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1963-64 CALENDAR

First Semester

September 16-17, Monday and Tuesday: Orientation of freshmen
September 16, Monday: Registration of seniors
September 17, Tuesday: Registration of juniors
September 18, Wednesday: Registration of sophomores
September 19-20, Thursday and Friday: Registration of freshmen
September 21, Saturday: 8:00 A.M. to 2:00 P.M. Registration of graduate and unclassified students and auditors
September 23, Monday: Instruction begins
September 28, Friday: Last day of registration for credit
October 14, Monday: Last day of withdrawal from courses without "grade" penalty
November 1, Friday: First deficiency reports due
November 11, Monday: Veterans' Day (holiday)
November 27, Wednesday: Last day for removal of "Incompletes"
November 28-30, Thursday through Saturday: Thanksgiving recess
December 6, Friday: Second deficiency reports due
December 9, Monday: Last day for withdrawal from courses
December 21, Saturday: Last day before Christmas recess
January 6, Monday: Instruction resumes
January 21, Tuesday: Last day of instruction, first semester
January 22, Wednesday: Final examinations begin
January 28, Tuesday: First semester ends

Second Semester

February 4, Tuesday: Registration of seniors and juniors
February 5, Wednesday: Registration of sophomores
February 6-7, Thursday and Friday: Registration of freshmen
February 8, Saturday: 8:00 A.M. to 2:00 P.M. Registration of graduate and unclassified students and auditors
February 10, Monday: Instruction begins
February 14, Friday: Last day of registration for credit
February 22, Saturday: Presidents' Day (holiday)
March 2, Monday: Last day of withdrawal from courses without "grade" penalty
March 20, Friday: First deficiency reports due
March 25, Wednesday: Last day for removal of "Incompletes"
March 26, Thursday: Prince Kuhio Day (holiday)
March 27, Friday: Good Friday (holiday)
March 28-April 4, Saturday through Saturday: Easter recess
May 1, Friday: Second deficiency reports due
May 4, Monday: Last day for withdrawal from courses
May 30, Saturday: Memorial Day (holiday)
June 2, Tuesday: Last day of instruction
June 3, Wednesday: Final examinations begin
June 10, Wednesday: Second semester ends
June 14, Sunday: Commencement

Summer Session

June 29, Monday: Registration day for Summer Session
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GENERAL INFORMATION

The University of Hawaii is located in the city of Honolulu on the island of Oahu. Because of the geographic position of the Hawaiian Islands near the center of the Pacific Ocean, it enjoys one of the most equable climates of the world. Multiple, peaceful migrations of people from many portions of America, Asia, and Europe have resulted in an extremely varied, cosmopolitan population which is renowned for its lack of racial, religious, or other social frictions and a resulting social and cultural amalgam which is unique.

The University has many natural advantages for excellence in various fields of intellectual interest. Because of its position and the nature of the population, Hawaii is truly a gateway between the Orient and America. Many facets of both cultures can, therefore, be experienced as well as studied in a benign milieu. Because the Islands have a highly developed mechanized industry, including agriculture, it is also possible to experience and study modern technical and scientific fields. Graduate programs are approved only in fields in which the University can offer a program of high quality. The various fields in which the master's and doctoral degrees are offered are listed under the discussion of the degrees.

The Sinclair Library at the University contains 335,000 bound volumes and 838,000 unbound parts and pamphlets and serves as a depository for government publications. Included in the Library are extensive collections of research materials relating to the Pacific and the Far East. The Oriental Library contains 110,000 items. Publications in Chinese, Japanese, and Russian are catalogued in English, and limited translation facilities are available. Other excellent collections in Honolulu open to graduate students are the Library of Hawaii, a general public library in downtown Honolulu; the reference library at the Bishop Museum; the Hawaiian Mission Children's Library, with material on missionary activities in the Pacific; the Public Archives, emphasizing Hawaiian history; the library of the Honolulu Academy of Arts; and the scientific libraries of the Hawaiian Sugar Planters' Association, the Pineapple Research Institute, and the Honolulu Biological Laboratory of the U. S. Fish and Wildlife Service.

Various organized research activities of the University offer outstanding possibilities for graduate study and research. Among these are the Hawaii Marine Laboratory which, through its branches at Waikiki and Kaneohe Bay, provides facilities for experimental and inshore research in the various aspects of marine biology. The newly completed building of the Institute of Health Research includes facilities for research in genetics, microbiology, biochemistry, parasitology, and experimental psychology. The new physical
facilities of the Hawaii Institute of Geophysics, which will be completed in 1963, will offer excellent facilities for research in the solid-earth sciences, meteorology, oceanography, and astro-geophysics.

**Graduate Faculty**

The Graduate Faculty is composed of those members of the instructional and research staff of the University who, because of training, interest, experience, and scholarly activity, are selected to assist candidates for advanced degrees in their endeavors. The resident Graduate Faculty is supplemented in many Fields of Study by scholars in other research institutions in Honolulu. These persons constitute the Affiliate Graduate Faculty and serve in all capacities of the resident faculty except as chairman of a thesis or program committee. Members of the Graduate Faculty are listed under the appropriate Field of Study. All members are eligible to serve on program and thesis committees in any Field of Study with the approval of the chairman of that field.

**Admission**

American Residents. Students with baccalaureate degrees from accredited American institutions of higher learning may be admitted to the Graduate School. Persons who do not intend to work for an advanced degree may be admitted as unclassified students, and in lieu of official transcripts may submit a certification of their having been awarded the baccalaureate degree. A form for such certification may be obtained from the Office of the Graduate School. Those wishing to work for an advanced degree must submit a formal application and official transcripts of undergraduate and previous graduate records to the Dean of the Graduate School. Ordinarily, no one will be admitted as an intended candidate unless he can demonstrate an adequate undergraduate background in the major and related fields in which the degree is to be taken, and has an average grade of B or better for all undergraduate courses in the major, or in all courses taken during the last two years of undergraduate work. Those who fail to meet these standards may be allowed to register as probational unclassified graduate students for a semester in order to demonstrate whether or not they can do satisfactory work at the graduate level. If this semester's work is adequate, the Graduate Faculty of the Field of Study may recommend that the undergraduate grade requirement be waived. Graduates of institutions other than the University of Hawaii may also be requested to supply the results of the Graduate Record Examination. Various of the Faculties require the Graduate Record Examination of all applicants. Admission to the Graduate School simply permits registration in graduate courses for which the student's previous training has prepared him.

Graduate students carrying a course load of 10 or more credits must file a medical record form with the Student Health Service.
Applications for admission must be received by July 15 or December 15 to ensure consideration for the succeeding semester.

**Foreign Residents.** Students with baccalaureate degrees from accredited institutions of higher learning may be admitted to the Graduate School. All foreign students must submit a formal application and official transcripts of previous educational records to the Dean of the Graduate School. A record indicating a minimum level of achievement of B or the equivalent is required for admission. In very unusual circumstances, a student who fails to meet these standards may be allowed to register as a probational unclassified graduate student for a semester in order to demonstrate whether or not he can do satisfactory work at the graduate level. If this semester's work is adequate, the Graduate Faculty of the appropriate Field of Study may recommend that the requirement be waived. Students who have a record adequate for admission but whose previous academic work was in an institution which is not recognized by the University of Hawaii may be admitted on a probational unclassified basis upon the recommendation of the Graduate Faculty of the appropriate Field of Study.

In addition to the academic requirements for admission to the Graduate School, all foreign students must have a proficiency in oral and written English which will allow them to pursue work at the graduate level. Therefore, all applicants from foreign countries where the English language is not the usual means of communication are required to file with the Dean of the Graduate School a certificate of proficiency in English. This certificate is issued by the nearest United States consulate, and applicants must make their own arrangements with the consulate to take the examination.

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 the English language. Those found to be in need of further training in English may be assigned to the Institute for a full-time or part-time program. The Institute offers intensive noncredit training in reading, writing, speaking, and listening. Students linguistically capable of carrying on graduate-level work will be so certified to the Dean of the Graduate School and allowed to enroll for a full-time credit program. 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.

In order to be admitted, all foreign students must present positive evidence of adequate financial support during their expected stay at the University. They must also submit results of a medical examination on a form provided by the University. Examination of the form and approval by the University medical doctor is required before admission is completed. In addition, foreign students must carry accident and medical insurance coverage during their stay at the University.
Admission to the Graduate School simply permits registration in graduate courses for which the student's previous training has prepared him and does not insure admission to candidacy for an advanced degree.

Applications for admission must be received by July 15 or December 15 to ensure consideration for admission for the succeeding semester.

**Admission to Candidacy**

Admission to candidacy for an advanced degree, after the student has enrolled in the University, requires the recommendation of the graduate faculty of the major field of study. Intended candidates must indicate this intention at registration, so that the Graduate Faculty may be notified of this intention and a preliminary conference can be scheduled.

The Graduate Faculty of the Field of Study or a committee of the Faculty shall at a preliminary conference: (1) determine whether the student seems to have the ability to pursue graduate work within the particular field of study, (2) determine through scrutiny of the student's record whether his undergraduate background in the field is adequate, (3) specify any courses that the candidate should take in order to meet inadequacies in undergraduate preparation or to complete the requirements for the advanced degree. The faculty or committee shall further (1) supervise the general examination required before admission to candidacy in the master's programs, (2) recommend to the Dean of the Graduate School that the applicant be either admitted to candidacy or denied admission to candidacy, (3) approve the approximate title of the thesis research, and suggest the composition of the thesis committee.

Intended candidates for advanced degrees will not be admitted to candidacy if they obtain more than two failing grades (below B) in courses taken as a graduate student, including those taken to remove undergraduate deficiencies at the University of Hawaii. Because of special difficulties sometimes encountered by foreign students, this rule may be waived for such students the first semester of attendance at the University upon request of the Graduate Faculty of the Field of Study.

Any graduate student who, having been admitted to candidacy for an advanced degree, fails to obtain a grade of B or better in any two of the courses forming part of his program for the advanced degree is automatically dropped from candidacy. A student thus dropped from candidacy reverts to unclassified status and may only be readmitted to candidacy after consideration by the entire Graduate Faculty of the Field of Study, approval of a majority of such faculty, and successful reperformance on the general examination.

**Registration and Grades**

Sixteen credit hours in a semester and 7 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 is 12 credit hours (6 for graduate assistants and research assistants). Graduate teaching assistants and assistants in research, whose duties ordinarily require 20 hours per week, are restricted to 9 hours of course work for credit (including thesis research 800). Minimum registration is for one credit hour. No non credit registration in 800 is allowed.

Registration after the official designated period is permitted only in exceptional cases for valid reasons, and 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 School, (2) subsequent to 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 of registration is made on an official blank issued by the Office of the Graduate School. This blank must be returned to the Office of Admissions and Records bearing the required signatures.

Complete withdrawal from the University is applied for on a form issued by the Office of Admissions and Records, and this blank must be returned to that office with the proper signatures. During the first three weeks of a semester, a formal withdrawal is marked W on the student’s record. A withdrawal at a later date, but prior to the last four weeks of class instruction in a semester, is marked W if the work of the student in the course was passable; otherwise, it is marked F (for failure). No withdrawals from courses are permitted during the last four weeks of instruction in a semester, but the Dean may permit complete withdrawal from the University for legitimate reasons. A student who ceases to attend a course without complying with the official withdrawal procedure receives a failure in the course.

The Graduate School reserves the right to deny further registration to any student whose work is below the required level.

Seniors in the University of Hawaii may carry a limited amount of work for graduate credit 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 the courses for which graduate credit is desired carry graduate credit in the major field. For such graduate course credit to be available for possible application toward an advanced degree written approval of the Dean of the appropriate undergraduate College and of the Graduate School must be obtained at the time of registration for the course.

Graduate students may obtain credit by examination in courses numbered 400-599 with the approval of the Qualifying Committee, Thesis Committee or Program Committee, the instructor concerned, and the Dean of the Graduate School, 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.

No graduate credit is allowed for correspondence courses.
Under no circumstances are courses in directed research to be used to make up undergraduate deficiencies.

Courses numbered 600–799 are intended primarily for graduate students. Courses numbered 400–599 are undergraduate courses which also may carry graduate credit. No course which is required for an undergraduate major may be used for graduate credit in that field of study. Graduate students are graded on a scale of A to F. A grade of A or B must be earned in any course to secure graduate credit. No credit is granted for thesis research courses (number 800 in each field) until the thesis has been accepted. The thesis is graded H (honors) or S (satisfactory). Failure to make satisfactory progress on a thesis does not entitle a student to refund of tuition fees.

