D.—American literature, Pacific literature
T. L. Summersgill, Ph.D.—Elizabethan literature, Chaucer
T. F. Teevan, Ph.D.—modern English and Irish literature
L. Wellin, Ph.D.—comparative literature, Old and Middle English
W. Wilson, Ph.D.—drama, playwriting
L. E. Winters, Ph.D.—comparative literature, Chinese and American literature

Intended candidates for the M.A. are expected to present, in addition to the customary freshman and sophomore composition and literature survey courses, 21 semester hours of undergraduate credit in English or closely related subjects, including advanced exposition, Shakespeare, English literature, and American literature. In addition, courses in English and American history and in classical and European literature are desirable. A reading knowledge of an ancient or modern European language is required. Courses for the graduate program are to be selected from the list below; however, a number of advanced courses in other disciplines may be approved as part of a program. Required courses are marked with an asterisk; English 780 or 785 is required, not both.

Both Plan A and Plan B are available.

Applicants for admission to graduate study in English must submit official scores from the general and advanced literature portions of the Graduate Record Examination.

ENGLISH

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>425</td>
<td>Modern English Grammar (3)</td>
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<tr>
<td>440</td>
<td>English Drama to 1642 (3)</td>
</tr>
<tr>
<td>443-444</td>
<td>Modern Dramatic Literature (3-3)</td>
</tr>
<tr>
<td>447</td>
<td>The English Novel to 1892 (3)</td>
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<tr>
<td>448</td>
<td>The English Novel, 1892-1900 (3)</td>
</tr>
<tr>
<td>451</td>
<td>Medieval English Literature (3)</td>
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<tr>
<td>452</td>
<td>Chaucer (3)</td>
</tr>
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</table>
Fields of Study

455 Sixteenth-Century English Literature (3)
457-458 Shakespeare (3-3)
460 Early Seventeenth-Century English Literature (3)
465 Restoration Literature (3)
466 Milton (3)
470 Early Eighteenth-Century English Literature (3)
471 Late Eighteenth-Century English Literature (3)
480 The Romantic Movement in England (3)
485-486 Victorian Literature (3-3)
490 Twentieth-Century British Novel (3)
571-572 American Literature (3-3)
573 American Literature and Cultural History (3)
585 Literature of the Pacific (3)
590 Twentieth-Century American Novel (3)
592 Twentieth-Century British and American Poetry (3)
620 Seminar in Teaching Composition (3)
621 Teaching College Composition (3)
625 History of the English Language (3)
630 Seminar in Research Methods (3)
635 Seminar in Comparative Literature (3)
636 History of Literary Criticism (3)
640 Old English (3)
657 Seminar in Shakespeare (3)
660 Major Authors (3)
675 Literary Genres and Problems (3)
685 Seminar in English Literature (3)
699 Directed Research (arr.)
780 Seminar in American Literature: Authors (3)
785 Seminar in American Literature: Problems, Periods (3)
800 Thesis Research (arr.)

Entomology

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

Affiliate Faculty
J. L. Gressitt, Ph.D. — taxonomy
C. R. Joyce, Ph.D. — medical entomology
I. Keiser, B.S. — fruit flies
L. C. Quate, Ph.D. — taxonomy
K. Sakimura, B.S. — pineapple insects
L. F. Steiner, M.S. — fruit flies
N. Wilson, Ph.D. — acarology
C. Yoshimoto, Ph.D. — hymenoptera

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, and genetics. Deficiencies in undergraduate preparation must be made up.

Courses available for graduate credit are listed below. Courses in the fields of zoology, botany, microbiology, and genetics may be allowed in the degree program. Required courses are marked with an asterisk.

**ENTOMOLOGY**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>661</td>
<td>Medical and Veterinary Entomology</td>
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<tr>
<td>662</td>
<td>Advanced Systematic Entomology</td>
<td>(3)</td>
</tr>
<tr>
<td>663</td>
<td>Scale Insects</td>
<td>(3)</td>
</tr>
<tr>
<td>664</td>
<td>Immature Insects</td>
<td>(3)</td>
</tr>
<tr>
<td>671</td>
<td>Insect Ecology</td>
<td>(3)</td>
</tr>
<tr>
<td>672</td>
<td>Acarology</td>
<td>(3)</td>
</tr>
<tr>
<td>673</td>
<td>Insect Pathology</td>
<td>(3)</td>
</tr>
<tr>
<td>675</td>
<td>Biological Control of Pests</td>
<td>(3)</td>
</tr>
<tr>
<td>680</td>
<td>Insect Toxicology</td>
<td>(4)</td>
</tr>
<tr>
<td>686</td>
<td>Insect Transmitted Diseases of Plants</td>
<td>(3)</td>
</tr>
<tr>
<td>697</td>
<td>Entomology Seminar</td>
<td>(1)</td>
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<tr>
<td>699</td>
<td>Directed Research (arr.)</td>
<td></td>
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<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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**ZOOLOGY**

<table>
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<th>Title</th>
<th>Credits</th>
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</thead>
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<tr>
<td>*601</td>
<td>Zoological Literature</td>
<td>(1)</td>
</tr>
<tr>
<td>*602</td>
<td>Preparation of Scientific Manuscripts</td>
<td>(1)</td>
</tr>
</tbody>
</table>

### Food Science

**GRADUATE FACULTY**

E. Ross, Ph.D. (Chairman) —food science and technology
H. A. Frank, Ph.D.—food science, food microbiology
H. Y. Yamamoto, Ph.D.—food science, food biochemistry

**AFFILIATE FACULTY**

G. G. Dull, Ph.D.—natural products, plant biochemistry
G. E. Felton, Ph.D.—food technology, carbohydrate chemistry
J. H. Payne, Ph.D.—sugar technology

Intended candidates for the M.S. must present a minimum undergraduate preparation of two and a half years of chemistry, including at least a semester each of analytical and organic chemistry, one year of general physics, credits in agricultural and biological sciences, including general microbiology, and college algebra and trigonometry.

Courses for the graduate program are to be selected from those offered in the major field of food science, and the related fields of agricultural engineering, chemistry, biochemistry and biophysics, microbiology, and nutrition. A maximum of 6 credits may be earned in other fields. Required courses are marked with an asterisk.

**FOOD SCIENCE**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>510</td>
<td>Principles of Tropical Food Processing and Preservation</td>
<td>(3)</td>
</tr>
<tr>
<td>511</td>
<td>Chemistry and Technology of Tropical Food Products</td>
<td>(2)</td>
</tr>
<tr>
<td>601</td>
<td>Principles in Food Science and Technology</td>
<td>(3)</td>
</tr>
<tr>
<td>603</td>
<td>Microbiology of Foods</td>
<td>(3)</td>
</tr>
<tr>
<td>604</td>
<td>Laboratory Methods for Food Microbiology</td>
<td>(2)</td>
</tr>
<tr>
<td>*620</td>
<td>Seminar (1)</td>
<td></td>
</tr>
<tr>
<td>630</td>
<td>Biochemical and Chemical Aspects of Foods</td>
<td>(3)</td>
</tr>
<tr>
<td>*699</td>
<td>Directed Research (arr.)</td>
<td></td>
</tr>
<tr>
<td>*701</td>
<td>Recent Advances in Food Research</td>
<td>(1)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
<td></td>
</tr>
</tbody>
</table>
French

GRADUATE FACULTY
D. B. Aspinwall, Ph.D. (Chairman) — literature of 19th and 20th centuries
J. Holton, Ph.D. — methods of teaching the language
E. Jackson, Ph.D. — Renaissance and 18th century literature
E. Knowlton, Ph.D. — history of the language
A. Moore, B.A. — Franco-German literary relations in 18th and 19th centuries

Intended candidates for the M.A. in French must present 24 semester hours of undergraduate credit in French, exclusive of introductory and intermediate courses, or have had equivalent preparation. They must also demonstrate, by means of a personal interview or by a tape recording, that they possess the ability to communicate orally in French with a French national.

Under Plan A at least 6 semester hours of European history, taken as undergraduate or as graduate work are required. Some knowledge of Latin is desirable and a competence in a second foreign language is required. For the latter requirement the standard for a European language is the equivalent of that expected upon completion of the second year of University study in the language. A maximum of 8 semester hours may be elected from courses in related fields. Required courses are marked with an asterisk.

FRENCH
- 411-412 Literature of the Golden Age (3-3)
- 413-414 Eighteenth-Century Literature (2-2)
- 415-416 Nineteenth-Century Literature (2-2)
- 417-418 Twentieth-Century Literature (3-3)
- 601 Seminar in Modern French Literature (2)
- 602 French Poetry from the Renaissance to the Present (3)
- 609 Literature of Renaissance (3)
- 660 Advanced Composition and Stylistics (2)
- 671 History of the French Language (2)
- 672 Medieval Literature (2)
- 699 Directed Research (arr.)
- 800 Thesis Research (arr.)

EUROPEAN LANGUAGES
- 630 Seminar in Research Methods (2)

Genetics

GRADUATE FACULTY
G. C. Ashton, Ph.D. (Chairman) — genetic polymorphisms
J. A. Hunt, Ph.D. — biochemical genetics
M. P. Mi, Ph.D. — statistical genetics
N. E. Morton, Ph.D. — human population genetics

AFFILIATE FACULTY
K. Fujino, Ph.D. — immunogenetics
S. L. Halperin, Ph.D. — genetical psychology
J. B. Smith, Ph.D. — cytogenetics
L. M. Sprague, Ph.D. — immunogenetics
S. H. Waxman, M.D. — cytogenetics
M. Yokoyama, M.D., Ph.D. — immunogenetics

The M.S. and Ph.D. in genetics are offered in human genetics, biochemical genetics, immunogenetics, plant genetics (see Horticulture) and
quantitative genetics (see Animal Science). Intended candidates must have or acquire adequate preparation in biology, biometrics, chemistry through organic chemistry, calculus, genetics, and physics. For human genetics an additional undergraduate requirement is anthropology. For immunogenetics, the undergraduate preparation should include general microbiology. For quantitative animal genetics, the preparation should include vertebrate zoology and physiology. For plant genetics the undergraduate requirements include cytology, plant anatomy, taxonomy, and physiology. The Graduate Record Examination and two letters of recommendation are required of all applicants.

All candidates for the graduate degree in genetics must take Genetics 518, 618, 650, 4 semesters of 654, Biochemistry 561–562, and any additional courses specified by the thesis committee. Related fields in which credit will normally be allowed toward the degrees in genetics include animal science, anthropology, botany, biochemistry, chemistry, horticulture, mathematics, medicine, microbiology, public health, and zoology.

<table>
<thead>
<tr>
<th>GENETICS</th>
<th></th>
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<tbody>
<tr>
<td>518</td>
<td>Biochemical Genetics</td>
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<tr>
<td>618</td>
<td>Cytogenetics</td>
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<tr>
<td>625</td>
<td>Advanced Topics in Genetics</td>
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<tr>
<td>650</td>
<td>Population Genetics</td>
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<tr>
<td>651</td>
<td>Seminar</td>
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<tr>
<td>699</td>
<td>Directed Research</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research</td>
</tr>
</tbody>
</table>

**Geography**

**GRADUATE FACULTY**

R. J. Fuchs, Ph.D. (Chairman)—urban and economic geography, Soviet Union  
T. W. Beed, Ph.D.—urban and economic geography, quantitative methods, Australia  
N. M. Bowers, Ph.D.—South Asia, Micronesia  
J. H. Chang, Ph.D.—climatology, agricultural geography, China  
D. W. Frycr, Ph.D.—economic geography, economic development, Southeast Asia  
C. A. Manchester, Jr., Ph.D.—Japan, history of geography, historical geography  
P. N. D. Piric, Ph.D.—population geography, Pacific  
F. R. Pitts, Ph.D.—cultural geography, East Asia, computer applications  
J. M. Street, Ph.D.—agricultural and physical geography, tropical biogeography

Undergraduate background should include the courses required for a geography major. However, students with majors in related disciplines are welcomed with the understanding that they may be obliged to take some essential courses on a non-credit basis. The student is expected to have adequate preparation in mathematics or statistics and to have a reading knowledge of a foreign language. Applicants for the graduate program should arrange to have results of the Aptitude Test of the Graduate Record Examination sent to the chairman.

Courses available for the graduate program are listed below. Regulations on course and degree requirements are available from the department. Programs are individually arranged by the department to guarantee inclusion of basic content and methods courses and the beginnings of
specialization in a systematic field and a regional field. Ordinarily, the bulk of a student's program will be made up of systematic and methods courses within the department, and an integrated group of courses selected from other disciplines in physical and social sciences.