A candidate or an intended candidate for an advanced degree taking a course in the College of General Studies for which he desires credit toward his degree must have the approval of his advisor and the Dean of the Graduate School at the time of registration. Cards for indication of such approval are available from the Office of the Graduate School or the College of General Studies. Although the requirements for a degree may be completed at any time during the year formal award of degrees is limited to the end of the two semesters.

**Responsibility**

Students admitted to the Graduate School are assumed to be mature adults and are expected to comport themselves as such. Although the various advisory committees and individuals provided for in the operation of the various graduate programs have the responsibility of assisting the student, he has the primary responsibility for following the procedures and completing various steps in his program in good order and by the stipulated dates. Failure of an advisor to remind a student of a requirement or deadline date will not constitute an acceptable basis for waiver of the requirement. Requirements of the Graduate School, both procedural and substantive, may be waived only by written request of the committee concerned and must have the signature of an authorized member of the Graduate School Office to be official.

**Tuition and Fees**

Tuition and registration fees for graduate students are the same as those for undergraduates. Students registered for 12 or more credit hours in any semester pay $85.00 for tuition and $10.00 for registration per semester. Students registered for fewer than 12 credit hours in any semester pay $8.00 per credit hour, including audited courses. Summer session students pay $10.00 per credit hour, a $5.00 registration fee, and an activities fee of $2.00. Students registered in the College of General Studies pay fees as indicated in the bulletins of that College. Laboratories and course fees vary with the individual course. All students registered for daytime courses pay a Student
Health Fee of 75 cents each semester. Persons who register after the announced days of registration pay a late registration fee of $5.00.

A fee of $2.00 is charged for each change of registration after the official registration period, unless such changes are due to the result of actions of the University.

All recipients of advanced degrees are required to pay a diploma fee of $5.00 and an additional fee of $4.00 to cover the cost of binding two copies of the thesis.

Living Accommodations and Expenses

There are no housing facilities on campus for graduate students. However, the University maintains a file of rooming houses, single rooms in private homes, and apartments. Information on housing and food costs for out-of-state students is available from the Graduate School Office.

The University cafeteria serves three meals a day, six days a week, at an average cost of $2.50 per day.

Minimum expenses of the off-Island student are estimated at $2,000 per academic year for board, room, tuition, registration, course fees, and books. These estimates do not include the cost of clothing, laundry, transportation, and other personal items.

Graduate Assistantships and Scholarships

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 laboratory assistants and carry a limited program of study. The initial remuneration is $2,184 payable in twelve monthly installments. The period of service is September 1 to June 15. Applications should be addressed to the Dean of the Graduate School and should be filed before March 1. Each application must be accompanied by a transcript of academic record, a photograph, and three letters of recommendation from professors under whom the applicant has taken his major courses. A few half-time research assistantships are available for graduate students in agriculture. Inquiries and applications for these should be addressed to the Dean of the College of Agriculture. Half-time graduate teaching and research assistants are exempt from registration and tuition fees for a maximum of 9 credit hours; they must be registered in at least 6 credit hours of work each semester.

Half-time research assistantships are available in various fields in connection with research contracts or grants which are supervised by members of the faculty. Inquiries concerning such assistantships should be addressed to the Chairman of the appropriate Field of Study.
In order to further cultural interchange between East and West, the East-West Center has made available a number of grants to students from the United States who are interested in those fields of study which relate to Asia and the Pacific. American students interested in applying for such an East-West Center grant should write directly to the Admissions Secretary, East-West Center, University of Hawaii, Honolulu 14, Hawaii.

The only scholarships available for foreign students are those provided by the East-West Center. These are available to students from Asia (Japan to Pakistan) and the Pacific islands, including Australia and New Zealand. To apply for an East-West Center grant, a student from abroad should write or call upon the United States Information Service Office or some comparable American facility closest to him.
DEGREES, REQUIREMENTS AND PROCEDURE

Master's Degrees

The University of Hawaii confers the degrees of Master of Arts, Master of Business Administration, Master of Education, Master of Fine Arts, Master of Science, and Master of Social Work.

The Master of Arts is offered in:
- Anthropology
- Mathematics
- Art
- Music
- Asian Studies
- Overseas Operations
- Drama and Theatre
- Pacific Islands Studies
- Economics
- Philosophy
- English
- Political Science
- French
- Psychology
- Geography
- Sociology
- German
- Speech
- History
- Teaching of English as a
- Japanese
- Second Language

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

The Master of Fine Arts is offered for creative production rather than research in:
- Art
- Drama and Theatre
- Music
The Master of Social Work is offered by the School of Social Work.

Following are the minimum requirements for the master's degrees. Additional requirements are stated by fields of study in the latter portion of this Bulletin.

Residence

The minimum residence requirement is two semesters of full-time work or four six-week summer sessions. However, only the exceptionally well-prepared student is able to complete the requirements for the degree in this minimum time. 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 reconsidered by the appropriate Graduate Faculty and be readmitted to candidacy before they can proceed. All work must be completed within the 7 years preceding the date upon which the degree is conferred.

Course Requirements

A maximum of 8 semester hours of graduate credit may be transferred from accredited institutions upon recommendation of the Graduate Faculty no later than admission to candidacy. For the M.A., M.B.A., M.Ed., and M.S., two plans of procedure are available.

Plan A (Thesis)

Plan A is available in all fields of study except the following: Overseas Operations, Public Health, and Teaching of English as a Second Language.

A minimum of 24 credit hours of course work and 6 credit hours of thesis research are 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 (699 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 weeks summer term need not be registered during the subsequent fall semester. Candidates may finish their work during the summer only if their full Thesis Committee is present.

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 Office of the Graduate School the candidate's name, the proposed thesis
title, and recommendations for a thesis committee, including one member from outside the major field of study. The thesis committee, appointed by the Dean of the Graduate School, subsequently approves the thesis outline and forwards three signed copies to the Office of the Graduate School for consideration by other referees and revision or approval. After approval of the outline, the candidate may register for the thesis research course (800). The thesis outline approved by the Thesis Committee must be submitted to the Office of the Graduate School by December 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 outline to the Office of the Graduate School 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).

A 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 thesis 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 thesis, and (2) a representative of the related field is placed on the student's thesis committee.

After the thesis committee has been appointed, the candidate should look to the chairman of this committee for primary direction regarding research methods and the preparation of results. It is the responsibility of 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 thesis. A brochure on instructions for thesis preparation is available at the Office of the Graduate School.

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 School before the close of the session in which the degree is conferred.

A majority of the members of the thesis committee must approve both the thesis and the examination on the thesis. A minority member has the right of appeal to the Graduate School Council for a final decision. The chairman must ensure that the final form of the thesis, including revisions and amendments agreed upon, is acceptable to a majority of the committee. The committee members express their approval or disapproval on a special form issued by the Office of the Graduate School.

Chairmen of graduate Fields of Study have the privilege of being ex-officio members of all thesis committees in the field.

Examinations. In addition to all examinations in courses for which they desire credit, a general examination in the chosen field of graduate
study is required of each intended candidate for the master's degree. It is intended to be not only evaluative, but also diagnostic in character and should therefore be taken as early in the program as possible so that areas of weakness discovered may be rectified. It should be completed by the end of the first semester, but in any case must be completed successfully before admission to candidacy. Students who fail the general examination may repeat it with approval of the Graduate Faculty of the Field of Study. A second failure on the examination will deny the student further consideration for candidacy.

A final oral examination upon the thesis and related material, conducted by the thesis committee and open to all faculty members, is required. As an alternative, the committee chairman may have the candidate present the results of the thesis at a departmental graduate seminar, but all members of the thesis committee must be present. Candidates must notify the Office of the Graduate School at the beginning of the semester or summer session in which the work is to be completed, and arrangements for the final examination must be made at least one month prior to the end of the term.

**Summary of Procedure**

1. Application for admission to the Graduate School
2. Filing of notice of intention to work for a degree
3. Preliminary conference
4. Appointment of interim advisor
5. General examination
6. Admission to candidacy and appointment of thesis committee
7. Approval of thesis problem
8. Thesis submitted to committee
9. Final examination
10. Thesis copies filed
11. Granting of the degree

**Plan B (Nonthesis)**

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

- Agricultural Economics
- Art
- Asian Studies
- Biochemistry
- Civil Engineering
- Economics
- Education
- Electrical Engineering
- Food Science
- Geography
- Geological Sciences
- German
- History
- Horticulture

- Mathematics
- Microbiology
- Music Education
- Overseas Operations
- Philosophy
- Physics
- Plant Pathology
- Political Science
- Public Health
- Sociology
- Speech
- Teaching of English as a Second Language
- Zoology

A minimum of 36 (30 in Engineering) 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 which shall be from a Field of Study other than the major. The Program Committee plans and approves a coherent program of courses for the candidate and sends a copy of the program to the Graduate School. Courses taken which are not included in the approved program will not be counted toward the degree. The program is to be approved and submitted to the Office of the Graduate School before the student has completed more than 15 hours of credit which is to be part of the master's program.

**Examinations.** In addition to all examinations in courses for which they desire credit, a general examination in the chosen field of Graduate Study is required of each intended candidate for the master's degree. It is intended to be not only evaluative, but also diagnostic in character and should therefore be taken as early in the program as possible so that areas of weakness discovered may be rectified. It should be completed by the end of the first semester, but in any case must be completed successfully before admission to candidacy. Students who fail the general examination may repeat it with approval of the Graduate Faculty of the Field of Study. A second failure on the examination will deny the student further consideration for candidacy. 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. Candidates must notify the Office of the Graduate School at the beginning of the semester or summer session in which the work is to be completed.

**Summary of Procedure**
1. Application for admission to Graduate School
2. Filing of notice of intention to work for a degree
3. Preliminary conference
4. Appointment of interim advisor
5. General examination
6. Admission to candidacy and appointment of Program Committee
7. Completion of course work
8. Seminar appearance and examination
9. Granting of the degree

**Doctor of Philosophy**

The degree Doctor of Philosophy is the highest conferred in course. It is a research degree and is conferred only for scholarly attainment and an original contribution to knowledge in a special field. Only the exceptional applicant will be admitted to the doctoral program.

Candidates are accepted only in fields of study in which the teaching staff, library, laboratory equipment, and co-operative relationships with other research institutions make it possible to offer thorough training. These are:
Agricultural Economics  | Horticulture  
Anthropology      | Meteorology  
Biochemistry      | Microbiology  
Botany            | Philosophy   
Chemistry         | Physics      
Entomology        | Political Science 
Genetics          | Psychology   
Geological Sciences| Soil Science  
History           | Zoology      

Minimum requirements are stated below. Additional requirements are stipulated by faculties of the Fields of Study.

**Residence and Credit**

The comprehensive knowledge expected of the student in his major field is such that the requirements for the degree demand not less than six semesters of full-time work or the equivalent, at least three of which must be in residence at the University of Hawaii. While the experienced and exceptionally prepared student may meet the requirements by completing a minimum of 72 credit hours of course work, including research (12 credit hours is the official minimum full-time load), many students will have deficiencies in preparation or have requirements for proper training such that a greater time will be necessary for the completion of the degree. At least three semesters of full-time course work must be completed at the University of Hawaii.

Additional requirements including specific course requirements are determined by the Graduate Faculty of each Field of Study. Their general requirements are indicated under the headings of the various Fields of Study in this Bulletin. Additional requirements for programs of individual students are established by the Graduate Faculty and the Thesis Committee.

Two semesters credit may be allowed toward the doctorate for a master's degree, if it is germane.

Candidates must be registered for the appropriate thesis research course (800) during the entire semester in which the work for the degree is to be completed.

**Language Requirement**

A knowledge of two foreign languages sufficient to make the literature in the languages available to the student is required. The Graduate Faculty of the Field of Study shall determine the languages most appropriate for each student and notify the Dean of the Graduate School of the languages selected. Examinations for proficiency in all languages are to be of a nature to determine that the student is able, with the aid of a dictionary, to read comprehensively and with reasonable speed research materials in his field of interest. The examiners (the faculty of the suitable language department) are to determine that the student is able to make a good, intelligent translation. Further, it is expected that the various graduate faculties will indicate suitable materials to the language departments for use in examinations. The language
departments should attempt to determine that the materials used in different fields will require the same level of proficiency.

Examinations are given three times per year as announced by the Graduate Office.

Certification of proficiency in one of the required foreign languages must be obtained prior to admission to candidacy. Certification of proficiency in both required languages must be deposited in the Office of the Graduate School before the candidate will be permitted to take the comprehensive examination.

Doctoral candidates from foreign countries where the English language is not the language normally used in the school system may use English as one of the foreign languages required.