**Systematic and Methods**

**GEOGRAPHY**
- 410 Physical Geography (3)
- 420 Introduction to Climatology (3)
- 421 Advanced Climatology (3)
- 430 Cartography (3)
- 450 Urban Geography (3)
- 470 Population Geography (3)
- 507 Conservation and Utilization of Natural Resources (3)
- 580 Geography of the Tropics (3)
- 601 History of Geography (3)
- 605 Historical Geography (3)
- 620 Studies in Economic Geography (3)
- 630 Seminar in Climatology (3)
- 640 Quantitative Methods in Geography (3)
- 645 Field Methods (3)
- 680 Seminar in Geography (3)

**Regional**

**GEOGRAPHY**
- 501 Geography of United States and Canada (3)
- 526 Geography of the Soviet Union (3)
- 541 Geography of Asia (3)
- 552 Geography of Japan (3)
- 553 Geography of China (3)
- 555 Geography of South Asia (3)
- 556 Geography of Southeast Asia (3)
- 561 Geography of Australia and New Zealand (2)
- 571 Geography of the Pacific Islands (3)
- 578 Geography of Hawaii (3)
- 660 Seminar in Geography of Asia (3)
- 665 Seminar in Geography of the Pacific (3)

**Individual Research**

**GEOGRAPHY**
- 699 Directed Research (arr.)
- 800 Thesis Research (arr.)

**Geological Sciences**

**GRADUATE FACULTY**
- R. Moberly, Jr., Ph.D. (Chairman) —sedimentology, marine geology
- A. T. Abbott, Ph.D.—ore deposits, geomorphology
- W. M. Adams, Ph.D.—seismology, applied geophysics
- J. C. Belshe, Ph.D.—geomagnetism, marine geophysics
- D. C. Cox, M.A.—hydrology, ground-water and engineering geology
- A. S. Furumoto, Ph.D.—seismology, geophysics
- G. A. Macdonald, Ph.D.—volcanology, igneous petrology
- A. Malahoff, Ph.D.—geomagnetism, gravity
- M. Manghnani, Ph.D.—geochemistry, geophysics
- K. A. Pankiwskyj, Ph.D.—metamorphic geology, silicate phase petrology
- J. C. Rose, Ph.D.—gravity, marine geophysics
- C. W. Thomas, M.A., M.S.—paleontology, marine geology
- G. P. Woollard, Ph.D.—gravity, seismology, geomagnetism
Intended candidates for the M.S. and Ph.D. in the geological sciences will be accepted from undergraduate majors in the natural sciences, mathematics, and engineering. Students not having year-length courses in geology and geophysics, physics, chemistry, college mathematics, and geological or geophysical field methods will be obliged to take those courses without credit. The M.S. General Examination and the Ph.D. Comprehensive Examination may include basic questions from mineralogy, petrology, geochemistry, structure, stratigraphy, geomorphology, hydrology, geophysics, paleontology, chemistry, physics, and mathematics, and the entering student will be guided accordingly.

Plan B is available only to prospective teachers of earth science in secondary schools. One foreign language with useful scientific literature in the field of the candidate, usually French, German, or Russian, is required of M.S. candidates, and two such languages are required for the Ph.D.

Credit may be obtained in the courses listed below, and in related offerings of the natural sciences, mathematics, and engineering departments with the approval of the supervising committees.

### Geosciences

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>401-402</td>
<td>Petrology-Geochemistry</td>
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<tr>
<td>405-406</td>
<td>Dynamic Geology</td>
<td>(4-4)</td>
</tr>
<tr>
<td>410</td>
<td>Historical Geology</td>
<td>(3)</td>
</tr>
<tr>
<td>411</td>
<td>Paleontology</td>
<td>(3)</td>
</tr>
<tr>
<td>416</td>
<td>Geomorphology</td>
<td>(3)</td>
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<tr>
<td>420</td>
<td>Marine Geology</td>
<td>(3)</td>
</tr>
<tr>
<td>425</td>
<td>Geochemistry</td>
<td>(3)</td>
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<tr>
<td>426</td>
<td>Petrography</td>
<td>(3)</td>
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<tr>
<td>451</td>
<td>Seismology</td>
<td>(3)</td>
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<tr>
<td>460</td>
<td>Principles of Geophysics</td>
<td>(3)</td>
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<tr>
<td>461</td>
<td>Gravity and Goudesy</td>
<td>(3)</td>
</tr>
<tr>
<td>462</td>
<td>Geomagnetism, Geoelectricity, and the Thermal State of the Earth</td>
<td>(3)</td>
</tr>
<tr>
<td>463</td>
<td>Physical Properties of Earth Matter</td>
<td>(3)</td>
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<td>465-466</td>
<td>Geophysical Exploration</td>
<td>(3-3)</td>
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<td>601</td>
<td>Seminar in Volcanology</td>
<td>(2)</td>
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<td>602</td>
<td>Seminar in Igneous Petrology</td>
<td>(2)</td>
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<td>603</td>
<td>Phase Petrology</td>
<td>(3)</td>
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<td>604</td>
<td>Seminar in Metamorphic Geology</td>
<td>(2)</td>
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<td>605</td>
<td>Seminar in Engineering and Ground-Water Geology</td>
<td>(3)</td>
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<td>607</td>
<td>Seminar in Ore Deposits</td>
<td>(2)</td>
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<td>608</td>
<td>Ore Genesis</td>
<td>(3)</td>
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<td>609</td>
<td>Seminar in Geomorphology</td>
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<td>614</td>
<td>Advanced Field Study</td>
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<td>617</td>
<td>Seminar in Geotectonics: Continents</td>
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<td>618</td>
<td>Seminar in Geotectonics: Oceans</td>
<td>(3)</td>
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<tr>
<td>619-620</td>
<td>Sedimentology and Stratigraphy</td>
<td>(3-3)</td>
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<tr>
<td>624</td>
<td>Topics in Geochemistry</td>
<td>(3)</td>
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<td>625</td>
<td>Seminar in Current Research Topics</td>
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<tr>
<td>655</td>
<td>Seismic Source Mechanisms</td>
<td>(3)</td>
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<td>656</td>
<td>Seismic Propagation Phenomena</td>
<td>(3)</td>
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<td>657</td>
<td>Analysis and Synthesis of Seismograms</td>
<td>(3)</td>
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<tr>
<td>658</td>
<td>Seismometry and Seismological Model Study</td>
<td>(3)</td>
</tr>
</tbody>
</table>
German

Intended candidates must present a full undergraduate major in German or the equivalent. They must also demonstrate, by means of a personal interview or a tape recording, such fluency and accuracy in German as will insure successful participation in class discussion and research. They must also pass a proficiency test in a second European language.

The minimum requirement is 36 graduate credit hours. A maximum of 8 of the 36 hours may be elected from courses in related fields. Required courses are marked with an asterisk.

GERMAN

411-412 The Classical Period (3-3)
413-414 The Modern Period (3-3)
416 Renaissance and Baroque Literature (3)
417 The German Drama (3)
418 The Romantic Movement (3)
*601 History of the German Language (3)
602 Composition and Stylistics (3)
*615 Middle High German Masterpieces (3)
*693 Seminar in German Literature (5)

Four cycles, one of which is required: (a) Novel, 18th and 19th centuries; (b) Faust; (c) Lyric Poetry; (d) Novel, 20th century.

699 Directed Research (arr.)
800 Thesis Research (6)

EUROPEAN LANGUAGES

*630 Seminar in Research Methods (2)

History

GRADUATE FACULTY

H. F. Margulies, Ph.D. (Chairman) —United States political, the Progressive Era
G. Akita, Ph.D.—Far East, modern Japan
C. B. Cowing, Ph.D.—United States social and economic
W. A. Ernest, M.A.—Medieval Europe
Z. Gasiorowski, Ph.D.—Eastern and Central Europe
C. Hunter, Ph.D.—Hawaii, United States cultural
D. Johnson, Ph.D.—United States diplomatic, Latin America, United States in the Pacific
W. Johnson, Ph.D.—recent United States
D. W. Y. Kwok, Ph.D.—modern China, Chinese thought
H. J. Lamley, Ph.D.—modern China
W. H. Maurer, Ph.D.—ancient Near East, Greece and Rome
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.

Intended candidates for the M.A. degree may select either the Plan A (thesis) or the Plan B (non-thesis) program. Plan A requires a minimum of 24 semester hours of graduate course work (at least 15 must be in courses numbered 600 to 799, including History 711 and 712), and 6 semester hours of thesis research. Plan B requires a minimum of 30 hours of graduate course work (at least 18 in courses numbered 600 to 799, including History 711 and 712) and comprehensive examinations in two fields of history. Under both plans an intended candidate is required to give evidence of his competence in a foreign language appropriate to the area of his major interest. In some fields language competence is demonstrated by passing an examination in the language; in other fields, by completing or having completed 12 hours of college-level language study.

Intended candidates for the Ph.D. degree are expected to possess the M.A. degree in history or its equivalent. The Ph.D. candidate must demonstrate that he is capable of pursuing a successful career as a professional historian by showing initiative in historical research and by giving evidence of ability to present his findings both orally and in writing. He must prove his competence by passing examinations in two foreign languages appropriate to the area of his major interest, 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.

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 Ph.D. program is requested to supplement his application and transcript with (1) at least two letters of recommendation from professors with whom he has worked and (2) a sample of his research work, such as a seminar paper or master's thesis.
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.

**HISTORY**

### Asia

- 527 Russian Siberia and the Pacific
- 529-530 History of Southeast Asia
- 531-532 History of China
- 541-542 History of Japan
- 543-544 Pre-Modern Japan
- 545-546 History of Korea
- 551-552 History of South Asia
- 553 Russian Central Asia and the Caucasus
- 654 Seminar in Mainland Southeast Asian History
- 655 Seminar in Island Southeast Asian History
- 659-660 Chinese Intellectual History
- 661 Seminar in Chinese History
- 663 Seminar in Indian History
- 665 Seminar in Japanese History
- 666 Seminar in Political History of Modern Japan
- 667-668 Japanese Intellectual History
- 669-670 Seminar on Pre-Modern Japan
- 713 Research Materials and Methods in Asian History
- 714 Chinese Historical Literature

### The Pacific

- 439 Australia and New Zealand
- 571 History of Oceania
- 574 The United States in the Pacific
- 577 History of the Hawaiian Islands
- 675 Seminar in Pacific History

### Americas

- 461-462 History of the United States to 1877
- 463-464 History of the United States since 1877
- 471-472 Diplomatic History of the United States
- 475 Constitutional History of the United States
- 481 American Thought and Culture
- 491 The West in American History
- 492 The South in American History
- 493 The City in American History
- 511-512 History of Latin America
- 635 The Colonial Period in American History
- 636 Seminar in Nineteenth-Century American History
- 637 The Progressive Period in American History
- 638 Seminar in Recent American History
- 640 Seminar in American Social and Intellectual History
- 641 Seminar in American Diplomatic History
- 731 Advanced Problems and Reading in American History

### Europe

- 401-402 Greek and Roman Civilizations
- 405-406 Medieval Europe, 300-1300
- 409 Renaissance and Reformation, 1300-1600
- 410 Early Modern Europe, 1600-1800
- 425 Europe in the Nineteenth Century
- 426 Europe since Versailles
431-432 History of England
435 Constitutional History of England
441-442 East Central Europe
443-444 History of Germany
445-446 History of France
451-452 History of Russia
455-456 European Intellectual History
611 Seminar in European History
   (1) Ancient
   (2) Medieval
   (3) Early Modern
   (4) Modern
   (5) England
618 British Empire and Commonwealth
671-672 Seminar in Russian History

Historiography, Historical Method, and Directed Research

699 Directed Research
711 Seminar in Historical Method
712 Seminar in Historiography
800 Thesis Research

Horticulture

GRADUATE FACULTY
J. C. Gilbert, Ph.D. (Chairman)—vegetable breeding
J. L. Brewbaker, Ph.D.—radiation genetics
R. A. Hamilton, Ph.D.—tropical fruit improvement
H. Kamemoto, Ph.D.—ornamental cytogenetics
H. Y. Nakasone, Ph.D.—tropical fruit breeding
R. R. Romanowski, Ph.D.—vegetable physiology
Y. Sagawa, Ph.D.—developmental morphology and cytogenetics
R. M. Warner, Ph.D.—tropical fruit ecology

AFFILIATE FACULTY
R. L. Cushing, M.S.—plant genetics
D. B. Heinz, Ph.D.—sugar cane cytogenetics
K. R. Kerns, M.S.—plant breeding
B. Krauss, M.S.—plant physiology
L. G. Nickell, Ph.D.—plant physiology
J. B. Smith, Ph.D.—plant genetics
J. N. Warner, Ph.D.—sugar cane breeding
D. P. Watson, Ph.D.—ornamentals

Intended candidates for the M.S. or Ph.D. in horticulture must present a minimum of 24 hours of undergraduate credit in plant sciences (including botany, horticulture, agronomy, plant pathology) and related fields. Basic courses in chemistry and botany are required. Deficiencies must be made up without credit.