Examinations

In addition to the regular course examinations, doctoral candidates must pass a comprehensive examination and a final oral examination in defense of the thesis. The comprehensive examination, which may be oral or oral and written, must include an examination in the major field and one or more minor fields, the latter represented by a member or members of the Thesis Committee. Students who fail the comprehensive examination may repeat it with the approval of the Graduate Faculty of the Field of Study. A second failure on the examination will deny the student further consideration for candidacy. At least eight months must elapse between the satisfactory completion of the comprehensive examination and the final examination. Arrangements for the final examination must be made at least one month in advance, and it must occur at least two weeks before the end of the session.

Thesis and Thesis Committee

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 thesis problem has been approved by the Graduate Faculty of the Field of Study, the chairman of the Field of Study sends to the Office of the Graduate School the candidate’s name, the proposed thesis title, and his recommendations for a thesis committee of at least five members including representatives of the minor field or fields. The Thesis Committee, appointed by the Dean of the Graduate School, determines necessary additional course work, advises in the research, and conducts the comprehensive and final examinations. The Committee also must approve the thesis outline and forward three signed copies to the Office of the Graduate School for consideration by other referees and revision or approval determined by the Dean. Information on the preparation of the thesis outline is available in the Office of the Graduate School. After approval of the outline, the candidate may register for the thesis 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 thesis 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 thesis, and (2) a representative of the related field is placed on the student's thesis committee.

After the thesis committee has been appointed, the candidate should look to the chairman of this 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 is available at the Office of the Graduate School.

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 School before the close of the session in which the degree is to be conferred.

A majority of the members of the thesis committee must approve both the thesis and the examination on the thesis. A minority member has the right of appeal to the Graduate School Council for a final decision. The chairman must ensure that the final form of the thesis, including revisions and amendments agreed upon, is acceptable to a majority of the committee. The committee members express their approval or disapproval on a special form issued by the Office of the Graduate School.

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

Summary of Procedure

1. Application for admission to the Graduate School
2. Filing of notice of intention to work for a degree
3. Preliminary conference
4. Appointment of interim advisor
5. Certification of proficiency in one foreign language
6. Admission to candidacy and appointment of thesis committee
7. Approval of thesis proposal
8. Certification of proficiency in second foreign language
9. Comprehensive examination
10. Final examination
11. Dissertation copies filed
12. Granting of the degree

Professional Teaching Certificate

The Department of Public Instruction 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 credit 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 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
- G. E. Korzan, Ph.D.—marketing
- D. J. McConnell, Ph.D.—resource development
- J. A. Mollett, Ph.D.—production economics
- C. W. Peters, M.S.—marketing
- P. F. Philipp, Ph.D.—production economics

AFFILIATE FACULTY
- P. P. Wallrabenstein, Ph.D.—statistics

Candidates for the MS 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 MS 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 MS 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)
624 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)
631 Seminar: Consumer Economics and Food Distribution (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 (ar.)
800 Thesis Research (ar.)

Agricultural Engineering

GRADUATE FACULTY
D. M. Kinch, Ph.D. (Chairman)—power and machinery, farm processing
B. D. van't Woudt, Ph.D.—irrigation, soil and water relationships
Jaw-Kai Wang, Ph.D.—farm processing, power and machinery

AFFILIATE FACULTY
R. A. Duncan, M.S.—power and machinery
W. E. Hart, M.S.—power and machinery, irrigation
R. T. Tribble, M.S.—power and machinery, 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 graduate credit 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 courses from related fields is Mathematics 401. Candidates may specialize in farm processing, power and machinery, or soil and water conservation. Required courses are marked with an asterisk.

**AGRICULTURAL ENGINEERING**

- 434 Agricultural Power and Equipment (3)
- 435 Irrigation Principles and Practices (2)
- 631 Analysis of Implement Design (3)
- 635 Farm Irrigation System Design (3)
- *637 Instrumentation (3)*
- *638-639 Topics in Tropical Agricultural Engineering (2-2)*
- 699 Directed Research (ar.)
- *800 Thesis Research (ar.)*

**Agronomy**

**GRADUATE FACULTY**

- G. D. Sherman, Ph.D. (Chairman)—crop management
- E. J. Britten, Ph.D.—plant breeding
- H. F. Clements, Ph.D.—sugar cane agronomy
- R. L. Fox, Ph.D.—soil and crop management
- A. J. Mangelsdorf, Ph.D.—sugar cane agronomy
- P. P. Rotar, Ph.D.—plant breeding
- M. Takahashi, M.S.—tropical range management
- O. R. Younge, Ph.D.—soil and crop management

**AFFILIATE FACULTY**

- N. S. Hanson, Ph.D.—weed control
- W. G. Sanford, Ph.D.—agronomy
- G. H. Stanford, Ph.D.—sugar cane 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)
Intended candidates for the M.S. must present a minimum of 18 hours of undergraduate credit in animal science and related fields. The related subject matter fields are Agronomy, Biochemistry, Botany, Chemistry, Genetics, Home Economics, Horticulture, Mathematics, Microbiology, Poultry Science, and Zoology.

Courses available for graduate credit are listed below.

**Animal Science**

**GRADUATE FACULTY**

E. H. Cobb, Ph.D. (Chairman)—animal breeding and genetics

J. H. Koshi, Ph.D.—dairy science

K. K. Otagaki, Ph.D.—animal nutrition

R. W. Stanley, Ph.D.—animal nutrition

O. Wayman, Ph.D.—physiology

**AFFILIATE FACULTY**

F. T. Lynd, D.V.M.—pathology

**ANIMAL SCIENCE**

442-443 Physiology of Domestic Animals (4-4)

445 Animal Breeding (3)

446 Animal Diseases and Their Control (3)

641 Seminar in Animal Science (1)

642 Ruminant Nutrition (2)

643 Physiology of Reproduction and Milk Secretion (3)

645 Advanced Animal Breeding (2)

699 Directed Research (ar.)

800 Thesis Research (ar.)

**Anthropology**

**GRADUATE FACULTY**

L. E. Mason, Ph.D. (Chairman)—applied anthropology and Micronesian ethnology

F. M. Cammack, Ph.D.—Malayo-Polynesian languages and linguistics

S. H. Elbert, Ph.D.—Malayo-Polynesian languages and linguistics

K. P. Emory, Ph.D.—Polynesian archeology and ethnology
Intended candidates for the M.A. or Ph.D. must present a minimum undergraduate background of 18 credits in anthropology, or be prepared to make up such work during the first year of graduate work. Students with the B.A. in related fields are particularly welcome as graduate students in anthropology. A broad base in related courses in the social sciences, humanities, and natural sciences is strongly recommended in any case.

The M.A. candidate is expected to acquire a basic knowledge of all major fields of anthropology (biological anthropology, archaeology, linguistics, and social anthropology), a familiarity with the historical development of anthropology as a formal discipline, and an understanding of the convergent approaches used by anthropologists, sociologists, and social psychologists in the study of human behavior. Required courses are Anthropology 700, 701, two semesters of 750. A reading knowledge of one foreign language useful in the candidate’s research is required.

In addition to the broad preparation in anthropology described as prerequisite for the master’s degree, the doctoral candidate must demonstrate competence in anthropological methods of theory construction, research design, and the collection and evaluation of data. Before undertaking his dissertation research he must acquit himself satisfactorily in faculty-supervised field research. Required courses are Anthropology 700, 701, 710, 711, four semesters of 750. Each candidate is expected to know basic statistical methodology, and to give evidence of his ability to prepare and present instructional material in anthropology at the undergraduate level. Upon recommendation of the supervisory committees, oral competence alone may be accepted for one of the two required languages. The doctoral dissertation must be based upon fieldwork in another culture; such fieldwork may take up to one year and should not be less than six 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 committees.

ANTHROPOLOGY

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>Hawaii (3)</td>
<td></td>
</tr>
<tr>
<td>415</td>
<td>Southeast Asia (3)</td>
<td></td>
</tr>
</tbody>
</table>
417 India (3)
419 Islamic Culture (3)
501 The American in Foreign Cultures (3)
504 Applied Anthropology (3)
515 Anthropology and Education (3) (same as Ed HP 570)
600 Polynesia (3)
601 Micronesia (3)
604 Indonesia (3)
610 Asian Archaeology (3)
620 Introduction to Linguistic Analysis (3)
621 Phonemics (3)
622 Linguistic Morphology (3)
641 Typology of Asian Languages (3)
699 Directed Research (ar.)
700 History of Anthropology (3)
701 Culture, Society, and Personality (3)
710 Methods I (3)
711 Methods II (6)
750 Seminar (3)
   (1) Linguistics
   (2) Archaeology
   (3) Social Anthropology
   (4) Culture and Personality
   (5) Biological Anthropology
800 Thesis Research (ar.)

Art

GRADUATE FACULTY
G. F. Carpenter, B.A. (Chairman)—painting, Western art
C. W. Anderson, M.A.—painting, design
J. Charlot, D.F.A.—mural painting, Western art
J. H. Cox, M.A.—painting, Oceanic art
G. E. Ecke, Ph.D.—Far Eastern art
M. T. Everson, M.F.A.—weaving, textile design
C. F. Horan, M.A.—ceramics
K. G. Kingrey, M.A.—design
P. Neogy, M.A.—Far Eastern art
B. Norris, B.A.—painting
H. A. Robinson, M.A.—textiles
E. Stasack, M.F.A.—painting, print making
M. Turnbull, M.A.—painting

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, 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 B at the time of the preliminary conference.

The M.F.A. is awarded for creative studio work in one or more of the following media: drawing and graphics, painting, weaving, ceramics, visual design (including advertising art). 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.

A deficient or incompatible undergraduate program will require, at the discretion of the Graduate Faculty, additional course work for either degree.

Courses available for graduate credit 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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>412</td>
<td>Figure Drawing (2)</td>
</tr>
<tr>
<td>415</td>
<td>Printmaking (2)</td>
</tr>
<tr>
<td>416</td>
<td>Illustration (2)</td>
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<tr>
<td>421-422</td>
<td>Advanced Painting (2–2)</td>
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<tr>
<td>424</td>
<td>Water Color Painting B (2)</td>
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<tr>
<td>425</td>
<td>Materials and Techniques of Painting (2)</td>
</tr>
<tr>
<td>436</td>
<td>Advanced Weaving (2)</td>
</tr>
<tr>
<td>442</td>
<td>Advanced Ceramics (2)</td>
</tr>
<tr>
<td>443</td>
<td>Ceramic Glaze Calculations (2)</td>
</tr>
<tr>
<td>463-464</td>
<td>Advanced Visual Design (2–2)</td>
</tr>
<tr>
<td>476</td>
<td>Italian Renaissance Painting and Sculpture (3)</td>
</tr>
<tr>
<td>477</td>
<td>Northern Renaissance Painting and Sculpture (3)</td>
</tr>
<tr>
<td>478</td>
<td>19th Century Painting and Sculpture (3)</td>
</tr>
<tr>
<td>479</td>
<td>20th Century Painting and Sculpture (3)</td>
</tr>
<tr>
<td>565</td>
<td>Visual Communication (2)</td>
</tr>
<tr>
<td>585</td>
<td>Chinese Painting (3)</td>
</tr>
<tr>
<td>621</td>
<td>Painting (2)</td>
</tr>
<tr>
<td>636</td>
<td>Design and Research in Weaving (2)</td>
</tr>
<tr>
<td>642</td>
<td>Ceramic Design and Research (2)</td>
</tr>
<tr>
<td>661</td>
<td>Visual Design (2)</td>
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<tr>
<td>683</td>
<td>Applied Arts of China (3)</td>
</tr>
<tr>
<td>689</td>
<td>Seminar in Oriental Art (2)</td>
</tr>
<tr>
<td>690</td>
<td>General Seminar (2)</td>
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<tr>
<td>699</td>
<td>Directed Work (ar.)</td>
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<tr>
<td>782</td>
<td>Buddhist and Hindu Art of India (3)</td>
</tr>
<tr>
<td>784</td>
<td>Early Chinese Art (3)</td>
</tr>
<tr>
<td>786</td>
<td>Japanese Painting and Sculpture (3)</td>
</tr>
</tbody>
</table>
Asian Studies

GRADUATE FACULTY
R. S. Anderson, Ph.D. (Chairman)—education
G. Akita, Ph.D.—History
W. P. Lebra, Ph.D.—Asian studies

Asian Studies is an area program leading to an M.A. degree. Students may concentrate their studies on language or area or a combination of both relating to a particular country or to a major geographic division of Asia. Specialization is also possible in topical problems which cut across national boundaries. Students electing to concentrate on area or topical problems will also be required to have considerable facility in one major language of the region under study. In all cases, candidates will be expected to gain a broad basic knowledge of Asia.

Intended candidates for the M.A. in Asian Studies must present a minimum of 15 semester hours credit in Asian Studies at the undergraduate level, or comparable experience in the field sufficient to engage profitably in graduate work at an interdisciplinary level. In addition, candidates should have had basic training in an Asian language equivalent to two years of standard course work. Persons lacking such background may be required to take, without credit toward the degree, a full year of intensive language training, and such area courses as are deemed necessary to make up the deficiencies.

Requirements for the M.A. in Asian Studies include: (1) a minimum of 12 semester credits concentrated in a major field; (2) 6 semester credits in each of two cognate fields; (3) 6 credits of thesis research. Each student must take an integrated area course, such as Asian Studies 701-702. This course can be counted toward one of the cognate requirements.

The major field may be East Asia (Japan, China, Korea), Southeast Asia (Indonesia, Thailand, Philippines, Malaya), or South Asia (India, Pakistan). Courses other than the general requirements will be determined by the supervising committees in consultation with the student.

There are over 150 language and area courses dealing with Asia which are open to graduate students in Asian Studies, 42 of them dealing with Southeast Asia, 57 on South Asia, and 60 on East Asia. For complete listing see bulletin of the Asian Studies Program. Either 701-702 or 703-704 are required.

ASIAN STUDIES

501-502 Civilizations of the East (3-3)
699 Directed Research (ar.)
701-702 Civilizations of the East: China, Japan, Korea (3-3)
703-704 Civilizations of the East: South and Southeast Asia (3-3)
798-799 Seminar in East Asian Studies (3-3)
800 Thesis Research (ar.)
Biochemistry and Biophysics

GRADUATE FACULTY

T. Winnick, Ph.D. (Chairman)—metabolism and biosynthesis of proteins and peptides
J. B. Hall, Ph.D.—nucleic acids of viruses
J. W. Hylin, Ph.D.—plant biochemistry, nitrogen and sulfur compounds
H. Matsumoto, Ph.D.—metabolism of toxic plant products
H. F. Mower, Ph.D.—biological nitrogen fixation
K. T. Yasunobu, Ph.D.—relationship of enzyme structure to function

AFFILIATE FACULTY

G. G. Dull, Ph.D.—plant biochemistry, natural products
W. A. Gortner, Ph.D.—biochemistry of plants and foods, radiochemistry
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, Genetics, Plant Physiology, Zoology, Chemistry, and Mathematics. Courses available for graduate credit are listed below.

BIOCHEMISTRY

601-602 General Biochemistry (3–3)
611-612 Biochemistry Laboratory (2–2)
621 Chemistry of the Proteins (2)
622 Metabolism and Biosynthesis of Proteins (2)
651 Advanced Enzymology (2)
660 Survey of Intermediary Metabolism (2)
691-692 Specialized Instrumentation and Methodology (2–2)
699 Directed Research (ar.)
711 Nucleic Acids and Viruses (2)
720 Molecular Genetics and Comparative Biochemistry (2)
791-792 Seminar (1–1)
800 Thesis Research (ar.)

BIOPHYSICS

750 Special Topics in Biophysics (2)

Botany

GRADUATE FACULTY

C. H. Lamoureux, Ph.D. (Chairman)—anatomy
M. S. Doty, Ph.D.—phycology
B. J. Cooil, Ph.D.—plant physiology
G. E. Baker, Ph.D.—mycology
G. W. Gillett, Ph.D.—taxonomy

33
Intended candidates must present a minimum of 18 hours of undergraduate credit in botany. Within the undergraduate and graduate program, the student should demonstrate adequate preparation in the physiology, morphology, and taxonomy of cryptogams or vascular plants. Fields of specialization include the systematics, morphology, ecology, physiology, and genetics of cryptogams and vascular plants. Courses available for graduate credit are listed below. Courses required of all graduate students are marked with an asterisk. Related courses in other departments are also acceptable for graduate credit.

**BOTANY**

- 412 Plant Microtechnique (3)
- 418 Cytology (3)
- 426 Vascular Plants (3)
- 430 Mycology (3)
- 436 Medical Mycology (2)
- 461 Taxonomy and Exploration (3)
- 562 Advanced Taxonomy (1)
- 570-571 Advanced Physiology (3-3)
- 572 Techniques in Physiology (2)
- 573 Techniques in Physiology-Biochemistry (2)
- 586 Biological Productivity of the Sea (3)
- 610 Botanical Seminar (1)
- 612 Advanced Botanical Problems (ar.)
- 615 Morphology Seminar (2)
- 665 Nomenclature Seminar (2)
- 675 Physiology Seminar (2)
- 681-684 Phycology (3-3-3-3)
- 699 Directed Research (ar.)
- 799 Directed Research (ar.)
- *800 Thesis Research (ar.)

**Business Administration**

**GRADUATE FACULTY**

- E. C. Pendleton, Ph.D. (Chairman)—labor economics, industrial relations
- J. Adler, Ph.D.—accounting, finance
- D. W. Bell, B.S.—real estate, land economics
D. S. Carlson, M.B.A.—management, business finance
C. F. Congdon, M.B.A.—statistics, marketing
D. A. Corbin, Ph.D.—accounting, finance
J. B. Ferguson, Ph.D.—personnel management, industrial relations
H. W. Grayson, Ph.D.—economic theory
A. L. Kirkpatrick, M.A.—economic theory, money and banking
K. Lau, LL.M.—business law, finance
Y. S. Leong, Ph.D.—public finance, statistics
K. W. Pierson, M.A.—insurance
P. M. Pratt, Ph.D.—marketing
H. S. Roberts, Ph.D.—labor economics, industrial relations
K. Sasaki, Ph.D.—statistics
K. K. Seo, Ph.D.—economic theory, money and banking
D. M. Slate, Ph.D.—economic theory, industrial relations
H. B. Stellmacher, M.B.A.—marketing
R. Taussig, Ph.D.—accounting, finance
L. G. Winter, Ph.D.—foreign trade, marketing, tourism

Intended candidates for the M.B.A. must have had a minimum of 24 semester hours of undergraduate credit in business administration including elementary accounting, business statistics, elementary principles of economics, and money and banking.

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

The 30 credit hours in the graduate major may be selected, in consultation with the student’s interim advisor or thesis committee, from courses numbered 400 or above in the catalogue of the College of Business Administration. The graduate program of study requires at least 18 credit hours in courses numbered 600 or above, including Management 600, Marketing 600, at least one other graduate seminar related to the major field, and BAS 800.

Six semester hours of courses numbered 400 or above in the Department of Economics may be included in the program for the degree in Business Administration.

Graduate courses offered by departments in the College of Business Administration:

**ACCOUNTING**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tr>
<td>600</td>
<td>Seminar in Management Accounting</td>
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<tr>
<td>605</td>
<td>Seminar in Accounting Theory</td>
<td>(3)</td>
</tr>
<tr>
<td>610</td>
<td>Seminar in Contemporary Theory</td>
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<td>699</td>
<td>Directed Research (ar.)</td>
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**BUSINESS ECONOMICS**

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<td>Directed Research (ar.)</td>
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**BUSINESS ANALYSIS AND STATISTICS**

<table>
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<th>Course</th>
<th>Title</th>
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<tr>
<td>600</td>
<td>Seminar in Business Analysis and Statistics</td>
<td>(3)</td>
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</tbody>
</table>
Directed Research (ar.)

FINANCE
600 Seminar in Finance (3)
699 Directed Research (ar.)

INSURANCE
600 Seminar in Insurance (3)
699 Directed Research (ar.)

MANAGEMENT
600 Seminar in Management (3)
610 Seminar in Problems of Business (3)
640 Applied Problems of Business and Government (3)
699 Directed Research (ar.)

MARKETING
600 Managerial Problems of Marketing (3)
610 Seminar in Marketing (3)
699 Directed Research (ar.)

PERSONNEL AND INDUSTRIAL RELATIONS
690 Seminar in Current Labor Problems (3)
699 Directed Research (ar.)

REAL ESTATE
600 Seminar in Real Estate (3)
699 Directed Research (ar.)

Chemistry

GRADUATE FACULTY
R. G. Inskeep, Ph.D. (Chairman)—infrared spectroscopy, hydrogen bonding, complexions
M. M. Frodyma, Ph.D.—analytical chemistry, polarography, gas analysis
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
W. A. Last, Ph.D.—physical techniques in inorganic, low-level radiation measurements
J. J. Naughton, Ph.D.—analytical, physical, solid state and geochemistry
P. J. Scheuer, Ph.D.—organic chemistry, structure determination of natural products
J. D. Vaughan, Ph.D.—aromatic heterocycles, nuclear and radiochemistry
J. L. T. Waugh, Ph.D.—boron chemistry, intermetallic and heteropoly compounds, X-ray studies
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

421 Intermediate Inorganic Chemistry (3)
424 Preparative Inorganic Chemistry (3)
441 Preparative Organic Chemistry (3)
444 Qualitative Organic Analysis (4)
445 Intermediate Organic Chemistry (3)
580 Oceanographic Chemistry (3)
582 Chemical Literature (2)
621 Atomic Structure (3)
622 Ionic Compounds and Complexes (3)
623 Atomic and Molecular Compounds and Complexes (3)
624 Metals and Intermetallic Compounds (3)
631-632 Instrumental Methods of Analysis (3-3)
633 Advanced Chemical Analysis (4)
642 Organic Chemistry Theory (3)
646 Quantitative Organic Analysis (3)
651-652 Intermediate Physical Chemistry (3-3)
655 Radiochemistry and Nuclear Reactions (3)
656 Radiochemical Techniques (3)
*691-692 Seminar (1-1)
699 Directed Research (ar.)
731-732 Special Topics in Analytical Chemistry (3-3)
741 Natural Products Chemistry (3)
742 Chemistry of Cyclic Compounds (3)
743 Stereochemistry (3)
751 Molecular Structure (3)
752 Surface and Polymer Chemistry (3)
753-754 Quantum Chemistry (3-3)
Civil Engineering

GRADUATE FACULTY

A. Chiu, Ph.D.—(Chairman)—structures
J. Antebi, Sc.D.—structures
J. R. Evans, M.S.—soil mechanics
M. L. P. Go, Ph.D.—structures
R. Haselwood, M.S.—transportation and soil mechanics
S. L. Lau, Ph.D.—hydraulics
H. C. Martin, Ph.D.—structural mechanics
T. Mitsuda, M.S.—applied mechanics
B. Perry, Ph.D.—fluid mechanics

Intended candidates for the M.S. in Civil Engineering must present a B.S. in Civil Engineering or the equivalent. Both plans A and 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.

Courses required in both programs are marked with an asterisk.

CIVIL ENGINEERING

621 Advanced Fluid Mechanics I (3)
622 Advanced Fluid Mechanics II (3)
623 Ground Water Hydrology (3)
624 Flow in Porous Media (3)
651 Advanced Soil Mechanics I (3)
652 Advanced Soil Mechanics II (3)
671 Theory of Elasticity (3)
672 Plates and Shells (3)
673 Structural Dynamics (3)
674 Theory of Elastic Stability (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)
*687 Civil Engineering Seminar (1)
Drama and Theatre

Graduate Faculty
E. Ernst, Ph.D. (Chairman)—oriental theatre, aesthetics, modern theories
L. Bentley, M.A.—acting, creative dramatics, puppetry
J. Dreier, Ph.D.—production, theatre practice, design
E. Langhans, Ph.D.—History, directing, playwriting
J. Trapido, Ph.D.—introduction to theatre, stagecraft, lighting

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. A reading knowledge of a foreign language is required. Deficiencies in undergraduate preparation must be made up without credit.

Two degrees are offered: the Master of Arts and the Master of Fine Arts. 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.

Courses available for graduate credit 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 6 credits from Drama and Theatre 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 Scholarship holders 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)
430 Direction (3)
435 Design in the Theatre (3)
440 Modern Stagecraft and Stage Lighting (3)
540 Oriental Drama and Theatre (3)
550 History of the Theatre (3)
Economics

GRADUATE FACULTY

R. M. Kamins, Ph.D. (Chairman)—Soviet economics, public finance, fiscal policy
Paul Ellsworth, Ph.D.—(Visiting Professor)—international economics, international trade
F. C. Hung, Ph.D.—theory, Asian economic development
T. H. Ige, Ph.D.—labor economics (on leave 1963-64)
S. M. Mark, Ph.D.—theory, mathematical economics, development (on leave 1963-64)
R. H. Myers, Ph.D.—economic history
H. T. Oshima, Ph.D.—national income accounting, development
R. Sato, Ph.D.—mathematical economics

Intended candidates for the M.A. in Economics must present a minimum of 24 hours of undergraduate credit in economics including principles, money and banking, intermediate economic theory, and a course in statistics.