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

Horticulture

453 Principles of Plant Breeding (3)
463 Principles of Floriculture (3)
464 Orchidology (3)
FIELDS OF STUDY

471 Post-Harvest Physiology (3)
494 Systematic Vegetable Crops (3)
566 Advanced Tropical Pomology (3)
603 Experimental Design (3)
611 Advanced Plant Breeding (3)
618 Plant Cytogenetics
666 Radiation Biology (3)
*667* Horticulture Seminar (1)
668 Plant Growth and Development in Horticulture (2)
691 Crop Ecology (3)
699 Directed Research (arr.)
711 Special Topics in Experimental Horticulture (arr.)
800 Thesis Research (arr.)

Japanese

GRADUATE FACULTY
J. Young, Ph.D. (Chairman)—applied linguistics and history
J. T. Araki, Ph.D.—literature
N. Fujioka, M.A.—grammar, history of Japanese language
H. Ikeda, Ph.D.—narrative literature, bibliography
Y. Uyehara, M.A.—contemporary literature, poetry
V. Viglielmo, Ph.D.—literature
K. Yasuda, D.Litt.—classical literature, poetry

Both Plan A (thesis) and Plan B (non-thesis) M.A. programs in one of the following three major fields are available: (1) literature, (2) language, and (3) teaching of Japanese as a second language (JASL). Intended candidates must have a B.A. in Japanese or have had equivalent preparation in the discipline.

Under Plan A, 18 semester hours of course work in the major field and 6 semester hours of course work in the related field and 6 semester hours of thesis research are the minimum requirements.

Under Plan B, a minimum of 24 semester hours of course work in the major field and 6 semester hours of course work in the related field is required.

No more than 6 credits from courses numbered below 600 may be applied toward satisfaction of the requirement under either Plan A or Plan B. In addition, a reading knowledge of another language approved by the graduate faculty is required.

Japanese

401–402 Japanese Literature in English (3–3)
408 Structure of Japanese (3)
417–418 Fourth-Level Japanese (3–3)
428 Accelerated Fourth-Level Japanese (6)
431–432 Introduction to Classical Japanese Literature (3–3)
440 Advanced Japanese Composition (2)
493 Reference Materials for Japanese Studies (3)
611–612 Contemporary Japanese Literature (3–3)
613–614 Edo Literature (3–3)
615–616 Classical Japanese Literature (3–3)
619–620 Japanese Poetry (3–3)
621–622 History of Japanese Literary Criticism (3–3)
631–632 History of Japanese Language (3–3)
633–634 Japanese Grammar–Colloquial (3–3)
635–636 Japanese Grammar—Classical (3–3)
641-642  Contrastive Study of Japanese and English Structure (3-3)
643-644  Methodology in Teaching of Japanese as a Second Language (3-3)
645-646  Intern Teaching in Japanese (3-3)
694     Japanese Bibliography (3)
699     Directed Research in Japanese (3)
750     Research Seminar in Japanese (3)
809     Thesis Research (arr.)
AP 690  Directed Reading (arr.)
AP 751-752 Seminar in East Asian Comparative Literature (3-3)

Library Studies

GRADUATE FACULTY
R. R. Shaw, Ph.D. (Dean) — administration, documentation
G. S. Bonn, M.S., M.A. in L.S. (Associate Dean) — science and technology, government documents
M. M. Andrews, M.S. in L.S. — management, reader services
M. W. Ayrault, M.S. in L.S. — cataloging and classification
E. R. Casellas, M.S. in L.S. — business and economics
N. F. Dumont, M.S. in L.S. — social functions of libraries
I. W. Harris, M.L.S. — reader services
M. K. Jackson, B.A., B.S. in L.S. — social functions of libraries
D. C. McIntosh, B.Ed., B.S. in L.S. — cataloging and classification
D. W. McNeil, M.S. in L.S.
E. I. Schofield, Ed.D. — audio-visual services
H. C. Stevens, B.S. in L.S., M.A. — children's literature
R. D. Stevens, Ph.D. — administration
M. G. Taylor, M.L.S. — building library collections, reference
H. R. Wheeler, Ed.D. — young people's literature, reference

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

College, Public, and Special Librarians: The normal basic curriculum for public, college, and special librarians includes the following courses. Field experience, on a non-credit basis, will be available to persons interested in firsthand contact with children, young adult, and adult services.

LIBRARY STUDIES
601     Bibliography and Reference Sources (3)
602     Advanced 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)
650     Administration of Libraries (3)
678     Reader Services (3)

ELECTIVES
606     Advanced Cataloging and Classification (3)
618     Government Documents (3)
642     Audio-Visual Services in Libraries (3)
660     Science and Technology Literature (3)
662     Business and Economic Literature (3)
664     Abstracting and Indexing for Information Services (3)
670     Literature Searching and Documentation (3)
School Librarians: The basic program for school library work is identical with the above; in addition, the following courses are also required:

Library Studies

- Reading Materials for Children (3)
- Reading Materials for Youth (3)
- Service for Children and Young People (3)
- Traditional Literature and Oral Narration (3)
- Field Seminar (during last term in the School of Library Studies) (3)

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

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

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

Linguistics

Graduate Faculty

- H. P. McKaughan, Ph.D. (Chairman) - descriptive and theoretical linguistics, Philippine and Papuan languages
- B. W. Bender, Ph.D. - descriptive and applied linguistics, Marshallese and other Micronesian languages, comparative Micronesian
- S. H. Elbert, Ph.D. - comparative and historical linguistics, Hawaiian and other Polynesian and Micronesian languages
- G. W. Grace, Ph.D. - theoretical, comparative, and historical linguistics, ethnolinguistics, Malayo-Polynesian languages
- A. J. Schütz, Ph.D. - descriptive linguistics, field methods, Melanesian and Polynesian languages
- 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

Intended candidates for the M.A. or Ph.D. in linguistics must present a minimum background of 27 credits in language study or be prepared to make up such work during the first year of graduate study. Included in this background should be the following, or the equivalent: 3 hours of introductory linguistics, 3 hours of introductory work in historical-comparative linguistics, and at least 6 hours of the structure of English. Those not fulfilling these specified requirements may be admitted to candidacy only under conditions stipulated by the graduate faculty.
M.A. Requirements

The department offers two programs: Plan A leading to the M.A. in linguistics, and Plan B leading to the M.A. in applied linguistics. Besides the general requirements of the Graduate Division, Plan A requires a reading knowledge of French, German, or Russian to be demonstrated at least one full semester before the candidate takes his final examination. The substitution of another language may be made if there is sufficient linguistic literature in such language, and if approved by the graduate faculty in linguistics. Plan A requires 24 units and a thesis (6 units).

Plan B requires either a reading knowledge of one of the languages mentioned above, or conversational control of a second language other than that native to the candidate. The latter must be approved by the department and may be demonstrated by examination. In addition, in either case, the student must have a knowledge of the structure of the language in question. Plan B requires a minimum of 30 units approved by the candidate’s program committee. Six of these must be earned in courses outside of the department of linguistics, chosen in consultation with the candidate’s advisors. This plan also requires a written comprehensive examination near the end of the course work in addition to the Graduate Division requirement of a final seminar appearance.

Ph.D. Requirements

Ph.D. candidates must pass a comprehensive examination and a final oral examination in defense of the dissertation. A reading knowledge of two languages other than that native to the candidate is required. French, German, and Russian are acceptable; others must be approved by the graduate faculty in linguistics. The doctoral candidate is expected also to have one or more minor fields of study selected in consultation with his advisors. Suggested fields include anthropology, Asian and Pacific languages, English, European languages, philosophy, and psychology.

Courses are listed below to guide the candidate, M.A. or Ph.D., in his preparation for the various examinations. The major portion of the work done beyond the M.A. level will be in seminars and directed research, though the candidate must expect to do individual study in areas not covered by course offerings.

Linguistics

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>610</td>
<td>Articulatory Phonetics</td>
<td>(3)</td>
</tr>
<tr>
<td>620</td>
<td>Introduction to Linguistic Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>621</td>
<td>Phonemics</td>
<td>(3)</td>
</tr>
<tr>
<td>622</td>
<td>Morphology and Syntax</td>
<td>(3)</td>
</tr>
<tr>
<td>630</td>
<td>Field Methods</td>
<td>(3)</td>
</tr>
<tr>
<td>645</td>
<td>Comparative Method</td>
<td>(3)</td>
</tr>
<tr>
<td>650-651</td>
<td>Advanced Linguistic Analysis</td>
<td>(3-3)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research</td>
<td>(arr.)</td>
</tr>
<tr>
<td>710</td>
<td>Areal Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>720</td>
<td>Seminar in Applied Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>750</td>
<td>Seminar</td>
<td>(3)</td>
</tr>
<tr>
<td>760</td>
<td>Problems in Comparison and Pre-History</td>
<td>(3)</td>
</tr>
<tr>
<td>780</td>
<td>Ethno-Linguistics</td>
<td>(3)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis or Dissertation Research</td>
<td>(arr.)</td>
</tr>
</tbody>
</table>
Mathematics

GRADUATE FACULTY
K. Rogers, Ph.D. (Chairman) — algebra, number theory
C. Gregory, Ph.D. — applied mathematics, differential equations, statistics, theoretical physics
W. Leahey, Ph.D. — algebraic number theory
H. Loomis, Ph.D. — applied mathematics
A. Mader, Ph.D. — group theory
E. Mookini, Ph.D. — analysis
F. B. Strauss, Ph.D. — algebra
Z. Z. Yeh, Ph.D. — topology, analysis

Intended candidates must present a minimum preparation of differential and integral calculus, differential equations, linear algebra, advanced calculus and modern algebra. In addition to the examinations prescribed by the graduate division, candidates for the M.A. must pass a written comprehensive examination in their last semester.

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

MATHEMATICS
402 Differential Equations (3)
420 Introduction to the Theory of Numbers (3)
441 Numerical Analysis (3)
442 Vector Analysis (3)
444 Functions of a Complex Variable (3)
471 Probability (3)
472 Statistical Inference (3)
501-502 Theory of Sets and Metric Spaces (3-3)
601-602 Applied Mathematics (3-3)
611-612 Modern Algebra (3-3)
621-622 Topology (3-3)
631-632 Functions of a Real Variable (3-3)
644-645 Analytic Function Theory (3-3)
650 Seminar (1)
699 Directed Research (arr.)
800 Thesis Research (arr.)

Meteorology

GRADUATE FACULTY
C. S. Ramage, Sc.D. (Chairman) — tropical meteorology
W. C. Chiu, Ph.D. — stratospheric meteorology, large scale atmospheric turbulence, atmospheric oscillations
P. C. Ekern, Ph.D. — agricultural meteorology, hydrology
M. A. Estoque, Ph.D. — numerical analysis and prediction, atmospheric boundary layer phenomena
A. H. Woodcock, D.Sc. — cloud physics
E. J. Workman, Ph.D. — atmospheric electricity, cloud electrification

Intended candidates for an advanced degree 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. A reading knowledge of
one foreign language is required for the M.S. In addition to the examinations prescribed by the Graduate Division, candidates for the M.S. must pass a comprehensive examination in the field.

Available courses are listed below. Courses may also be allowed in the fields of oceanography, physics, and mathematics.

**Geosciences**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>560</td>
<td>Satellite Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>565</td>
<td>Advanced Tropical Meteorology</td>
<td>5</td>
</tr>
<tr>
<td>742</td>
<td>Atmospheric Turbulence</td>
<td>3</td>
</tr>
<tr>
<td>743</td>
<td>Cloud Physics</td>
<td>3</td>
</tr>
<tr>
<td>744</td>
<td>Physical Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>745</td>
<td>Numerical Analysis and Prediction</td>
<td>5</td>
</tr>
<tr>
<td>746</td>
<td>Statistical Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>750</td>
<td>Advanced Theoretical Meteorology I</td>
<td>3</td>
</tr>
<tr>
<td>751</td>
<td>Advanced Theoretical Meteorology II</td>
<td>3</td>
</tr>
<tr>
<td>752</td>
<td>Special Topics in Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>753</td>
<td>Advanced Topics in Synoptic Meteorology</td>
<td>3</td>
</tr>
<tr>
<td>765</td>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td>775</td>
<td>Historical Development of Meteorological Ideas</td>
<td>1</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research (arr.)</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
<td></td>
</tr>
</tbody>
</table>

**Microbiology**

**Graduate Faculty**

- A. A. Benedict, Ph.D. (Chairman) - immunology
- L. R. Berger, Ph.D. - general bacteriology and physiology
- O. A. Bushnell, Ph.D. - medical and economic bacteriology
- G. W. Chu, Sc.D. - medical bacteriology and parasitology
- D. E. Contois, Ph.D. - general bacteriology and physiology
- C. E. Folsome, Ph.D. - general bacteriology and microbial genetics
- H. A. Frank, Ph.D. - food microbiology
- H. R. Hohl, Ph.D. - general microbiology and microbial cytology
- P. C. Loh, Ph.D. - virology

**Affiliate Faculty**

- M. Levine, Ph.D. - public health and medical bacteriology
- J. Stephenson, M.D. - medical bacteriology
- M. Yokoyama, M.D. - immunology

Intended candidates must present a minimum of 15 hours of undergraduate work in microbiology, a basic course in biology, botany, or zoology, and courses in general and organic chemistry, quantitative analysis, and college physics. Deficiencies in undergraduate preparation must be made up.