Courses for the graduate major must be chosen from those listed below except that courses in other related fields up to a maximum of 9 credits may be elected. All candidates will be expected to take the majority of their 24 hours course work in 600 level courses. Economics 600 and 602 are required for all candidates. Candidates shall demonstrate competency in three fields of specialization by passing a comprehensive written and oral examination to be administered by the Graduate Faculty of the Economics Department. One of these fields must be economic theory, another may be a special field in economics or in some other department as approved by the candidate's committee.

The fields of specialization presently offered by the Department are: economic theory, economic development, quantitative analysis, monetary economics, public finance, and international economics.

ECONOMICS

410 Current Economic Problems of Asia and the Far East (3)
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<td>Economic Development of East Asia (3)</td>
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<td>412</td>
<td>Economic Development of South and Southeast Asia (3)</td>
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<td>413</td>
<td>Economic Development of the Soviet Union (3)</td>
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<td>414</td>
<td>Financial Structure of the Soviet Union (3)</td>
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<td>416</td>
<td>Economic Development of Europe (3)</td>
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<td>419</td>
<td>Economic Development of Hawaii (3)</td>
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<tr>
<td>420-421</td>
<td>Quantitative Methods in Economic Analysis (3-3)</td>
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<td>430</td>
<td>Comparative Economic Systems (3)</td>
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<td>450</td>
<td>Public Finance (3)</td>
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<td>460</td>
<td>International Trade and Finance (3)</td>
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<td>470</td>
<td>Government and Business (3)</td>
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<tr>
<td>502</td>
<td>American Economic Policy (3)</td>
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<tr>
<td>600</td>
<td>Theory of Price and Distribution (3)</td>
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<td>Theory of Income and Growth (3)</td>
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<td>History of Economic Thought (3)</td>
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<td>606</td>
<td>Theory of Economic Development (3)</td>
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<td>619</td>
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<td>620</td>
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<td>Econometrics (3)</td>
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<td>National Economic Accounting (3)</td>
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<td>Economic Programming Techniques (3)</td>
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<td>Seminar in Money and Banking (3)</td>
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<td>699</td>
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<td>800</td>
<td>Thesis Research (ar.)</td>
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</tbody>
</table>

**Education**

**GRADUATE FACULTY**

G. A. Meyer, Ph.D. (Chairman)—secondary education and curriculum
R. S. Alm, Ph.D.—language arts and reading
R. S. Anderson, Ph.D.—comparative education
O. J. Beyers, Ed.D.—tests and measurement
W. H. Boyer, Ed.D.—philosophy
A. B. Carr, Ed.D.—science education—elementary schools
F. E. Clark, Ed.D.—guidance and counselling
R. W. Clopton, Ph.D.—history and philosophy
D. R. Collins, Ed.D.—guidance and counselling
J. B. Crossley, Ed.D.—administration and supervision
H. V. Everly, Ph.D.—administration and supervision
C. H. Ewing, Ph.D.—industrial
M. Ezer, Ed.D.—elementary
E. D. Hayes, Ph.D.—elementary
A. W. S. In, Ph.D.—secondary
L. D. Jackson, Ed.D.—comparative, administration
R. W. Johnson, Ed.D.—administration and supervision
W. D. Lampard, Ed.D.—home and school relationships
R. M. Martin, Ph.D.—secondary, administration and curriculum
T. A. McIntosh, Ed.D.—special education, guidance
P. P. Mickelson, Ph.D.—administration and higher education
T. Nelson, Ed.D.—administration
D. S. Noda, Ph.D.—administration
A. L. Pickens, Ed.D.—art education
M. R. Porter, Ph.D.—elementary
M. F. Poyzer, Ed.D.—industrial
G. Sax, Ph.D.—educational psychology
W. A. Wittich, Ph.D.—audio-visual

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 and (2) his performance on the general examination.

Both plan A (thesis) and plan B (nonthesis) are available.

Plan A: The program may include a maximum of 10 semester credits in approved courses other than Education, which are related to the candidate's announced goals. At least one graduate seminar is required.

Plan B: The program normally includes 21 semester hours of Education and 15 semester hours (a minimum of 9) in a planned and approved sequence of courses which carry graduate credit in Fields of Study other than Education. It is designed to enable teachers to strengthen undergraduate majors (teaching fields) in such areas as art, business education, agricultural arts, English, social studies (anthropology, economics, geography, government, history, sociology), industrial arts, languages, mathematics, science, library science, music, home economics, and speech. Related Fields of Study include Drama, Philosophy, Psychology, and Asian Studies.

Courses required in both programs are marked with an asterisk.

EDUCATIONAL PSYCHOLOGY

507 Remedial Reading (2)
510 Education of Exceptional Children (3)
511 Teaching Techniques, Retarded Children (3)
514 Audio-Visual Media (3)
601 Guidance in the School (3)
602 Elementary School Guidance (2)
603 Sociometry for Classroom Teachers (2)
604 Occupational Information in Guidance (2)
605 Problems of School Adjustment (2)
607 Clinical Procedures in Reading (3)
609 Tests and Inventories in Guidance (2)
613 Education of Slow Learners (2)
614  Education of Rapid Learners (2)
615  Curriculum Development for Mentally Retarded Children (3)
616  Seminar in Education of Mentally Retarded (2)
619  Education of Adult Learners (2)
634  Television in Education (3)
672  Advanced Educational Psychology (3)
699  Directed Research (ar.)
701  Seminar in Guidance (2)
702  Group Guidance (2)
703  Guidance Practicum (3)
704  Seminar in Audio-Visual Education (3)
705  Production of Audio-Visual Materials (3)
*708  Educational Research Methods (3)
709  Educational Evaluation (3)
714  Organization of New Media Programs (3)

HISTORY AND PHILOSOPHY OF EDUCATION
570  Anthropology and Education (3)
*650  History of Education (3)
*660  Philosophy of Education (3)
661  The Church and the School (2)
663  Social Foundations of Education (3)
664  Interpersonal Relationships in Education (3)
    (not offered 1962-63)
665  Education in America (3)
670  Comparative Education: Europe and America (3)
671  Comparative Education: The Orient (3)
699  Directed Research (ar.)
751  History of American Education (3)
754  Seminar in the History of Education (2)
757  Educational Classics (2)
    (not offered 1962-63)
761  Japanese Philosophy of Education (2)
    (not offered 1962-63)
762  Educational Philosophy of John Dewey (2)
763  Seminar in Philosophy of Education (2)
764  Contemporary Educational Philosophers (2)
    (not offered 1962-63)
*768  Seminar in Problems in Education (2)
770  Seminar in Comparative Education (2)
    (not offered 1962-63)

ELEMENTARY EDUCATION
620  Teaching Reading in the Elementary School (2)
621  Modern Language Arts Program, Elementary (2)
622 Elementary School Curriculum (2)
626 Art in Elementary Education (2)
699 Directed Research (ar.)
722 Seminar in Curriculum, Elementary (3)

SECONDARY EDUCATION

631 Modern Language Arts Program, Secondary (2)
634 Extraclass Activities in Secondary Schools (2)
635 Intermediate School Curriculum (2)
   (not offered 1962-63)
636 Secondary School Curriculum (2)
637 Art in Secondary Education (3)
672 Teaching Aids on Asia (2)
699 Directed Research (ar.)
733 Seminar in Curriculum, Secondary (3)
737 Foundations in Art Education (3)

INDUSTRIAL EDUCATION

401 Problems in Industrial Education (ar.)
402 Improvement of Instruction (ar.)
764 Seminar in Industrial Education (2)

ADMINISTRATION AND SUPERVISION

670 Supervision of Instruction (2)
671 School Publicity and Public Relations (2)
679 Supervision of Student Teaching (2)
680 Public School Organization (2)
682 Administration of the Elementary School (2)
683 Administration of the Secondary School (2)
686 Organization and Administration of Vocational and Technical Schools (2) (not offered 1962-63)
687 Organization and Administration of Adult Education (2)
688 Administration of the Intermediate School (2)
   (not offered 1962-63)
689 The School Plant (2)
699 Directed Research (ar.)
762 Higher Education in the United States (3)
770 Seminar in Supervision of Instruction (2)
780 Seminar in Educational Administration (2)
781 Legal and Business Aspects of School Administration (2)
783 Organization of Instructional Programs (2)

LIBRARY SCIENCE

610 Promoting Library Use (2)
640 Advanced Technical Processes (2)

44
Electrical Engineering

GRADUATE FACULTY

P. C. Yuen, Ph.D. (Chairman)—theory and applications of microwave components, devices, and systems
R. K. L. Chan, Ph.D.—radio propagation
E. D. Gott, D.Eng.—statistical communication theory, circuit theory, computer circuitry
K. Najita, M.S.—applied mathematics and microwave tubes

Intended candidates for the M.S. in Electrical Engineering must present the B.S. in Electrical Engineering or the equivalent. Both plans A and 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. At least two graduate seminars are required.

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)
610 Advanced Feedback Control Systems (3)
611 Information Theory (3)
621-622 Advanced Microwave Theory (3–3)
697-698 Seminar in Electrical Engineering (1–1)
699 Directed Research (ar.)
800 Thesis Research (ar.)

English

GRADUATE FACULTY

T. L. Summersgill, Ph.D. (Chairman)—Elizabethan literature, Chaucer
J. M. Backus, Ph.D.—American literature
C. S. Bouslog, Ph.D.—English romanticism, 20th century British and American
Intended candidates for the M.A. are expected to present, in addition to the customary freshman and sophomore composition and literature survey courses, 24 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.

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

ENGLISH

440 English Drama to 1642 (3)
443-444 Modern Dramatic Literature (3-3)
447 The English Novel to 1832 (3)
448 The English Novel, 1832-1900 (3)
451 Medieval English Literature (3)
452 Chaucer (3)
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)
Entomology

GRADUATE FACULTY
D. E. Hardy, Ph.D. (Chairman)—taxonomy, medical entomology
H. A. Bess, Ph.D.—biological control and ecology
D. H. Habeck, Ph.D.—immature insects, insect biology
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
K. Ito, M.S.—pineapple insects
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
C. T. Schmidt, Ph.D.—pineapple insects
L. F. Steiner, M.S.—fruit flies
N. Wilson, Ph.D.—acarology
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), one year of physics, 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**

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<thead>
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<th>Course</th>
<th>Title</th>
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<td>Medical and Veterinary Entomology</td>
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<td>662</td>
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<td>Scale Insects</td>
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<td>673</td>
<td>Insect Pathology</td>
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<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>
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<tr>
<td>686</td>
<td>Insect Transmitted Diseases of Plants</td>
<td>(3)</td>
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<tr>
<td>697</td>
<td>Entomology Seminar</td>
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<td>699</td>
<td>Directed Research (ar.)</td>
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<tr>
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**ZOOLOGY**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<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 and technology  
H. Y. Yamamoto, Ph.D.—food science and technology

**AFFILIATE FACULTY**

F. P. Boyle, Ph.D.—food technology  
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 Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>601-602</td>
<td>Principles in Food Science and Technology</td>
<td>3-3</td>
</tr>
<tr>
<td>610</td>
<td>Tropical Food Processing</td>
<td>3</td>
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<tr>
<td>611</td>
<td>Tropical Food Products</td>
<td>2</td>
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<tr>
<td>*620</td>
<td>Seminar</td>
<td>1-1</td>
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<tr>
<td>699</td>
<td>Directed Research</td>
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<tr>
<td>*701</td>
<td>Recent Advances in Food Research</td>
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<tr>
<td>*800</td>
<td>Thesis Research</td>
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</tbody>
</table>

**French**

**GRADUATE FACULTY**

D. B. Aspinwall, Ph.D. (Chairman)—literature of 19th and 20th centuries  
L. Chirol, M.A.—stylistics  
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**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>*411-412</td>
<td>Literature of the Golden Age</td>
<td>3-3</td>
</tr>
<tr>
<td>*413-414</td>
<td>Eighteenth Century Literature</td>
<td>2-2</td>
</tr>
<tr>
<td>*415-416</td>
<td>Nineteenth Century Literature</td>
<td>2-2</td>
</tr>
<tr>
<td>*417-418</td>
<td>Twentieth Century Literature</td>
<td>3-3</td>
</tr>
<tr>
<td>*601</td>
<td>Seminar in Modern French Literature</td>
<td>2</td>
</tr>
<tr>
<td>*609</td>
<td>Literature of Renaissance</td>
<td>3</td>
</tr>
<tr>
<td>*660</td>
<td>Advanced Composition and Stylistics</td>
<td>2</td>
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</table>
The M.S. and Ph.D. in Genetics are offered only in human genetics. However, advanced degree programs which include genetics are available in other Fields of Study. Intended candidates must present an undergraduate background which includes introductory courses in zoology, anthropology, physics, general genetics, and human genetics. In addition, calculus, as well as analytical and organic chemistry are required.