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

**Microbiology**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>415</td>
<td>Advanced General Bacteriology</td>
<td>3</td>
</tr>
<tr>
<td>531</td>
<td>Microbial Physiology</td>
<td>3</td>
</tr>
<tr>
<td>625</td>
<td>Immunochemistry</td>
<td>4</td>
</tr>
<tr>
<td>632</td>
<td>Advanced Microbial Physiology</td>
<td>3</td>
</tr>
</tbody>
</table>
FIELDS OF STUDY

655 Virology (2)
657 Virology Laboratory (3)
661 Ultrastructure of Microorganisms (3)
665 Electron Microscopy (2)
671 Microbial Genetics (4)
681 Host-Parasite Relationships (3)
*690 Seminar (1)
*695 Special Topics in Microbiology (arr.)
*699 Directed Research (arr.)
800 Thesis Research (arr.)

Music

GRADUATE FACULTY
A. Russell, A.M.D. (Chairman) — music composition
M. Kerr, M.M.—music performance, piano
O. F. Paul, Ed.D.—music education
N. D. Rian, Ed.D.—music education
B. B. Smith, M.M.—ethnomusicology
R. Vaught, Ph.D.—musicology
R. W. Vine, M.M.—music performance, voice

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 ethnomusicology, in musicology, and in music education. The M.F.A. in music is offered with a concentration in composition and in performance. It is important that the student declare the specific concentration for which he will be an intended candidate at the time of his application. This declaration is important in determining possible deficiencies. For concentration in music education a record of teaching experience should be presented. 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. For concentration in composition three original compositions should be submitted which are representative of previous work in various forms and media.

Before being admitted to candidacy the student will be required to successfully complete the general examination. This involves (1) a basic theory background as included in the first two years of the undergraduate major, (2) a broad knowledge of music literature from the Middle Ages to the present and (3) background in the area of concentration for ethnomusicology, music education, musicology, and composition. Students concentrating in composition will be examined in the area of form and analysis, counterpoint and orchestration.

Concentration in composition, ethnomusicology, and musicology follow the thesis program only (Plan A). The concentration in performance follows the non-thesis program only (Plan B). For concentration in musicology a reading knowledge of French or German is required; for
concentration in other areas a foreign language appropriate to the field of thesis research may be required as determined by the supervising committee. The requirement of 12 or 18 credits of courses numbered 600 or above may be waived where appropriate by the graduate faculty except for candidates in music education.

Candidates concentrating in music education may choose between the thesis program and the non-thesis program which normally includes 12 credit hours in music education, 18 credit hours in other music courses and 6 credit hours in related courses as advised by the supervising committee. Requirements for the Hawaii State Department of Education Professional Certificate may be met in the M.A. program in music education.

Courses for the graduate major must be selected from those listed below. Normally a minimum of 6 credit hours may be selected from advanced courses in anthropology, drama, education, English literature, Asian, Pacific or European languages, philosophy, psychology, sociology, or other disciplines closely related to the field of thesis research as determined by the supervising committee. A seminar in the field of concentration is required of all candidates.

### MUSIC

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>University Concert Choir (1)</td>
</tr>
<tr>
<td>401</td>
<td>Ensemble Music (1)</td>
</tr>
<tr>
<td>405</td>
<td>University Orchestra (1)</td>
</tr>
<tr>
<td>409</td>
<td>University Concert Band (1)</td>
</tr>
<tr>
<td>435</td>
<td>Individual Instruction (arr.)</td>
</tr>
<tr>
<td>451</td>
<td>Advanced String Methods (2)</td>
</tr>
<tr>
<td>452</td>
<td>Advanced Woodwind Methods (2)</td>
</tr>
<tr>
<td>453</td>
<td>Advanced Brass Methods (2)</td>
</tr>
<tr>
<td>455</td>
<td>Advanced Percussion Methods (2)</td>
</tr>
<tr>
<td>461</td>
<td>Music of the Baroque Period (2)</td>
</tr>
<tr>
<td>462</td>
<td>Music of the Classic Period (2)</td>
</tr>
<tr>
<td>463</td>
<td>Music of the Romantic Period (2)</td>
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<td>464</td>
<td>Contemporary Music (2)</td>
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<td>Art Music of Asia (2)</td>
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<td>471</td>
<td>Music of Non-Literate Peoples (3)</td>
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<td>481</td>
<td>Advanced Orchestration (2)</td>
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<tr>
<td>483-484</td>
<td>Counterpoint (2-2)</td>
</tr>
<tr>
<td>485-486</td>
<td>Form and Analysis (2-2)</td>
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<tr>
<td>487-488</td>
<td>Composition (2-2)</td>
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<tr>
<td>489-490</td>
<td>Advanced Composition (2-2)</td>
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<tr>
<td>580</td>
<td>Theoretical Aspects of Music Styles (3)</td>
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<tr>
<td>600</td>
<td>Seminar</td>
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1. composition
2. ethnomusicology
3. musicology
4. performance repertory
5. music education

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<tr>
<td>635</td>
<td>Advanced Individual Instruction (arr.) M.F.A. only</td>
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<tr>
<td>650</td>
<td>Problems in Music Education (2)</td>
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<tr>
<td>651</td>
<td>Foundations in Music Education (2)</td>
</tr>
<tr>
<td>654</td>
<td>Pacific and Asian Music in Education (2)</td>
</tr>
</tbody>
</table>

* *Graduate credit not available to candidates for a degree in composition.
†*Graduate credit not available to candidates for a degree in musicology.
FIELDS OF STUDY

657–658 Advanced Conducting (2–2)
661 Bibliography and Research Methods in Music (3)
670 Regional Musics (3)
  (1) Asia
  (2) Oceania
680 Advanced Problems in Music Theory (2)
  (1) counterpoint
  (2) form and analysis
  (3) orchestration
  (4) pedagogy
  (5) transcription of performance practices
699 Directed Work (arr.)
800 Thesis Research (arr.)

Nursing

GRADUATE FACULTY
M. Dunlap, Ed.D. (Chairman) — curriculum and teaching
L. Bermosk, M.Litt. (Director) — psychiatric nursing
W. Cody, M.D. — psychiatry
L. Love, M.S. — psychiatric nursing

Intended candidates for the master of science degree in mental health-psychiatric nursing must present a baccalaureate degree with a major in nursing which includes theory and field experience in psychiatric and public health nursing, a course in elementary statistics, and have active registration for the practice of nursing.

The M.S. in mental health-psychiatric nursing focuses on the preparation of the clinical specialist and consists of three semesters or 36 hours of graduate credit under Plan B (non-thesis). Clinical experience is an integral part of the seminars and practicum conferences, wherein students study their interactions with selected psychiatric patients and demonstrate their capacity for self-directed and independent study in their investigation of the validity of formulated concepts.

NURSING
610 Curriculum Development (3)
630 Seminar (2): (1) Advanced Psychiatric Nursing Concepts (each semester)
640 Practicum (2): (1) Advanced Psychiatric Nursing: Adults; Children; Community Psychiatry (each semester)
655–656 Advanced Psychiatric Concepts (2–2)
699 Directed Research (arr.)

COGNATES

PSYCHOLOGY
460 Psychology of Personality (3)
600 Group Dynamics (3)
630 Experimental Psychology (3)

PUBLIC HEALTH
665 Socio-Cultural Aspects of Health and Illness (3)

Nutrition

GRADUATE FACULTY
M. L. Brown, Ph.D. (Chairman) — vitamins, reproduction and growth
D. M. Hilker, Ph.D. — carbohydrate metabolism, enzymology
I. J. Lichton, Ph.D. — fluid handling, endocrinology
B. R. Standal, Ph.D. — protein, lipid metabolism
Intended candidates for the M.S. in nutrition must present an undergraduate major in foods and nutrition or equivalent preparation in a related area which includes qualitative and quantitative analysis, organic chemistry, vertebrate zoology, and general physics. Undergraduate deficiencies will be determined by the faculty. Courses for the graduate major are to be selected from those listed below. Majors are required to take 701 each semester of study. Additional graduate courses may be taken in animal science, chemistry, biochemistry, food science, physiology, or other related fields. A thesis is required.

**NUTRITION**

- 601-602 Human Nutrition (3-3)
- 603-604 Human Nutrition Laboratory (1-1)
- 621 Topics in Nutrition (2)
- 622 Nutritional and Metabolic Diseases (2)
- 651 Nutrition Surveys (2)
- 699 Directed Readings and Research (arr.)
- 701 Seminar (1)
- 800 Thesis Research (arr.)

**Oceanography**

**GRADUATE FACULTY**

- R. G. Bader, Ph.D. (Chairman) —geochemical
- V. E. Brock, M.A. —biological
- T. K. Chamberlain, Ph.D. —geological
- R. Chutter, Ph.D. —biological
- M. Gimartin, Ph.D. —biological
- G. W. Groves, Ph.D. —physical
- B. F. Pashy, Ph.D. —chemical
- H. M. Stommel, Ph.D. —physical (Capt. Cook Chair)
- K. Wyrski, Ph.D. —physical

**AFFILIATE FACULTY**

- R. Barkley, Ph.D. —physical
- J. C. Marr, M.A. —biological
- C. R. Seckel, M.S. —physical

The University currently offers a master's degree program in physical, chemical, geological, and biological oceanography, and anticipates expansion of this program to the doctorate by 1966.

Intended candidates should have a major in one of the sciences, mathematics, or engineering. Depending upon the specific areas of interest in oceanography, undergraduate deficiencies if any, will be determined by the faculty. A reading knowledge of a foreign language is required.

Students pursuing a degree program must take the following courses or their equivalents: Ocn 620; 621; 622; 623; 799 (two units).

Courses listed below are available for credit in the degree program. Additional courses may be selected from the fields of botany, chemistry, engineering, geology, mathematics, meteorology, physics, and zoology.

It should be understood that many oceanography courses involve varying amounts of work at sea although specific activity levels per course are not shown since lengths, objectives, and times of occurrence vary.
### FIELDS OF STUDY

#### OCEANOGRAPHY

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<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
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<tr>
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<td>Physical Oceanography</td>
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<td>621</td>
<td>Biological Oceanography</td>
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<td>622</td>
<td>Geological Oceanography</td>
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<td>623</td>
<td>Chemical Oceanography</td>
<td>2</td>
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<td>625</td>
<td>Sea and Laboratory Techniques</td>
<td>2</td>
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<td>631</td>
<td>Marine Phytoplankton</td>
<td>3</td>
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<tr>
<td>632</td>
<td>Littoral Geological Processes</td>
<td>3</td>
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<tr>
<td>633</td>
<td>Chemical Oceanography Laboratory Methods</td>
<td>2</td>
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<td>641</td>
<td>Advanced Physical Oceanography</td>
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<tr>
<td>642</td>
<td>Marine Zooplankton</td>
<td>3</td>
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<td>643</td>
<td>Recent Marine Sediments</td>
<td>3</td>
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<tr>
<td>644</td>
<td>Marine Geochemistry</td>
<td>3</td>
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<td>651</td>
<td>Dynamics of Marine Productivity</td>
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<tr>
<td>652</td>
<td>Chemical Processes in the Sea</td>
<td>3</td>
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<td>660</td>
<td>Ocean Wave Theory</td>
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<td>672</td>
<td>Ocean Basins</td>
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<td>675</td>
<td>Seminar in Special Topics</td>
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<td>680</td>
<td>Engineering Aspects of Oceanography</td>
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<td>701</td>
<td>Fisheries Oceanography</td>
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<td>705</td>
<td>Oceanography of Hawaiian Region</td>
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### Overseas Career Program

**GRADUATE FACULTY**

John M. Allison, LL.D. (Director) — foreign affairs
W. G. Hackler, M.A. (Associate Director) — foreign affairs

The Overseas Career Program is open only to graduate students who are intended candidates for a master's degree in one of the regular academic departments of the University and is a prescribed course of study designed to prepare Americans for service in Asia with governmental and international agencies, private institutions, and business. In conjunction with the objectives of the program and the student's academic background, experience and goals, a coordinated course of study will be individually arranged.

Upon successful completion of the requirements for the master’s degree and the Overseas Career Program, an overseas career certificate will be awarded. To obtain the certificate as well as the master’s degree in another department will, in most cases, take a longer period of time than would be required for the master's degree alone.

To qualify for the overseas career certificate, 15 semester hours of credit at the graduate level are required:

- **Six (6) hours**—Overseas Career Training Seminar, a two-semester seminar required of all candidates for the certificate.
- **Three (3) hours**—Internship in an Asian country; internships consist of active duty for at least six months (in many cases up to twelve months) with governmental or private agencies in Asia. Periodic and final reports are required.
- **Six (6) hours in area studies** in one Asian country or region and related elective courses, for example:
American Civilization for Overseas Americans
Anthropology of Southeast Asia
Comparative Management
Economics of Agriculture: Tropical Countries and Asia
Economic Development of Underdeveloped Areas
Foreign Marketing
Politics of National Development

One or more of these courses might well be part of the student's course program for the master's degree in another department.