Courses available for graduate credit are listed below. All are required of candidates. Required courses in other Fields of Study are listed also. Additional courses may be included from the fields of Animal Science, Anthropology, Botany, Biochemistry, Chemistry, Horticulture, Mathematics, Microbiology, and Zoology.

**GENETICS**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<td>Cellular Genetics</td>
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<td>618</td>
<td>Cytogenetics</td>
<td>(3)</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>
<td>(3)</td>
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<tr>
<td>654</td>
<td>Seminar</td>
<td>(1)</td>
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<td>699</td>
<td>Directed Research</td>
<td>(ar.)</td>
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<td>Thesis Research</td>
<td>(ar.)</td>
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**ZOLOGY**

<table>
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<tbody>
<tr>
<td>431</td>
<td>Biometry</td>
<td>(3)</td>
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**BIOCHEMISTRY**

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<tbody>
<tr>
<td>601-602</td>
<td>General Biochemistry</td>
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</table>

**Geography**

**GRADUATE FACULTY**

N. M. Bowers, Ph.D. (Chairman)—South and Southeast Asia, Asia, Pacific
Undergraduate preparation should include an adequate background in geography supplemented by courses in the social and physical sciences. A reading knowledge of a foreign language is strongly recommended.

Courses for the graduate program are to be selected from those listed below and from related fields. Required courses are marked with an asterisk.

**GEOGRAPHY**

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<td>420</td>
<td>Weather and Climate (3)</td>
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<tr>
<td>430</td>
<td>Cartography (3)</td>
<td></td>
</tr>
<tr>
<td>450</td>
<td>Urban Geography (3)</td>
<td></td>
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<tr>
<td>501</td>
<td>Geography of North America (3)</td>
<td></td>
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<tr>
<td>507</td>
<td>Conservation and Utilization of Natural Resources (3)</td>
<td></td>
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<tr>
<td>521</td>
<td>Geography of Europe (3)</td>
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<tr>
<td>526</td>
<td>Geography of the Soviet Union (3)</td>
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<tr>
<td>541</td>
<td>Geography of Asia (3)</td>
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<tr>
<td>552</td>
<td>Geography of Japan (3)</td>
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<tr>
<td>553</td>
<td>Geography of China (3)</td>
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<tr>
<td>554</td>
<td>Geography of India and Southeast Asia (3)</td>
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<tr>
<td>561</td>
<td>Geography of Australia and New Zealand (2)</td>
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<tr>
<td>571</td>
<td>Geography of the Pacific Islands (3)</td>
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<tr>
<td>578</td>
<td>Geography of Hawaii (3)</td>
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<tr>
<td>580</td>
<td>Geography of the Tropics (3)</td>
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<tr>
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<td>History of Geography (3)</td>
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<td>Historical Geography (3)</td>
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<td>Studies in Economic Geography (3)</td>
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<td>645</td>
<td>Field Methods (3)</td>
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<td>Seminar in Geography of Japan (3)</td>
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<tr>
<td>665</td>
<td>Seminar in Geography of the Pacific (3)</td>
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<tr>
<td>*680</td>
<td>Seminar in Geography (3)</td>
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<tr>
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<td>Thesis Research (ar.)</td>
<td></td>
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</tbody>
</table>

**Geological Sciences**

**GRADUATE FACULTY**

A. T. Abbott, Ph.D. (Chairman)—ore deposits, geomorphology
T. K. Chamberlain, Ph.D.—marine geology, sedimentology
D. C. Cox, M.A.—hydrology, ground-water geology
Intended candidates for the M.S. and Ph.D. in Geology must present a minimum undergraduate background of 20 credit hours in geology and solid-earth geophysics, including courses in physical and historical geology, mineralogy, petrology, and structural geology. One year each of college mathematics, chemistry, and physics also are required.

Courses available for graduate credit are listed below. Related courses in Chemistry, Physics, Mathematics, Oceanography, Soil Science, and Zoology are recommended, and may be used as credit toward the degree with approval of the supervising committees.

**GEOLOGY**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>410</td>
<td>Mineralogy</td>
<td>3</td>
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<tr>
<td>415</td>
<td>Petrology</td>
<td>4</td>
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<tr>
<td>420</td>
<td>Optical Mineralogy</td>
<td>3</td>
</tr>
<tr>
<td>430</td>
<td>Introduction to Geophysics</td>
<td>3</td>
</tr>
<tr>
<td>431</td>
<td>Elementary Seismology</td>
<td>3</td>
</tr>
<tr>
<td>440</td>
<td>Geology of Fuels</td>
<td>2</td>
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<tr>
<td>445</td>
<td>Paleontology</td>
<td>3</td>
</tr>
<tr>
<td>454</td>
<td>Economic Geology</td>
<td>2</td>
</tr>
<tr>
<td>455</td>
<td>Geology of Ground-water</td>
<td>3</td>
</tr>
<tr>
<td>456</td>
<td>Engineering Geology</td>
<td>2</td>
</tr>
<tr>
<td>457</td>
<td>Mineral Resources</td>
<td>2</td>
</tr>
<tr>
<td>460</td>
<td>Geomorphology</td>
<td>3</td>
</tr>
<tr>
<td>470</td>
<td>Marine Geology</td>
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<tr>
<td>480</td>
<td>Petrography</td>
<td>3</td>
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<td>490</td>
<td>Regional</td>
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<td>495</td>
<td>Geochemistry</td>
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<td>500</td>
<td>Advanced General Geology</td>
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<td>602</td>
<td>Seminar in Igneous Petrology</td>
<td>2</td>
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<tr>
<td>603</td>
<td>Seminar in Metamorphic Geology</td>
<td>2</td>
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<tr>
<td>605</td>
<td>Seminar in Hydrogeology</td>
<td>3</td>
</tr>
<tr>
<td>606</td>
<td>Seminar in Engineering Geology</td>
<td>3</td>
</tr>
<tr>
<td>610</td>
<td>Elements of Solid-earth Geophysics</td>
<td>3</td>
</tr>
<tr>
<td>615</td>
<td>Seismology</td>
<td>3</td>
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<td>620</td>
<td>Seminar in Gravity of the Earth</td>
<td>3</td>
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<tr>
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<td>Seminar in Geomagnetism</td>
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<td>640</td>
<td>Sedimentology</td>
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<td>641</td>
<td>Seminar in Ore Deposits</td>
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<td>651</td>
<td>Seminar in Geomorphology</td>
<td>2</td>
</tr>
<tr>
<td>671</td>
<td>Near-shore Marine Processes</td>
<td>2</td>
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<tr>
<td>672</td>
<td>Geology of Deep Ocean Basins</td>
<td>2</td>
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</tbody>
</table>
690 Seminar in Geochemistry (3)
699 Directed Research (ar.)
800 Thesis Research (ar.)

**German**

**GRADUATE FACULTY**
Bertha Mueller, Ph.D. (Chairman)—Goethe, nineteenth-century literature
Clara Jenson, M.A.—classical period, German drama
John Michalski, M.A.—medieval period, twentieth-century literature
Anneliese Moore, M.A.—Franco-German literary relations

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 & 19th centuries; (b) Faust; (c) Lyric Poetry; (d) Novel, 20th century.

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

**EUROPEAN LANGUAGES**
*630 Seminar in Research Methods (2)

**History**

**GRADUATE FACULTY**
J. A. White, Ph.D. (Chairman)—Russia, Russia in Asia
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
C. H. Hunter, Ph.D.—Hawaii; United States cultural
D. D. Johnson, Ph.D.—United States diplomatic, Latin America, United States in the Pacific
D. W. Y. Kwok, Ph.D.—modern China, Chinese thought
A. J. Marder, Ph.D.—modern Europe, British naval
H. F. Margulies, Ph.D.—United States political, the progressive era
J. M. McCutcheon, Ph.D.—United States cultural and social
T. D. Murphy, Ph.D.—British Commonwealth, the Pacific
G. R. Nunn, Ph.D.—Asia, research methods and resources
S. Sakamaki, Ph.D.—Japan, Ryukyus
M. Shinoda, Ph.D.—Far East, pre-modern Japan
J. N. Stalker, Ph.D.—recent United States social and economic, United States—Far East relations
W. F. Vella, Ph.D.—Southeast Asia, Thailand

Intended candidates for the M.A. or Ph.D. must present a minimum undergraduate preparation of 18 upper-division credits in history. Deficiencies in this regard or in preparation in the area of thesis specialization may be made up before or during graduate study. Ph.D. candidates are accepted only in the Asia and Pacific areas.

Courses in history are divided into three major geographic area classifications; Americas, Asia and Pacific, and Europe. Study in at least two of these areas is required in all graduate programs, and comprehensive examinations are based upon sub-fields within the area.

Students are encouraged to take advanced courses in other disciplines related to their program of study. For the M.A. a maximum of 6 credits in such disciplines will be allowed. For the Ph.D. a minimum of 12 credits in a minor discipline is required.

Reading knowledge of one foreign language is required of M.A. candidates.

Courses available for graduate credit are listed below.
### Asia and Pacific

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>439</td>
<td>Australia and New Zealand (3)</td>
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<tr>
<td>527</td>
<td>Russian Siberia and the Pacific (3)</td>
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<tr>
<td>531-532</td>
<td>History of China (3–3)</td>
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<tr>
<td>533-534</td>
<td>Cultural History of China (3–3)</td>
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<tr>
<td>541-542</td>
<td>History of Japan (3–3)</td>
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<tr>
<td>543</td>
<td>Constitutional History of Modern Japan (3)</td>
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<tr>
<td>553</td>
<td>Russian Central Asia and the Caucasus (3)</td>
<td></td>
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<tr>
<td>571</td>
<td>Pacific Exploration and Discovery to 1779 (3)</td>
<td></td>
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<td>572</td>
<td>Pacific Islands from 1779 (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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<td>660</td>
<td>Early Civilization in the Far East (3)</td>
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<td>661</td>
<td>Seminar in Chinese History (3)</td>
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<td>663</td>
<td>Seminar in Indian History (3)</td>
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<td>664</td>
<td>Seminar in Southeast Asian History (3)</td>
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<td>Seminar in Japanese History (3)</td>
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<td>History of Thought in Japan (3)</td>
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<td>675</td>
<td>Seminar in Pacific History (3)</td>
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<td>713</td>
<td>Research Materials and Methods in Asian History (3)</td>
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### Europe

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<tr>
<td>405-406</td>
<td>Medieval Europe, 300-1300 (3–3)</td>
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<tr>
<td>409</td>
<td>Renaissance and Reformation, 1300-1600 (3)</td>
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<tr>
<td>410</td>
<td>Early Modern Europe, 1600-1800 (3)</td>
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<tr>
<td>419-420</td>
<td>European Ideas and the World Since 1800 (3–3)</td>
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<td>425</td>
<td>Europe in the Nineteenth Century (3)</td>
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<td>426</td>
<td>Europe Since Versailles (3)</td>
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<tr>
<td>431-432</td>
<td>History of England (3–3)</td>
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<tr>
<td>435</td>
<td>Constitutional History of England (3)</td>
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<tr>
<td>451-452</td>
<td>History of Russia (3–3)</td>
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<tr>
<td>611</td>
<td>Seminar in European History (3)</td>
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<td>618</td>
<td>British Empire and Commonwealth (3)</td>
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<td>671</td>
<td>Seminar in Russian History (3)</td>
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<td>Directed Research (ar.)</td>
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<tr>
<td>711</td>
<td>Seminar in Historical Method (3)</td>
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<td>712</td>
<td>Seminar in Historiography (3)</td>
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<tr>
<td>800</td>
<td>Thesis Research (ar.)</td>
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</table>

### 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
T. Murashige, Ph.D.—plant physiology
H. Y. Nakasone, Ph.D.—tropical fruit breeding
R. R. Romanowski, Ph.D.—vegetable physiology
R. M. Warner, Ph.D.—tropical fruit ecology

AFFILIATE FACULTY
R. L. Cushing, M.S.—plant genetics
J. C. Darroch, M.S.—agricultural statistics
D. P. Gowing, Ph.D.—plant physiology
N. S. Hanson, Ph.D.—weed control
G. A. Johannessen, Ph.D.—plant genetics
K. R. Kerns, M.S.—plant breeding
B. Krauss, M.S.—plant physiology
L. G. Nickell, Ph.D.—plant physiology
J. N. Warner, Ph.D.—sugar cane breeding

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 graduate credit are listed below. Related fields in which credit will normally be allowed toward the degrees in Horticulture include Agronomy, Biochemistry, Biophysics, Botany, Entomology, Genetics, Microbiology, Plant Pathology, Soil Science, and Zoology. Required courses are marked with an asterisk.