The other requirement for the overseas career certificate, for which no credit is given, is proficiency in an Asian language. Students may satisfy this requirement by passing an examination given by the department of Asian and Pacific languages or by successfully completing intermediate language courses.

The requirements for an internship and area studies may be waived if the student presents satisfactory evidence of equivalent knowledge and experience.

Courses available for graduate credit are:

**Pacific Islands Studies**

**Faculty Committee**
N. Meier, Ph.D. (Chairman) — political science
G. Daws, M.A. — history
G. Grace, Ph.D. — linguistics
C. Hunter, Ph.D. — history
L. Mason, Ph.D. — anthropology
J. Street, Ph.D. — geography

The required undergraduate background is 18 hours of credit (or the equivalent) dealing with the Pacific Islands area in such fields as the following: anthropology, art, geography, history, linguistics, literature, music, political science, and sociology. A basic course in either anthropology or geography of the Pacific Islands is required. Candidates are urged to acquire a reading knowledge of French, German, Hawaiian, Japanese, or Spanish and to utilize the chosen language in thesis research.

Courses are to be selected from those listed below in such manner as to provide an integrated program bearing upon a particular concentration of interest. At least three departments must be represented. In valid instances, courses relating to the Pacific Islands in certain fields such as agriculture, botany, chemistry, microbiology, nutrition, public health, and zoology, may be substituted. Required courses are marked with an asterisk.
### Fields of Study

#### Anthropology

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>450</td>
<td>Regional Cultures of Oceania (3)</td>
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<tr>
<td></td>
<td>(1) Hawaii</td>
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<td>(2) Micronesia</td>
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<tr>
<td></td>
<td>(3) Polynesia</td>
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<td>(4) Melanesia</td>
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<td>Regional Archeology (3)</td>
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<td>(1) Asia and the Pacific</td>
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<td>699</td>
<td>Directed Research (arr.)</td>
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<tr>
<td>750</td>
<td>Research Seminar (in Oceania) (3)</td>
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#### English

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<th>Course Code</th>
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<td>585</td>
<td>Literature of the Pacific (3)</td>
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#### Geography

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<td>561</td>
<td>Geography of Australia and New Zealand (2)</td>
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<td>571</td>
<td>Geography of the Pacific Islands (3)</td>
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<td>578</td>
<td>Geography of Hawaii (3)</td>
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<td>Seminar in Geography of the Pacific (3)</td>
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#### History

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<td>439</td>
<td>Australia and New Zealand (3)</td>
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<tr>
<td>571</td>
<td>History of Oceania (3)</td>
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<td>575</td>
<td>The United States in the Pacific (3)</td>
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<td>577</td>
<td>History of the Hawaiian Islands (3)</td>
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<tr>
<td>675</td>
<td>Seminar in Pacific History (3)</td>
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<td>401</td>
<td>Ensemble (Asian and Pacific) (1)</td>
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<td>435</td>
<td>Hawaiian Chant (var.)</td>
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<th>Course Code</th>
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<td>471</td>
<td>Music of Non-literate Peoples (3)</td>
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<td>Pacific and Asian Music in Education (2)</td>
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<td>Regional Musics (Oceanic) (3)</td>
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#### Pacific Islands

<table>
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#### Political Science

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<td>Government and Politics of Polynesia (3)</td>
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<td>640</td>
<td>Politics of National Development (3)</td>
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<td>Directed Reading and Research (arr.)</td>
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#### Sociology

<table>
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<td>Race Relations in the Pacific (3)</td>
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<tbody>
<tr>
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<td>Directed Research (arr.)</td>
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</tbody>
</table>

### Philosophy

**Graduate Faculty**

- **W. E. Nagley, Ph.D.** (Chairman) — history of Western religious philosophy, existential philosophy
- **C. Y. Cheng, Ph.D.** — Chinese philosophy, philosophy of language
- **R. P. Haynes, Ph.D.** — history and theory of Greek philosophy, ethics
- **K. K. Inada, Ph.D.** — history and theory of Buddhist philosophy, Asian thought
- **H. E. McCarthy, Ph.D.** — history and theory of metaphysics, philosophy of art
- **C. A. Moore, Ph.D.** — Oriental and East-West philosophy
- **M. D. Resnik, Ph.D.** — symbolic logic, foundations of mathematics
- **S. K. Saksena, Ph.D.** — history and theory of Indian philosophy, comparative: Indian and Western
Intended candidates for the M.A. or the Ph.D. must present a minimum undergraduate background of 24 credits in philosophy, including courses in history of philosophy, ethics, logic, and contemporary philosophy. Related courses in anthropology, art, drama, Far Eastern studies, history, literature, mathematics, psychology, sociology, and the biological and physical sciences are recommended.

Degrees are offered in three specific areas of philosophy: (1) Western Philosophy. All graduate students in philosophy must acquire a first-rate knowledge of the history and problems of Western philosophy. The Western tradition is the lecture and research frame of reference for the department and serves as the base of operations for its unique work in the Asian and comparative fields. (2) Asian Philosophy. Resting on the mandatory mastery of the Western field, the department offers the Asian field of specialization. Three areas in the Asian field are available: Indian, Buddhist, or Chinese. (3) Comparative Philosophy. In this field the candidate elects a comparison of any one of the three Asian fields, Indian, Buddhist, or Chinese, with any one of the three Western fields, Greek, Modern Classical, or Contemporary.

Full details of all programs are available in a special brochure.

**Western**

<table>
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<tr>
<td>410</td>
<td>American Philosophy (3)</td>
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<td>431</td>
<td>Symbolic Logic I (3)</td>
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<td>432</td>
<td>Symbolic Logic II (3)</td>
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<td>Philosophy of Language (3)</td>
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<td>British Empiricism (3)</td>
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<td>Continental Rationalism (3)</td>
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<td>Kant (3)</td>
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<td>Plato (3)</td>
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<td>Medieval Philosophy (3)</td>
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<td>Philosophy of Religion (3)</td>
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<td>510</td>
<td>Philosophy in Literature (3)</td>
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<td>520</td>
<td>Existential Philosophy (3)</td>
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<td>Theory of Science (3)</td>
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<td>555</td>
<td>Foundations of Science (3)</td>
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<td>601</td>
<td>Seminar in Greek Philosophy (3)</td>
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<td>Seminar in Modern Philosophy (3)</td>
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<td>Seminar in Contemporary Philosophy (3)</td>
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**Eastern**

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<td>Philosophical Foundations of Indian Culture (3)</td>
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<td>450</td>
<td>Indian Philosophy (3)</td>
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<td>451</td>
<td>Contemporary Indian Philosophy (3)</td>
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<td>Indian Social Philosophy (3)</td>
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### Fields of Study

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<td>Buddhist Philosophy (3)</td>
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<td>Theravada Buddhist Philosophy (3)</td>
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<td>Mahayana Buddhist Philosophy (3)</td>
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<td>Zen Buddhist Philosophy (3)</td>
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<tr>
<td>470</td>
<td>Chinese Philosophy (3)</td>
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<tr>
<td>471</td>
<td>Confucianism (3)</td>
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<td>472</td>
<td>Neo-Confucianism (3)</td>
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<td>473</td>
<td>Taoism (3)</td>
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<tr>
<td>650</td>
<td>Seminar in Indian Philosophy (3)</td>
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<tr>
<td>660</td>
<td>Seminar in Buddhist Philosophy (3)</td>
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<td>670</td>
<td>Seminar in Chinese Philosophy (3)</td>
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#### Comparative

<table>
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<th>Course Code</th>
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<tr>
<td>465</td>
<td>Philosophy, East and West (3)</td>
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<tr>
<td>690</td>
<td>Seminar in Comparative Philosophy (3)</td>
<td></td>
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<tr>
<td>*699</td>
<td>Directed Research (Greek, Modern Classical, Contemporary Western, Indian, Buddhist, Chinese, and Comparative) (arr.)</td>
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<tr>
<td>*800</td>
<td>Thesis Research (arr.)</td>
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</table>

### Physics and Astronomy

#### Graduate Faculty

- J. R. Holmes, Ph.D. (Chairman) — optics, spectroscopy
- R. J. Cence, Ph.D.—elementary particles
- P. N. Dobson, Ph.D.—theoretical physics
- S. Y. H. Hee, Ph.D.—nuclear physics, optics
- J. T. Jefferies, D.Sc.—astrophysics
- J. C. Kudar, Ph.D.—theoretical physics
- H. C. McAllister, Ph.D.—optics, spectroscopy
- I. Miyake, M.S.—acoustics, electronics
- F. Q. Orrall, Ph.D.—astrophysics
- V. Z. Peterson, Ph.D.—elementary particles
- W. Pong, Ph.D.—solid state
- W. R. Steiger, Ph.D.—optics, atmospheric and solar physics
- V. J. Stenger, Ph.D.—elementary particles
- K. Watanabe, Ph.D.—spectroscopy

Intended candidates for the M.S. or Ph.D. must present a minimum of 35 semester hours of undergraduate credits in physics, including atomic and nuclear physics, electromagnetism, mechanics, optics, and thermodynamics. Year courses in general chemistry and differential equations are also required. Official scores of the Aptitude and the Physics tests of the Graduate Record Examination must be submitted prior to admission.

Courses available for the graduate program are listed below. Required courses are marked with an asterisk. Additional courses may be selected, with approval, in mathematics, chemistry, meteorology, engineering, and philosophy. All graduate students are encouraged to attend the weekly department seminar.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>440</td>
<td>Physical Electronics (3)</td>
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<tr>
<td>*600-601</td>
<td>Methods of Theoretical Physics (3-3)</td>
<td></td>
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<tr>
<td>*605-606</td>
<td>Modern Physics Laboratory (1 or 2)</td>
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<tr>
<td>*610</td>
<td>Analytical Mechanics I (3)</td>
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<tr>
<td>611</td>
<td>Analytical Mechanics II (3)</td>
<td></td>
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</tbody>
</table>

†Required for M.S. Plan B but Physics 699 may be substituted if approved by chairman.
620 Physics of the Upper Atmosphere (3)
625–626 Modern Astrophysics (3–3)
630 Statistical Mechanics (3)
*650 Electrodynamics I (3)
651 Electrodynamics II (3)
660 Advanced Optics (3)
*670 Quantum Mechanics I (3)
671 Quantum Mechanics II (3)
677 Nuclear Physics I (3)
678 Nuclear Physics II (3)
680 Atomic and Molecular Spectra (3)
685 Solid State Theory (3)
*690 Seminar (1)
699 Directed Research (arr.)
700 Seminar on Elementary Particle Physics (1)
710 Quantum Theory of Fields (3)
800 Thesis Research (arr.)

Physiology and Pharmacology

GRADUATE FACULTY
W. C. Cutting, M.D. (Chairman) — chemotherapy
M. H. Baslow, Ph.D. — marine pharmacology
F. Furuhashi, M.D. — virus chemotherapy
J. E. Lemley, Ph.D.
M. D. Raymer, Ph.D. — neurophysiology
T. A. Rogers, Ph.D. — environmental physiology

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

The course work required of candidates includes basic courses in related sciences, or demonstrated competency in these fields, plus other course work adapted to the needs of the particular student as determined by the major professor and the thesis committee. Most students will be expected to take graduate courses in biochemistry, microbiology, and genetics. When it is possible to include them, minimum courses in pathology and clinical medicine will be recommended for some students.

PHYSIOLOGY AND PHARMACOLOGY
601 Human Physiology (3)
602 Physiology of Muscle and Nerve (3)
603 Seminar in Human Physiology (1)
611 Pharmacology: Actions and Uses of Drugs (3)
612 Seminar in Pharmacology (1)
699 Directed Research (arr.)
800 Thesis Research (arr.)

Plant Pathology

GRADUATE FACULTY
R. B. Hine, Ph.D. (Chairman) — soil-borne fungal diseases
M. Aragaki, Ph.D. — fungal physiology, physiology of disease resistance
I. W. Buddenhagen, Ph.D. — bacterial diseases
S. Goto, Ph.D. — epidemiology, diseases of ornamentals
O. V. Holtzmann, Ph.D. — parasitic nematodes, diseases of fruits and nuts
M. Ishii, Ph.D. — virology, diseases of vegetable crops
E. E. Trujillo, Ph.D. — banana diseases, soil-borne fungal diseases
FIELDS OF STUDY

AFFILIATE FACULTY

E. J. Anderson, Ph.D.—soil-borne fungal and nematode diseases
W. J. Apt, Ph.D.—nematology, pineapple diseases
H. W. Klemmer, Ph.D.—soil microbiology
H. Koike, Ph.D.—sugar cane diseases, soil microbiology
C. A. Wismer, Ph.D.—diseases of sugar cane

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

Both Plan A and Plan B are available. Plan B is designed for those students who do not intend to make plant pathological research their profession. In this program at least 9 credits of work in courses numbered 600–799 shall be earned in the major field. Six credits must be earned in directed research in the major field. Students may change from Plan A to Plan B only with the approval of the graduate faculty.

Courses available for the graduate program are listed below. In addition, selected courses from agronomy, biochemistry, botany, chemistry, entomology, genetics, horticulture, microbiology, soil science, zoology, and related disciplines may be approved to fit the needs of individual candidates. Courses marked with an asterisk are required of all thesis program candidates.

PLANT PATHOLOGY

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>610</td>
<td>Principles of Plant Disease Control</td>
<td>3</td>
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<tr>
<td>615</td>
<td>Plant Nematology</td>
<td>3</td>
</tr>
<tr>
<td>620</td>
<td>Plant Pathology Techniques</td>
<td>3</td>
</tr>
<tr>
<td>625</td>
<td>Advanced Plant Pathology</td>
<td>2</td>
</tr>
<tr>
<td>*660</td>
<td>Plant Pathology Seminar</td>
<td>1</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research</td>
<td>(arr.)</td>
</tr>
<tr>
<td>*800</td>
<td>Thesis Research</td>
<td>(arr.)</td>
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</table>

Political Science†

GRADUATE FACULTY

H. J. Friedman, Ph.D. (Chairman)—public administration, comparative government
T. Becker, Ph.D.—public law, political theory
R. S. Cahill, Ph.D.—politics, American government
M. Goldstein, Ph.D.—political theory, American government
M. Haas, Ph.D.—international relations, comparative government
H. S. Kariel, Ph.D.—political theory, American government
O. M. Lee, Ph.D.—international relations, public law, comparative government
W. Levi, Ph.D.—international relations, comparative government
N. Meller, Ph.D.—public administration, public law, American government
R. M. Miwa, Ph.D.—international relations, political theory
C. B. Neff, Ph.D.—international relations, comparative government
A. F. Saunders, Ph.D.—political theory, public law, American government
E. F. Spellacy, Ph.D.—public law, American government
R. B. Stauffer, Ph.D.—comparative government, international relations
D. W. Tuttle, Jr., Ph.D.—politics, American government

†At the time of printing, the graduate program was being revised. Up-to-date information is obtainable from the department.
Intended candidates for M.A. or Ph.D. must present a minimum of 15 hours of undergraduate credit in political science, or the equivalent. Evaluation of a student's performance on his work for the master's degree, which usually is prerequisite, will be used in considering applicants for doctoral candidacy.

Candidates for the master's degree are required to pass a written comprehensive examination in two of the subfields (theory, American government, comparative government, international relations, politics, public administration, public law). The doctoral candidate is required to pass four written comprehensive examinations: one in theory; one or two of the others must be international relations or comparative government (including American); one or two must be politics, public administration, or public law. After completing the written examinations, the doctoral candidate must pass an oral comprehensive administered by three or more members of the graduate faculty.

In addition to formal studies in political science, candidates are required to offer courses in related disciplines, as approved by the supervising committee.

**Political Theory**

**POLITICAL SCIENCE**

- **600** Contemporary Political Science (3)
- **601** Systematic Political Analysis (3)
- **602** Asian Political Thought (3)
- **620** The Political Order: Constitutionalism in America (3)
- **700** Seminar: Classical Western Political Thought (3)
- **701** Seminar: Modern Western Political Thought (3)

**American Government**

- **620** The Political Order: Constitutionalism in America (3)
- **720** Seminar: American National Government (3)
- **721** Seminar: State and Local Government (3)

**Comparative Government**

- **640** Politics of National Development (8)
- **740** Seminar: East Asia (3)
- **741** Seminar: South and Southeast Asia (3)
- **742** Seminar: Comparative Politics (3)
- **751** Seminar: Comparative Public Administration (3)

**International Relations**

- **603** Foreign Policy of Mainland China (3)
- **760** Seminar: International Politics (3)
- **761** Seminar: International Organizations (3)
- **762** Seminar: International Relations of Asia (3)

**Politics**

- **680** Political Behavior (3)
- **681** Public Policy Development (3)
- **780** Seminar: Politics (3)
- **781** Seminar: Legislative Process (3)

*Required for all degree candidates.*
Public Administration

651 Development Administration (3)
656 Seminar in Regional and City Planning (3)
673 Administration Law (3)
681 Public Policy Development (3)
750 Seminar: Public Administration (3)
751 Seminar: Comparative Public Administration (3)

Public Law

670 International Law (3)
673 Administrative Law (3)
771 Seminar: Public Law (3)

General

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

Psychology

GRADUATE FACULTY
J. M. Digman, Ph.D. (Chairman) —measurement; child personality
A. Arkoff, Ph.D.—clinical
H. M. Bitner, Ph.D.—student counseling
R. J. Blanchard, Ph.D.—comparative, physiological
D. H. Crowell, Ph.D.—infant responsiveness; exceptional children
A. L. Diamond, Ph.D.—psychophysics
A. A. Dole, Ph.D.—individual differences; disability
C. J. Herrick, Ph.D.—student counseling; history of psychology
J. Michel, Ph.D.—counseling
W. F. Oakes, Ph.D.—learning, verbal behavior
H. B. Weaver, Ph.D.—applied; tourist industry
W. R. Wilson, Ph.D.—small groups, communication

AFFILIATE FACULTY
A. Connor, M.D.—infant behavior and growth
H. Gudeman, Ph.D.—clinical

Intended candidates for M.A. or Ph.D. must present 18 hours of undergraduate credit in psychology, including general and experimental psychology and statistics. Related course requirements are mathematics, extending at least through intermediate algebra, and introductory zoology.

No more than 6 credits in courses numbered in the 400-500 series may be counted toward the advanced degree. A maximum of 6 hours may be elected from closely related courses in anthropology, philosophy, physics, sociology and zoology. Additional elective courses will be dependent upon the candidate's background.

The M.A. and Ph.D. degrees are offered in the following fields: general-experimental, social-personality, developmental, and counseling. Candidates for the M.A. in counseling are expected to meet the standards set by the American Psychological Association, including 48 semester credits. Special programs with traineeships are available in developmental and in vocational rehabilitation counseling.

The following courses are required: 620, 630, and either 614 or 615. Intended candidates for the doctorate may, under special circumstances, offer 24 course credits in lieu of the M.A. degree, although all
students without the M.A. degree in psychology from an American university must enter the program initially as intended candidates for the M.A. degree.

Official scores of the aptitude and advanced psychology tests of the Graduate Record Examination and of the Miller Analogies Test are required when applying for admission. Additional details of the departmental programs are presented in a brochure available from the department.

**Psychology**

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>410</td>
<td>History of Psychology (3)</td>
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<tr>
<td>430</td>
<td>Intermediate Experimental Psychology (3)</td>
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<tr>
<td>440</td>
<td>Physiological Psychology (3)</td>
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<tr>
<td>450</td>
<td>Social Development of Children (3)</td>
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<tr>
<td>480</td>
<td>Abnormal Psychology (3)</td>
</tr>
<tr>
<td>512</td>
<td>Comparative Psychology (3)</td>
</tr>
<tr>
<td>574</td>
<td>Problems in Industrial and Business Psychology (3)</td>
</tr>
<tr>
<td>690</td>
<td>Seminar: Problems in Psychology (3)</td>
</tr>
<tr>
<td>614</td>
<td>Theory I (3)</td>
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<tr>
<td>615</td>
<td>Theory II (3)</td>
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<td>579</td>
<td>Quantitative Methods I (3)</td>
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<td>581</td>
<td>Quantitative Methods II (3)</td>
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<td>Quantitative Methods III (3)</td>
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<td>630</td>
<td>Experimental Psychology I (3)</td>
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<td>631</td>
<td>Experimental Psychology II (3)</td>
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<td>Developmental Psychology I (3)</td>
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<td>652</td>
<td>Developmental Psychology II (3)</td>
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<td>Personality (3)</td>
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<td>662</td>
<td>Social Psychology (3)</td>
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<td>670</td>
<td>Applied Social Psychology (3)</td>
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<td>672</td>
<td>Advanced Educational Psychology (3)</td>
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<td>678</td>
<td>Psychology of Occupations (3)</td>
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<td>679</td>
<td>Psychology of Vocational Rehabilitation (3)</td>
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<td>682</td>
<td>Psychological Appraisal A (3)</td>
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<tr>
<td>683</td>
<td>Psychological Appraisal B (3)</td>
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<tr>
<td>684</td>
<td>Psychological Appraisal C (3)</td>
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<td>690</td>
<td>Directed Research (arr.)</td>
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<tr>
<td>730</td>
<td>Directed Research (Experimental) (arr.)</td>
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<td>750</td>
<td>Directed Research (Developmental) (arr.)</td>
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<tr>
<td>760</td>
<td>Directed Research (Personality) (arr.)</td>
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<td>762</td>
<td>Directed Research (Social) (arr.)</td>
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<td>780</td>
<td>Directed Research (Counseling) (arr.)</td>
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<td>782</td>
<td>Psychological Counseling A (3)</td>
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<td>783</td>
<td>Psychological Counseling B (3)</td>
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<td>784</td>
<td>Psychological Counseling C (3)</td>
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<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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**Public Health**

**Graduate Faculty**

- R. K. C. Lee, M.D., Dr. P.H. (Dean) — public health administration
- M. L. Brown, Ph.D. — public health nutrition
- N. C. Burbank, Jr., Sc.D. — environmental health and sanitary engineering
- C. S. Chung, Ph.D. — biostatistics
- D. F. B. Char, M.D. — maternal and child health
- A. Connor, M.D., M.P.H. — maternal and child health
- V. V. Drenckhahn, M.S., M.P.H. — public health education
- B. Gross, M.S. — environmental sanitation
- M. C. W. Kau, D.D.S., M.P.H. — dental health
FIELDS OF STUDY

H. W. Klemmer, Ph.D.—sanitary microbiology
R. E. Mytinger, Dr. P.H.—public health administration
G. F. Schnack, M.D.—mental health
R. F. Shepard, M.D.—chronic diseases
R. Y. Suehiro, M.P.H.—public health administration
N. R. Sloan, M.D., M.P.H.—chronic diseases
G. H. Tokuyama, M.P.H.—biostatistics
E. Voulgaropoulos, M.D., M.P.H.—international health, epidemiology
R. J. Wolff, Ph.D.—behavioral sciences
R. M. Worth, M.D., M.P.H., Ph.D.—epidemiology

AFFILIATE FACULTY
L. Bernstein, M.D., M.P.H.—public health administration
J. Paty, M.P.H.—public health education
L. Rosen, M.D., Dr. P.H.—epidemiology

M.P.H.

The M.P.H. program (Plan B) is designed to train persons for a variety of careers in the broad field of public health at local, state, national, and international levels. Intended candidates must present at least a bachelor's degree in a discipline appropriate to his chosen area of public health in which he plans to be employed. Depending on the student's background and interest, an appropriate course of study is prescribed, incorporating the student's selected area of emphasis. Candidates must complete a minimum of 30 semester hours, including 14 semester hours of required courses (marked with an asterisk below), a comprehensive essay and suitable field training. Students are required to pass a general diagnostic examination on public health before formal admission to candidacy and must pass a final oral examination near the completion of the program.

Traditionally, M.P.H. candidates have been physicians, dentists, veterinarians or other personnel in the health or related professions with at least three years of experience; for these, the program may be completed in one year. The M.P.H. program at the University of Hawaii is open not only to such experienced personnel but also to students with a bachelor's degree or to students with a graduate degree in a health-related science. For students with only baccalaureate degrees and no previous work experience in the health professions, the program usually requires up to two years to complete.

M.S.

The M.S. program is open to persons with at least a bachelor's degree in any of the several sciences basic to public health and who desire intensive research training in some specific aspect of public health. Both Plan A and Plan B are available. Both plans (1) ordinarily require two years to complete, (2) require the passing of a general examination on public health before formal admission to candidacy, (3) require the completion of 14 semester hours of required courses (identical courses required in the M.P.H. program), and (4) usually require some form of appropriate short-term field work. In Plan A the minimum requirement is 24 semester hours plus 6 credits for thesis research, and a final oral examination on
the thesis and related subjects; in Plan B the minimum requirement is 30 semester hours and a final seminar appearance relating to the essay required for PH 710.

Areas of Emphasis

A number of areas of emphasis in the broad field of public health is offered in the M.P.H. and M.S. (Plans A and B) programs. Areas include biostatistics, environmental sanitation, epidemiology, international health, maternal and child health, population dynamics, public health administration, public health education, public health engineering, public health laboratory, and public health nutrition.