HORTICULTURE

- Principles of Plant Breeding (3)
- Principles of Floriculture (3)
- Orchidology (3)
- Post-Harvest Physiology (3)
- Systematic Vegetable Crops (3)
- Advanced Tropical Pomology (3)
- Experimental Design (2)
- Advanced Plant Breeding (3)
- Radiation Biology (3)
- Horticulture Seminar (1)
- Growth Regulators in Horticulture (3)
- Crop Ecology (3)
- Directed Research (ar.)
- Special Topics in Experimental Horticulture (ar.)
- Thesis Research (ar.)
Japanese

GRADUATE FACULTY

Y. Uyehara, M.A. (Chairman)—contemporary literature; poetry
N. Fujioka, M.A.—history of the Japanese language
H. Ikeda, Ph.D.—folk literature, Edo literature
M. K. McElrath, M.A.—linguistics, medieval literature
K. Yasuda, D.Litt.—classical literature, poetry

Intended candidates must present an undergraduate major in Japanese or an equivalent preparation in the discipline.

A minimum of 18 credit hours of course work, for which graduate credit is given, must be selected from courses in Japanese. The remainder must be selected from among courses in linguistics or others specifically related to the Japanese area. No more than 6 credits from courses numbered below 600 may be applied toward satisfaction of this requirement. In addition, a reading knowledge of some other language approved by the department is required.

Courses available for graduate credit are listed below. Required courses are marked with an asterisk. Only one of the courses marked with a dagger is required.

JAPANESE

401-402 Japanese Literature (2-2)
408 Structure of Japanese (3)
†611-612 Contemporary Japanese Literature (3-3)
613-614 Japanese Poetry (3-3)
†615-616 Classical Japanese Literature (3-3)
*693-694 Japanese Bibliography (3-3)
699 Directed Research (ar.)
*701-702 Research Seminar in Japanese (2-2)
*800 Thesis Research (ar.)

Mathematics

GRADUATE FACULTY

C. C. Gregory, Ph.D. (Chairman)—applied mathematics, differential equations, statistics, theoretical physics
R. H. Clark, M.A.—statistics
H. S. Hayashi, Ph.D.—modern algebra
E. H. Mookini, M.S.—calculus of variations, modern algebra, numerical analysis
F. M. Sioson, Ph.D.—analysis
S. B. Townes, Ph.D.—modern algebra, theory of numbers, topology
H. A. White, Ph.D.—statistics
H. Yamauchi, Ph.D.—applied mathematics

Intended candidates for the M.A. must present a minimum undergraduate preparation of 27 credits in mathematics, including analytic geometry and differential and integral calculus. College physics is also required. One
or more of the following courses are recommended but not required: differential equations, advanced calculus, theory of equations, vector analysis, statistics, and logic.

Courses for the master's in Mathematics are to be selected from those listed below. Required courses are marked with an asterisk. A maximum of 12 hours may be elected from courses in logic, theoretical courses in mechanics, electricity and magnetism, atomic and nuclear physics, and electrical and mechanical engineering.

**MATHEMATICS**

401-402  Differential Equations (3-3)
410     Numerical Methods for Algebraic Equations (3)
411     Numerical Methods for Differential Equations (3)
421     Introduction to Modern Algebra (3)
422     Matrices and Theory of Equations (3)
*431-432 Advanced Calculus (3-3)
442     Vector Analysis (3)
444     Theory of Functions of a Complex Variable (3)
471     Probability (3)
472     Statistical Inference (3)
501     Theory of Sets and Metric Spaces (3)
601-602 Applied Mathematics (3-3)
611-612 Modern Algebra (3-3)
621-622 Topology (3-3)
631-632 Theory of Functions of a Real Variable (3-3)
644-645 Analytic Function Theory (3-3)
*650     Seminar (1)
*699     Directed Research (ar.)
*800     Thesis Research (ar.)

**Meteorology**

**GRADUATE FACULTY**

M. A. Estoque, Ph.D. (Chairman)—numerical analysis and prediction, atmospheric boundary layer phenomena

W. C. Chiu, Ph.D.—stratospheric meteorology, large scale atmospheric turbulence, atmospheric oscillations

C. S. Ramage, Ph.D.—tropical meteorology

**AFFILIATE FACULTY**

P. C. Ekern, Ph.D.—agricultural meteorology

S. Price, B.S.—physical meteorology

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 prep-
aration 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 School, candidates for the M.S. must pass a comprehensive examination in the field.

Courses available for graduate credit are listed below. Courses may also be allowed in the fields of Oceanography, Physics, and Mathematics.

**METEOROLOGY AND OCEANOGRAPHY**
- 422 Introduction to Theoretical Meteorology I (4)
- 423 Introduction to Theoretical Meteorology II (4)
- 425 Tropical Meteorology (3)
- 430 Meteorological Analysis Laboratory (5)
- 575 Advanced Tropical Meteorology (6)
- 624 Atmospheric Turbulence (3)
- 673 Cloud Physics (3)
- 674 Physical Meteorology (3)
- 675 Numerical Analysis and Prediction (5)
- 676 Statistical Meteorology (3)
- 680 Advanced Theoretical Meteorology I (3)
- 681 Advanced Theoretical Meteorology II (3)
- 682 Special Topics in Meteorology (3)
- 683 Advanced Topics in Synoptic Meteorology I (3)
- 684 Advanced Topics in Synoptic Meteorology II (3)
- 685 Seminar I (1)
- 686 Seminar II (1)
- 687 Problems in Tropical Meteorology (2)
- 699 Directed Research (ar.)
- 800 Thesis Research (ar.)

**Microbiology**

**GRADUATE FACULTY**
- O. A. Bushnell, Ph.D. (Chairman)—medical and economic bacteriology
- A. A. Benedict, Ph.D.—immunology
- L. R. Berger, Ph.D.—general bacteriology and physiology
- G. W. Chu, D.Sc.—medical bacteriology and parasitology
- D. E. Contois, Ph.D.—general bacteriology and physiology
- P. C. Loh, Ph.D.—virology

**AFFILIATE FACULTY**
- E. J. Anderson, Ph.D.—nematology
- H. Klemmer, Ph.D.—economic bacteriology
- K. Wilcox, Ph.D.—medical bacteriology
- P. Yoder, Ph.D.—virology

Intended candidates for the M.S. or Ph.D. in Microbiology must present a minimum of 18 hours of undergraduate work in microbiology, basic courses in biology, botany, or zoology, and courses in general chemistry, organic
chemistry, 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, Public Health, Soil Science, and Zoology. Required courses are marked with an asterisk.

**Microbiology**

415  Descriptive Bacteriology (3)
620  Advanced General Bacteriology (3)
625  Immunology (3)
627  Techniques of Immunology (3)
631  Microbial Physiology (3)
632  Techniques of Microbial Physiology (3)
655  Virology (2)
657  Virology Laboratory (2)
*690  Seminar (1)
*699  Directed Research (ar.)
800  Thesis Research (ar.)

**Music**

**GRADUATE FACULTY**

N. D. Kian, Ed.D. (Chairman)—music education
M. Kerr, M.M.—music performance, piano
A. Russell, D.M.A.—music composition
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. For concentration in music education a record of teaching experience should be presented.

The M.A. in Music is offered with concentration in ethnomusicology, in musicology, and in music education. The M.F.A. in Music is offered with concentration in composition and in performance. Normally a maximum of 6 credit hours may be selected from advanced courses in other disciplines closely related to the field of thesis research as determined by the supervising committee. 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.

Candidates concentrating in music education may choose between the thesis program and the nonthesis program which normally includes 12 credit hours in education and music education, 18 credit hours in music, and 6 credit hours in related courses advised by the supervising committee. Require-
ments 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. A limited number of credit hours may be selected from advanced courses in Anthropology, Drama, Education, literature in English, Asian, Pacific or European languages, Philosophy, Psychology, Sociology, or other pertinent fields. A seminar in the field of concentration is required of all candidates.

**MUSIC**

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<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>400</td>
<td>Concert Choir (1–1)</td>
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<tr>
<td>401</td>
<td>Ensemble Music (1)</td>
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<tr>
<td>409</td>
<td>Concert Band (1)</td>
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<tr>
<td>435</td>
<td>Individual Instruction (ar.)</td>
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<tr>
<td>451</td>
<td>Advanced String Methods (2)</td>
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<tr>
<td>452</td>
<td>Advanced Woodwind Methods (2)</td>
</tr>
<tr>
<td>453</td>
<td>Advanced Brass Methods (2)</td>
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<tr>
<td>†461</td>
<td>Music of the Baroque Period (2)</td>
</tr>
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<td>†462</td>
<td>Music of the Classic Period (2)</td>
</tr>
<tr>
<td>†463</td>
<td>Music of the Romantic Period (2)</td>
</tr>
<tr>
<td>†464</td>
<td>Contemporary Music (2)</td>
</tr>
<tr>
<td>470</td>
<td>Music of Asia (3)</td>
</tr>
<tr>
<td>471</td>
<td>Music of Nonliterate Peoples (3)</td>
</tr>
<tr>
<td>481</td>
<td>Advanced Orchestration (2)</td>
</tr>
<tr>
<td>*483</td>
<td>Counterpoint (2)</td>
</tr>
<tr>
<td>484</td>
<td>Counterpoint (2)</td>
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<tr>
<td>485-486</td>
<td>Form and Analysis (2–2)</td>
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<tr>
<td>*487</td>
<td>Composition (2)</td>
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<tr>
<td>488</td>
<td>Composition (2)</td>
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<tr>
<td>600</td>
<td>Seminar (3)</td>
</tr>
<tr>
<td>635</td>
<td>Advanced Individual Instruction (ar.)</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>Seminar in Music Education (2)</td>
</tr>
<tr>
<td>654</td>
<td>Pacific and Asian Music in Education (2)</td>
</tr>
<tr>
<td>657</td>
<td>Advanced Conducting (2)</td>
</tr>
<tr>
<td>661</td>
<td>Bibliography and Research Methods in Music (3)</td>
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<tr>
<td>699</td>
<td>Directed Research (ar.)</td>
</tr>
<tr>
<td>800</td>
<td>Thesis Research (ar.)</td>
</tr>
</tbody>
</table>

**Nutrition**

**GRADUATE FACULTY**

- D. M. Hilker, Ph.D. (Chairman)—carbohydrate metabolism, enzymology
- I. J. Lichton, Ph.D.—fluid handling, endocrinology
- B. R. Standal, Ph.D.—protein, lipid metabolism

*Graduate credit not available to candidates for a degree in composition.
†Graduate credit not available to candidates for a degree in musicology.
Intended candidates for the M.S. in Nutrition must present the following undergraduate preparation: general chemistry, qualitative analysis, quantitative analysis, organic chemistry, biology, general physics, college algebra, trigonometry, and an adequate preparation in nutrition. Courses for the graduate major are to be selected from those listed below. Additional graduate courses may be taken in Animal Science, Chemistry, Biochemistry, Food Science, Microbiology, Zoology, or other related fields.

**NUTRITION**

601-602  Human Nutrition (3–3)
621  Topics in Nutrition (2)
651  Dietary Studies (ar.)
652  Laboratory Methods in Nutrition (3)
699  Directed Research (ar.)
701  Seminar (1)
800  Thesis Research (ar.)

**Oceanography**

**GRADUATE FACULTY**

T. Laevastu, Ph.D.—sea-air interactions, oceanographic forecasting, fisheries oceanography

**AFFILIATE FACULTY**

R. Barkley, Ph.D.—descriptive and dynamic
G. R. Seckel, M.S.—physical, sea-air interactions

Intended candidates for the M.S. must have a thorough preparation in general physics, chemistry, and mathematics through calculus. A reading knowledge of a foreign language is required. In addition to the examinations prescribed by the Graduate School, candidates for the M.S. must pass a comprehensive examination in the field.

Courses available for graduate credit are listed below. Courses may also be taken in the fields of Meteorology, Physics, Mathematics, Chemistry, Botany, and Zoology.

**METEOROLOGY AND OCEANOGRAPHY**

550  General Oceanography (3)
575  Regional Oceanography (2)
600  Physical Oceanography (3)
601  Oceanographic Forecasting (2)
675  Oceanographic Instrumentation, Laboratory Research and Field Work (2–4)
684  Problems in Oceanography (ar.)
800  Thesis Research (ar.)
Overseas Operations Program

GRADUATE FACULTY
J. N. Stalker, Ph.D. (Chairman)—current Asian affairs
J. M. Allison, LL.B.—foreign affairs
W. N. McIntire, M.A.—political science

The Overseas Operations Program is an individual study plan leading to the M.A. It is designed to prepare selected graduate students for service in Asia with international organizations, agencies of the United States Government, and private institutions and industries which operate in the area.