Courses

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

- PH 601 Public Health Administration I (3)
- PH 602 Public Health Administration II (3)
- PH 605 Seminar in Medical Care Organization (2)
- PH 610 Infectious Diseases of Man in the Pacific Area (3)
- PH 625 Biostatistics I (3)
- PH 626 Biostatistics II (3)
- PH 630 Public Health Nutrition I (2)
- PH 631 Public Health Nutrition II (2)
- PH 632 Seminar in Public Health Nutrition (1)
- PH 633 Dental Public Health (2)
- PH 636 Environmental Health I (3)
- PH 637 Environmental Control of Disease through Food Protection (2)
- PH 638 Vector Control in Environmental Health (2)
- PH 640 Public Health Education (2)
- PH 641 Seminar in Public Health Education (3)
- PH 651 Principles of Epidemiology (3)
- PH 660 Community Mental Health (2)
- PH 665 Socio-cultural Aspects of Health and Illness (3)
- PH 666 Medical Aspects of Disability (3)
- PH 675 Evaluation and Measurement of Environmental Factors in Health Problems (3)
- PH 680 Maternal and Child Health I (2)
- PH 681 Maternal and Child Health II (2)
- PH 682 The Handicapped Child (2)
- PH 683 Principles of Comprehensive Maternity Care (1)
- PH 685 Demography and World Population Problems (3)
- PH 686 Staff Seminar in Population Dynamics (2)
- PH 687 Fertility and Reproduction (2)
- PH 690 Staff Seminar in Community Health Services (Maternal and Child Health, Public Health Education, Public Health Nursing, Public Health Nutrition, Mental Health) (2)
- PH 692 Seminar in School Health Services (1)
- PH 695 International Health I (1)
- PH 696 International Health II (1)
- PH 699 Directed Research in (area of emphasis) (arr.)
- PH 710 Advanced Public Health Practice in (area of emphasis) (3)
- PH 800 Thesis Research (arr.)

Secondary Education

GRADUATE FACULTY

A. W. S. In, Ph.D. (Chairman) — secondary education, administration, supervision, curriculum
Intended candidates for the M.Ed. must present a minimum of 18 semester hours in professional education courses and, in addition, credit for supervised student teaching or teaching experience.

Admission to candidacy is based upon (1) the quality of the student's undergraduate record; (2) his performance on the general examination; (3) performance on the Aptitude Examination of the Graduate Record Examination (for non-UH College of Education graduates only).

Both Plan A (thesis) and Plan B (non-thesis) are available.

Plan A: The program requires a minimum of 24 semester credits of course work, with a minimum of 14 semester credits in education and a maximum of 10 semester credits in a related field and 6 hours in a thesis. At least one graduate seminar is required. Required courses are Ed SE 635 or 636, 640, Ed EP 708, one of Ed HP 650, 660, or 683, and Ed SE 800.

Plan B: The program requires a minimum of 30 semester credits in course work, with a minimum of 15 hours in education and a minimum of 12 hours in a related field. A project paper is required in lieu of the thesis. The program is primarily designed to enable teachers to strengthen their teaching field majors. At least one graduate seminar is required. Required courses are Ed SE 635 or 636, 640, 733 and one of Ed HP 650, 660 or 683.

CURRICULUM AND INSTRUCTION

<table>
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<th>Credits</th>
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<tbody>
<tr>
<td>634</td>
<td>Extraclass Activities in Secondary Schools</td>
<td>(2)</td>
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<tr>
<td>635</td>
<td>Junior High School Curriculum</td>
<td>(3)</td>
</tr>
<tr>
<td>636</td>
<td>Secondary School Curriculum</td>
<td>(3)</td>
</tr>
<tr>
<td>640</td>
<td>Seminar in Special Methods</td>
<td>(3)</td>
</tr>
<tr>
<td>672</td>
<td>Teaching Aids on Asia</td>
<td>(2)</td>
</tr>
<tr>
<td>679</td>
<td>Supervision of Student Teaching</td>
<td>(2)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research</td>
<td>(arr.)</td>
</tr>
<tr>
<td>735</td>
<td>Seminar in Curriculum</td>
<td>(3)</td>
</tr>
<tr>
<td>737</td>
<td>Foundations in Art Education</td>
<td>(3)</td>
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<tr>
<td>800</td>
<td>Thesis Research</td>
<td>(arr.)</td>
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</tbody>
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Social Work

GRADUATE FACULTY

K. N. Handley, M.S.W. (Director) — social services
H. A. Jambor, D.S.W. — social services, community organization administration
K. Kumabe, M.S.W. — casework, field work
F. C. Merritt, M.S.W. — group work
D. B. Reid, M.S. — field work
G. F. Schnack, M.D. — psychiatry
The School of Social Work offers an accredited two-year M.S.W. program. Inquiries for information and applications for admission should be sent to the office of the School of Social Work. The School publishes an annual bulletin.

The curriculum for the master of social work requires the student to complete a minimum of 48 credits of work including at least 10 credits (750 clock hours) of supervised field work and 6 credits covering research on a group project or individual thesis. The core curriculum, aside from the research sequence, covers three areas: social services, human growth and behavior, and social work methods. The courses in these areas are set up as sequences which continue throughout the two years. The student's program usually includes the following courses:

**Social Services**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>627</td>
<td>Social Services (2)</td>
</tr>
<tr>
<td>628</td>
<td>Social Services (2)</td>
</tr>
<tr>
<td>653</td>
<td>Legal Aspects of Social Work (2)</td>
</tr>
<tr>
<td>656</td>
<td>Social Welfare Organization and Administration (2)</td>
</tr>
<tr>
<td>781</td>
<td>Seminar in Social Welfare Policy (2)</td>
</tr>
</tbody>
</table>

**Human Growth and Behavior**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>610-611</td>
<td>Human Growth and Behavior (3-3)</td>
</tr>
<tr>
<td>775</td>
<td>Advanced Social Psychiatry (2)</td>
</tr>
<tr>
<td>790</td>
<td>Cultural Factors in Social Work Practice (2)</td>
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</tbody>
</table>

**Social Work Methods**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>605-606</td>
<td>Social Casework (2-2), or</td>
</tr>
<tr>
<td>608-609</td>
<td>Social Group Work (2-2)</td>
</tr>
<tr>
<td>612</td>
<td>Group Work Program Activities (1-1)</td>
</tr>
<tr>
<td>615</td>
<td>Community Organization (2)</td>
</tr>
<tr>
<td>660-661</td>
<td>Supervised Field Work (3-3)</td>
</tr>
<tr>
<td>760-761</td>
<td>Advanced Supervised Field Work (4-4)</td>
</tr>
<tr>
<td>765-766</td>
<td>Advanced Social Casework (2-2), or</td>
</tr>
<tr>
<td>770-771</td>
<td>Advanced Social Group Work (2-2)</td>
</tr>
<tr>
<td>777</td>
<td>Community Development in Social Work (2)</td>
</tr>
</tbody>
</table>

**Research**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>652</td>
<td>Social Statistics and Research (2)</td>
</tr>
<tr>
<td>798-799</td>
<td>Seminar in Research (3-3)</td>
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<tr>
<td>800</td>
<td>Thesis Research</td>
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**Sociology**

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Specialization</th>
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</thead>
<tbody>
<tr>
<td>C. K. Cheng, Ph.D. (Chairman)</td>
<td>social institutions, criminology, penology</td>
</tr>
<tr>
<td>H. V. Ball, Ph.D.</td>
<td>sociology of law, penology</td>
</tr>
<tr>
<td>O. Bartos, Ph.D.</td>
<td>theory and small groups</td>
</tr>
<tr>
<td>C. E. Glick, Ph.D.</td>
<td>race relations, collective behavior</td>
</tr>
<tr>
<td>B. L. Hormann, Ph.D.</td>
<td>modernization of peasant peoples, social disorganization</td>
</tr>
<tr>
<td>I. Krauss, Ph.D.</td>
<td>social stratification, urban sociology</td>
</tr>
<tr>
<td>A. W. Lind, Ph.D.</td>
<td>the community, emphasis on race relations</td>
</tr>
</tbody>
</table>
Intended candidates for the M.A. must present a minimum undergraduate preparation of 18 credits in sociology, including Introduction to the Study of Society (151) or Principles of Sociology (201) or the equivalent.

Courses available for graduate credit are listed below. A maximum of 6 credits may be selected from related courses in anthropology, economics, political science, philosophy, or psychology with the approval of the supervising committee.

**Sociology**

- 410 Population and Society (3)
- 435 The Agrarian Community (3)
- 436 The Urban Community (3)
- 444 People and Institutions of China (3)
- 446 People and Institutions of Japan (3)
- 451 Race Relations in the Pacific (3)
- 472 The Family (3)
- 480 Sociology of Religion (3)
- 486 Industrial Sociology (3)
- 490 Social Stratification (3)
- 504 Juvenile Delinquency (3)
- 530 Sociology of Small Groups (3)
- 545 Collective Behavior and Social Movements (3)
- 560 Methods of Social Research (9)
- 570 Social Statistics (3)
- 572 Advanced Social Statistics (3)
- 580 Sociological Theory (3)
- 602 Graduate Seminar (3)
  1. Ecology and Demography
  2. Social Organization
  3. Social Disorganization
  4. The Group and The Person
  5. Social Movements and Social Change
- 628 Seminar in Race Relations (3)
- 652 Seminar in Social Change in Developing Areas (3)
- 654 Seminar in Community Development (3)
- 656 Culture and Communication (3)
- 660 Seminar in Methods of Research (3)
- 680 Seminar in Sociological Theory (3)
- 682 Mathematical Models in Behavioral Science (3)
- 699 Directed Research (arr.)
- 800 Thesis Research (arr.)

**Soil Science**

**Graduate Faculty**

- L. D. Swindale, Ph.D. (Chairman) — soil genesis and classification, physical chemistry
- P. C. Ekern, Ph.D. — soil management, physics
- R. L. Fox, Ph.D. — soil fertility and chemistry
- R. E. Green, Ph.D. — soil physics, soil fertility
- Y. Kanehiro, Ph.D. — soil chemistry, fertility
- D. L. Plucknett, Ph.D. — soil fertility
- G. D. Sherman, Ph.D. — soil genesis and weathering, classification, chemistry
- G. Uehara, Ph.D. — soil physics, mineralogy
- O. R. Younge, Ph.D. — soil management, fertility
Intended candidates for the M.S. or Ph.D. in soil science must have completed a minimum of 18 hours of undergraduate credit in soil science and related subject matter fields and two years of college chemistry. The related subject matter fields are microbiology, chemistry, geography, geology, mineralogy, physics, botany, plant physiology, agronomy, and agricultural engineering (irrigation).

Courses in the major field are to be selected from those listed below. Required courses are marked with an asterisk. Supplementary courses in related fields will be required, as determined by the area of specialization. Candidates may specialize in tropical soil genesis and classification, soil and clay mineralogy, soil management, soil fertility, and the fundamental physical and chemical properties of soils.

**SOIL SCIENCE**

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<td>485</td>
<td>Soil Biotics (3)</td>
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<tr>
<td>*685</td>
<td>Soil Genesis and Formation (3)</td>
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<tr>
<td>686</td>
<td>Advanced Soil Classification (3)</td>
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<td>*687</td>
<td>Soil Science Seminar (1)</td>
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<td></td>
<td>(a) Soil Chemistry</td>
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<td>(b) Soil Physics</td>
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<td></td>
<td>(c) Soil Genesis, Formation and Classification</td>
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<td></td>
<td>(d) Soil Fertility</td>
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<tr>
<td>688</td>
<td>Soil and Clay Mineralogy (3)</td>
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<td>689</td>
<td>Advanced Soil Fertility (4)</td>
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<tr>
<td>690</td>
<td>Advanced Soil Chemistry (arr.)</td>
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<td>699</td>
<td>Directed Research M.S. (arr.)</td>
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<tr>
<td>799</td>
<td>Directed Research Ph.D. (arr.)</td>
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<tr>
<td>800</td>
<td>Thesis Research (arr.)</td>
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### Spanish

**GRADUATE FACULTY**

J. S. Holton, Ph.D. (Chairman) — methods of teaching the language, grammar
E. C. Knowlton, Jr., Ph.D. — history of the language, Hispano-Philippine literature

Intended candidates for the M.A. in Spanish must present 24 semester hours of undergraduate credit in Spanish, excluding introductory and intermediate courses, but including work in Spanish phonetics, Peninsular literature, and Spanish American literature, or equivalent preparation. They must also demonstrate, by means of a personal interview or by a tape recording, that they possess an acceptable accent and a reasonable degree of fluency in Spanish.

Both Plan A and Plan B are available. Under both plans a minimum of 6 and a maximum of 15 credits may be taken from courses in related fields. Some knowledge of Latin is desirable, and one year of a second modern language will be required of those whose basic command of
Spanish was largely acquired in the home. Before admission to candidacy a student must present satisfactory scores on the Proficiency Examinations for Teachers and Advanced Students prepared by M.L.A. and E.T.S. Required courses are marked with an asterisk; those numbered between 400 and 500 not taken as part of the undergraduate preparation must form part of the M.A. program.

**SPANISH**

400-401 Advanced Oral Practice (3-3)
430 Spanish Dialectology (3)
440 History of the Spanish Language (2)
*450 Structure of Spanish (3)
460-461 Modern and Contemporary Spanish Literature (3-3)
480-481 Spanish American Novel (3-3)
*628-629 Stylistics and Advanced Composition (3-3)
659 Seminar in Spanish Linguistics (3)
661 Cervantes (2)
665 Spanish Literature Prior to the Golden Age (3)
670 Spanish Literature of the Golden Age (3)
675 Modernismo (2)
690 Hispano-Philippine Literature (2)
698 Seminar in Hispanic Literature (3)
699 Directed Research (arr.)
800 Thesis Research (arr.)

**HISTORY**

*511-512 History of Hispanic America (3-3)

**LINGUISTICS**

*620 Introduction to Linguistic Analysis (3)
621 Phonemics (3)
622 Morphology and Syntax (3)

**EUROPEAN LANGUAGES**

630 Seminar in Research Methods (2)

**SECONDARY EDUCATION**

335 Foreign Languages, Secondary (3)

**ENGLISH**

635 Seminar in Comparative Literature (3)

**GEOGRAPHY**

521 Geography of Europe (3)

**Speech**

**GRADUATE FACULTY**

B. Aly, Ph.D. (Chairman) — rhetoric, public address
M. Ansberry, Ph.D. — speech pathology, audiology
S. Batkin, M.D. — audiology
E. J. Bilsborrow, Ph.D. — public speaking, speech education, semantics
L. N. Breneman, M.A. — interpretation, speech improvement, speech education
E. B. Carr, Ph.D. — phonetics, phonemics, research methods, oral English for foreign students
M. J. Gordon, M.A. — speech improvement, speech education
P. Heinberg, Ph.D. — speech science, voice science, experimental methods
J. P. Hoshor, Ph.D. — leadership and discussion, semantics
D. W. Klopf, Ph.D. — forensics, debate
V. G. Larson, M.A. — speech education, speech improvement, choral speaking
O. S. Lefforge, Ph.D. — rhetoric, public address
J. R. Linn, Ph.D. — interpretation, speech improvement
L. R. Newcomer, M.A. — public address, speech education, rhetoric
Graduate study in speech at the University of Hawaii is designed to enable students to teach, to do research, and to administer or supervise positions in the areas of oral communication. Such subjects as phonetics, rhetoric, public address, interpretation, voice science, pedagogy, forensics, and radio-television may be explored historically, scientifically, and creatively. Graduate programs are structured to acquaint all students with the field of speech and to provide for a specialty in one area. Every program is planned with a view to employing the intellectual interests and meeting the needs of the student in his own career.

Anyone wishing to pursue studies leading to a master's degree in speech at the University of Hawaii should submit to the department a statement including a transcript of undergraduate studies completed and in progress, the names of his instructors in speech and related areas (e.g., history, philosophy, psychology, linguistics, drama), and a brief statement listing aspirations, areas of interest, and reasons for desiring to undertake graduate study at the University of Hawaii. Every student admitted will be assigned an advisor pro tem, who will assist the student in preparing a tentative study program, subject to revision by the student in consultation with his graduate committee.

Required courses are marked with an asterisk.

The following courses in speech pathology and audiology offered in the College of Health Sciences are also available to qualified students in the department of speech: SPA 600, 601, 602, 603, 610, 611, 621, 630, 640, 641, 650, 699, and 800.

**Speech**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>630</td>
<td>Advanced Interpretative Reading (3)</td>
</tr>
<tr>
<td>440</td>
<td>Semantics (3)</td>
</tr>
<tr>
<td>170</td>
<td>Broadcasting and the Public (3)</td>
</tr>
<tr>
<td>175</td>
<td>Television Program Planning and Production (3)</td>
</tr>
<tr>
<td>480</td>
<td>Group Leadership and Discussion (3)</td>
</tr>
<tr>
<td>485</td>
<td>Argumentation and Debate (3)</td>
</tr>
<tr>
<td>550</td>
<td>Speech Composition (3)</td>
</tr>
<tr>
<td>598</td>
<td>Special Problems (arr.)</td>
</tr>
<tr>
<td>610</td>
<td>Seminar in Phonetics and Speech Science (3)</td>
</tr>
<tr>
<td>615</td>
<td>Phonetics and Phonemics of American English (3)</td>
</tr>
<tr>
<td>616</td>
<td>Special Problems in Phonetics and Phonemics of American English (3)</td>
</tr>
<tr>
<td>630</td>
<td>Seminar in Interpretation (3)</td>
</tr>
<tr>
<td>650</td>
<td>Seminar in Rhetoric and Public Address (3)</td>
</tr>
<tr>
<td>651</td>
<td>History and Criticism of British Oratory (3)</td>
</tr>
<tr>
<td>652</td>
<td>History and Criticism of American Oratory (3)</td>
</tr>
<tr>
<td>653</td>
<td>Classical Rhetorical Theory (3)</td>
</tr>
<tr>
<td>670</td>
<td>Seminar in Broadcast Program Criticism and Social Effects (3)</td>
</tr>
<tr>
<td>*690</td>
<td>Seminar in Research Methods (3)</td>
</tr>
<tr>
<td>699</td>
<td>Directed Research (arr.)</td>
</tr>
<tr>
<td>*800</td>
<td>Thesis Research (arr.)</td>
</tr>
</tbody>
</table>
Intended candidates for the M.S. degree in speech pathology and audiology must present a minimum of 27 undergraduate credits in the area including basic courses in speech correction, methodology, pathology of speech, audiology, testing of hearing, speech and hearing science and phonetics as well as courses in practicum in both speech pathology and audiology. A minimum of 9 credits in psychology including courses in developmental psychology and psychology of adjustment are required. Deficiencies in undergraduate preparation must be removed without credit.

Two programs are offered for graduate study: Plan A, thesis; and Plan B, non-thesis. Under Plan A, 36 credits in speech pathology and audiology and allied fields plus a thesis are required. If Plan B is chosen by the student and the advisory committee, 44 credits of course work must be completed as a graduate student. Either of these programs will enable the student to meet the basic requirements for the certificate of clinical competence in both speech pathology and audiology as established by the American Speech and Hearing Association. The full-time graduate student should plan to be in residence a minimum of three semesters and two summer sessions; normally two academic years are required.

Specialized courses offered at the graduate level include:

- SPA 600 Organic Disorders of Speech (3)
- SPA 601 Auditory Training and Speech Reading (3)
- SPA 602 Functional Disorders of Speech (3)
- SPA 603 Language Development for Children with Hearing Deficiencies (3)
- SPA 610 Advanced Practicum in Speech Pathology (3)
- SPA 611 Advanced Practicum in Audiology (3)
- SPA 621 Advanced Audiology (3)
- SPA 630 Research Methods (3)
- SPA 640 Seminar in Speech Pathology (3)
- SPA 641 Seminar in Audiology (3)
- SPA 699 Research (1-4)
- SPA 800 Thesis (6)

Teaching of English as a Second Language

- R. C. Sittler, Ph.D. (Chairman) — teaching English as a second language; Romance linguistics
- Bower Aly, Ph.D. — rhetoric and public address
- B. W. Bender, Ph.D. — Micronesian languages and linguistics; applied linguistics
- C. S. Bouslog, Ph.D. — English romanticism; twentieth century British and American literature
- E. B. Carr, Ph.D. — phonetics and phonemics; research methods
- R. H. Crymes, Ph.D. — English grammar; methods of teaching English as a second language
- Marcella Frank, Ed.D. — English grammar; methods and materials in teaching English as a second language
- P. J. Heinberg, Ph.D. — automated instruction; experimental phonetics
- D. M. Topping, Ph.D. — Micronesian languages and linguistics; applied linguistics
- S. M. Tsuzaki, Ph.D. — Romance languages and linguistics
The master of arts in the teaching of English as a second language is an interdepartmental graduate program contributed to by the departments of English, linguistics, and speech. Available to both foreign and American graduate students, this is a 36-semester hour, non-thesis program with major emphasis on applied linguistics and linguistic methods of teaching English. Competence in speaking, understanding, reading, and writing English is prerequisite and in the case of foreign students must be certified by English language experts in the students' own country at the time of application for admission. Required program courses are listed below; additional information relating to courses in a minor area, to elective courses, and to other program requirements is available in a program brochure.

**ENGLISH**
- 425 Modern English Grammar (3)
- 622 Teaching English as a Second Language (3)
- 723 Textbook and Test Construction (3)

**LINGUISTICS**
- 620 Introduction to Linguistic Analysis (3)
- 720 Seminar in Applied Linguistics (3)

**SPEECH**
- 615 Phonetics and Phonemics of American English (3)

**Zoology**

**GRADUATE FACULTY**
- A. J. Berger, Ph.D. (Chairman) - ornithology, anatomy
- J. E. Alicata, Ph.D. - parasitology
- A. H. Banner, Ph.D. - invertebrate zoology, systematics
- V. E. Brock, M.A. - fishery biology, oceanography
- T. C. Cheng, Ph.D. - physiological parasitology
- G. W. Chu, Ph.D. - parasitology
- H. W. Frings, Ph.D. - sensory physiology, behavior
- W. A. Gosline, Ph.D. - ichthyology, zoogeography and evolution
- P. Helfrich, Ph.D. - ichthyology, ecology
- R. W. Hiatt, Ph.D. - ecology, marine biology
- S. C. Hsiang, Ph.D. - experimental embryology, comparative anatomy
- F. I. Kamemoto, Ph.D. - physiology, endocrinology
- E. A. Kay, Ph.D. - malacology
- D. C. Matthews, Ph.D. - invertebrate zoology, protozoology
- B. S. Muir, Ph.D. - fishery biology, population dynamics
- M. D. Rayner, Ph.D. - muscle-nerve physiology
- E. S. Reese, Ph.D. - behavior, ecology, invertebrate zoology
- T. A. Rogers, Ph.D. - vertebrate physiology
- A. L. Tester, Ph.D. - fishery biology, biometry, behavior
- S. J. Townley, Ph.D. - invertebrate zoology, ecology, radiobiology
- L. D. Tuthill, Ph.D. - taxonomy
- P. B. van Weel, Ph.D. - physiology, physiological ecology

**AFFILIATE FACULTY**
- Y. Kondo, Ph.D. - malacology
- J. S. Hendrickson, Ph.D. - vertebrate zoology
- J. J. Magnuson, Ph.D. - population dynamics, fish behavior
- J. C. Marr, M.A. - fishery biology, population dynamics
- B. S. Rothschild, Ph.D. - fishery biology
- D. W. Strasburg, Ph.D. - ichthyology
- M. Takata, M.S. - fishery biology
Intended candidates for the M.S. or Ph.D. in zoology must present a minimum of 18 hours of undergraduate preparation in zoology, including courses in vertebrate zoology (including comparative anatomy), embryology, and physiology. M.S. candidates should have completed two years of chemistry (inorganic and organic), and courses in college algebra and botany. In addition, Ph.D. candidates should have completed one year of physics. Deficiencies in undergraduate preparation must be made up. An official record of the student's performance on the Graduate Record Examination (Aptitude Test and the Advanced Test in Biology) must be submitted to the Dean of the Graduate Division before any action will be taken on applications for admission.

Courses are listed below. One seminar each year is required. Other required courses are marked with an asterisk (602 is not required for the M.S. under Plan B). For the M.S. under Plan A a maximum of 6 hours, and under Plan B a minimum of 6 hours may be elected from related courses in botany, chemistry, entomology, genetics, mathematics, meteorology, oceanography, and physics. For the Ph.D., additional work will be stipulated by the supervising committee.

**ZOOL OGY**

401 Principles of Ecology (2)
410 Parasitology (3)
416 Histology (3)
425 Microtechnique (3)
431 Biometry (3)
432 Advanced Biometry (3)
441 History of Zoology (2)
450 Natural History of the Hawaiian Islands (2)
460 Avian Biology (3)
504 Animal Evolution (2)
505 Endocrinology (2)
510 Biology of Symbiosis (4)
525-526 General Ichthyology (3-3)
*602 Preparation of Scientific Manuscripts (1)
603 Zoogeography (2)
605 Comparative Endocrinology (4)
606 Animal Behavior (3)
607 Physiological Bases of Animal Behavior (3)
608 Growth and Form (4)
611 Principles of Systematic Zoology (3)
615-616 Advanced Invertebrate Zoology (3-3)
620 Marine Ecology (3)
621 Physiological Ecology (3)
622 Isotopic Tracers in Biology (3)
629 Methods of Fishery Investigation (3)
631 Population Dynamics (3)
645 Advanced General Physiology (3)
646 Comparative Invertebrate Physiology (3)
691 Seminar in Zoology (1)
692 Seminar in Fisheries Biology (1)
699 Directed Research (arr.)
732 Fisheries Management (3)
*800 Thesis Research (arr.)
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