In conjunction with the objectives of the program, courses of study are coordinated and utilized to better fit the student for his chosen profession. The program for the individual graduate student will be tailored to his needs. Asian language programs are particularly stressed, and the student must demonstrate a real proficiency in at least one of the Asian languages before the degree will be granted. Students will be expected to engage in intensive work connected with their individual specialties as these relate to Asia.

No thesis is required for the degree; however, the following basic requirements must be met by all students:

1) 36 semester hours, including an internship of 6 semester hours;
2) required seminars in Agriculture, Economics, History, Philosophy, and Political Science;
3) fluency in at least one Asian language;
4) oral and written comprehensive examinations.

Courses available for graduate credit are:

OVERSEAS OPERATIONS
601-602 Internship in Overseas Operations (6)
699 Selected Readings (3–3)

Pacific Islands Studies

FACULTY COMMITTEE
L. Mason, Ph.D. (Chairman) (Anthropology)
E. B. Carr, Ph.D. (Speech)
J. H. Cox, M.A. (Art)
B. B. Smith, M.M. (Music)
W. E. Vinacke, Ph.D. (Psychology)

The required undergraduate background is 18 hours of credit dealing with the Pacific Islands area in the following fields: anthropology, art, economics, geography, history, literature, music, political science, psychology, 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 field of interest. At least three departments, other than language, must be represented. In valid instances, courses relating to the Pacific Islands in certain fields such as Agriculture, Botany, Chemistry, Microbiology, Nutrition, and Zoology, may be substituted. Required courses are marked with an asterisk.

**ANTHROPOLOGY**
- 400 Hawaii (3)
- 600 Polynesia (3)
- 601 Micronesia (3)
- 699 Directed Research (ar.)
- 750 Seminar (in Oceania) (3)

**ECONOMICS**
- 419 Economic Development of Hawaii (3)
- 452 Public Finance in Hawaii (3)
- 699 Directed Research (ar.)

**ENGLISH**
- 585 Literature of the Pacific (3)
- 699 Directed Research (ar.)

**GEOGRAPHY**
- 561 Geography of Australia and New Zealand (2)
- 571 Geography of the Pacific Islands (3)
- 578 Geography of Hawaii (3)
- 580 Geography of the Tropics (3)
- 665 Seminar in Geography of the Pacific (3)
- 699 Directed Research (ar.)

**HISTORY**
- 439 Australia and New Zealand (3)
- 571 Pacific Exploration and Discovery to 1779 (3)
- 572 Pacific Islands from 1779 (3)
- 575 The United States in the Pacific (3)
- 577 History of the Hawaiian Islands (3)
- 675 Seminar in Pacific History (3)
- 699 Directed Research (ar.)

**MUSIC**
- 471 Music of Pre-literate Peoples (3)
- 654 Pacific and Asian Music in Education (2)
- 699 Directed Research (ar.)

**PACIFIC ISLANDS**
- *699 Directed Research (ar.)
- *800 Thesis Research (ar.)

**POLITICAL SCIENCE**
- 422 Government of Hawaii (3)
Directed Research (ar.)

**PSYCHOLOGY**

- 660 Personality (3)
- 662 Social Psychology (3)
- 699 Directed Research (ar.)

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**Philosophy**

**GRADUATE FACULTY**

- W. E. Nagley, Ph.D. (Chairman)—history of Western religious philosophy, existential philosophy
- A. J. Gimigliano, Ph.D.—social and political, dialectical and historical materialism
- R. P. Haynes, Ph.D.—history and theory of Greek philosophy, western
- K. K. Inada, Ph.D.—history and theory of Buddhist philosophy, Asian thought
- H. E. McCarthy, Ph.D.—history and theory, metaphysics, philosophy of art
- C. A. Moore, Ph.D.—Oriental and East-West philosophy
- 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. Degree candidates are to be oriented in the same manner. (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.

**PHILOSOPHY**

**Western**

- 410 American Philosophy (3)
- 432 Symbolic Logic (3)
- 435 British Empiricism (3)
- 436 Continental Rationalism (3)
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<th>Course Code</th>
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<td>440</td>
<td>Political Philosophy</td>
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<td>475</td>
<td>Plato</td>
<td>(3)</td>
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<td>476</td>
<td>Aristotle</td>
<td>(3)</td>
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<tr>
<td>500</td>
<td>Philosophy of Art</td>
<td>(3)</td>
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<tr>
<td>505</td>
<td>Philosophy of Religion</td>
<td>(3)</td>
</tr>
<tr>
<td>510</td>
<td>Philosophy in Literature</td>
<td>(3)</td>
</tr>
<tr>
<td>515</td>
<td>Philosophy of History</td>
<td>(3)</td>
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<td>520</td>
<td>Existential Philosophy</td>
<td>(3)</td>
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<td>550</td>
<td>Theory of Science</td>
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<td>555</td>
<td>Foundations of Science</td>
<td>(3)</td>
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<td>600</td>
<td>Seminar in Problems of Philosophy</td>
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<td>Seminar in Greek Philosophy</td>
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<td>610</td>
<td>Seminar in Modern Philosophy</td>
<td>(3)</td>
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<td>Seminar in Contemporary Philosophy</td>
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**Eastern**

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<tr>
<td>445</td>
<td>Philosophical Foundations of Indian Culture</td>
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<tr>
<td>450</td>
<td>Introduction to Indian Philosophy</td>
<td>(2)</td>
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<tr>
<td>451</td>
<td>Contemporary Indian Philosophy</td>
<td>(3)</td>
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<tr>
<td>453</td>
<td>Indian Social Philosophy</td>
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<tr>
<td>460</td>
<td>Introduction to Buddhist Philosophy</td>
<td>(3)</td>
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<td>461</td>
<td>Theravada Buddhist Philosophy</td>
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<td>462</td>
<td>Mahayana Buddhist Philosophy</td>
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<td>464</td>
<td>Zen Buddhist Philosophy</td>
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<td>470</td>
<td>Introduction to Chinese Philosophy</td>
<td>(3)</td>
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<td>471</td>
<td>Confucianism</td>
<td>(3)</td>
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<td>650</td>
<td>Seminar in Indian Philosophy</td>
<td>(3)</td>
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**Comparative**

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

**Physics**

**Graduate Faculty**

K. Watanabe, Ph.D. (Chairman)—spectroscopy, space physics
J. C. Kudar, Ph.D.—theoretical physics
H. C. McAllister, Ph.D.—optics, spectroscopy, space physics
I. Miyake, M.S.—acoustics, electronics
V. Peterson, Ph.D.—nuclear physics
W. Pong, Ph.D.—solid state physics
W. R. Steiger, Ph.D.—optics, atmospheric and solar physics
Intended candidates for the M.S. or Ph.D. must present a minimum of 35 semester hours of undergraduate credit 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.

Courses available for graduate credit are listed below. Required courses are marked with an asterisk. Additional courses may be selected, with approval, in Mathematics, Chemistry, Meteorology, engineering, and Philosophy.

**PHYSICS**

400 Nuclear Science Laboratory (2)
420 Sound (3)
440 Physical Electronics (3)
461 Optics Laboratory (1)
*610 Analytical Mechanics I (3)
611 Analytical Mechanics II (3)
620 Physics of the Upper Atmosphere (3)
630 Statistical Mechanics (3)
*650 Electrodynamics I (3)
651 Electrodynamics II (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 (ar.)
*800 Thesis (ar.)

**Plant Pathology**

**GRADUATE FACULTY**
M. Ishii, Ph.D. (Chairman)—virology, diseases of vegetable crops
S. Goto, Ph.D.—epidemiology diseases of ornamentals
R. B. Hine, Ph.D.—soil-borne fungal diseases
O. V. Holtzmann, Ph.D.—parasitic nematodes, diseases of fruits and nuts

**AFFILIATE FACULTY**
E. J. Anderson, Ph.D.—soil-borne fungal and nematode diseases
H. W. Klemmer, Ph.D.—soil microbiology
J. D. Radewald, Ph.D.—nematology
C. H. Spiegelberg, Ph.D.—fruit diseases of pineapple
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 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 graduate credit 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**

- 610 Principles of Plant Disease Control (3)
- 620 Plant Pathology Techniques (3)
- 625 Advanced Plant Pathology (2)
- *660 Plant Pathology Seminar (1)
- 699 Directed Research (ar.)
- *800 Thesis Research (ar.)

**Political Science**

*(Government)*

**GRADUATE FACULTY**

- R. H. Kosaki, Ph.D. (Chairman)—political theory, politics
- R. S. Cahill, Ph.D.—politics, American government
- H. J. Friedman, Ph.D.—public administration, comparative
- W. Levi, Ph.D.—international relations, comparative
- N. Meller, Ph.D.—public administration, public law
- R. M. Miwa, Ph.D.—political theory, international relations (on leave)
- C. B. Neff, Ph.D.—international relations, comparative
- D. J. Palumbo, Ph.D.—American government, public law
- A. F. Saunders, Ph.D.—political theory, American government
- E. F. Spellacy, Ph.D.—public law, American government
- R. B. Stauffer, Ph.D.—comparative government, international relations (on leave)
- E. O. Stene, Ph.D.—public administration (visiting professor, 2nd semester)
- W. G. Thrombley, Ph.D.—public administration, American government
- D. W. Tuttle, M.A.—politics, American government
- P. W. J. van der Veur, Ph.D.—international relations, comparative
Intended candidates for the M.A. and Ph.D. must present a minimum of 18 hours of undergraduate credit in political science.

Candidates for the master's degree are required to pass a written examination in at least three of the subfields indicated below. Doctoral candidates are required to pass a written comprehensive examination in at least five of the subfields in political science.

In addition to courses in political science, candidates shall take courses in other fields, e.g., Anthropology, Economics, History, Philosophy, Psychology, or Sociology, as determined by the supervising committee.

Courses available for graduate credit in the department are listed below. All candidates for graduate degrees are required to take Government 600.

**GOVERNMENT**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>404</td>
<td>Modern Political Ideologies (3)</td>
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<td>405</td>
<td>American Political Thought (3)</td>
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<tr>
<td>*600</td>
<td>Contemporary Political Science (3)</td>
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<td>602</td>
<td>Asian Political Thought (3)</td>
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<tr>
<td>700</td>
<td>Seminar: Classical Western Political Thought (3)</td>
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<td>701</td>
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**Political Theory**

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<tr>
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<tr>
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<td>State Government and Administration (3)</td>
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<tr>
<td>421</td>
<td>Municipal Government and Administration (3)</td>
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<tr>
<td>422</td>
<td>Government of Hawaii (3)</td>
</tr>
<tr>
<td>720</td>
<td>Seminar: American National Government (3)</td>
</tr>
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<td>721</td>
<td>Seminar: State and Local Government (3)</td>
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**American Government**

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<th>Course</th>
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<td>443</td>
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<tr>
<td>444</td>
<td>Government and Politics of South and Southeast Asia (3)</td>
</tr>
<tr>
<td>446</td>
<td>Government and Politics of the USSR (3)</td>
</tr>
<tr>
<td>640</td>
<td>Politics of National Development (3)</td>
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<tr>
<td>740</td>
<td>Seminar: Far Eastern Politics (3)</td>
</tr>
<tr>
<td>741</td>
<td>Seminar: South and Southeast Asia (3)</td>
</tr>
<tr>
<td>742</td>
<td>Seminar: Comparative Politics (3)</td>
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**Comparative Government**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>461</td>
<td>American Foreign Policy (3)</td>
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<tr>
<td>462</td>
<td>International Relations of the Far East (3)</td>
</tr>
<tr>
<td>463</td>
<td>International Relations of South and Southeast Asia (3)</td>
</tr>
<tr>
<td>466</td>
<td>Soviet Foreign Policy (3)</td>
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<tr>
<td>631</td>
<td>American Foreign Service (3)</td>
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<tr>
<td>632</td>
<td>Government Agencies Overseas (3)</td>
</tr>
<tr>
<td>760</td>
<td>Seminar: International Politics (3)</td>
</tr>
<tr>
<td>761</td>
<td>Seminar: International Organization (3)</td>
</tr>
</tbody>
</table>

69
Politics
481 American Political Parties (3)
483 Propaganda and Public Opinion (3)
680 Political Behavior (2)
681 Public Policy Development (3)
780 Seminar: Politics (3)
781 Seminar: Legislative Process (3)

Public Administration
500 Public Administration (3)
501 Principles of Management (3)
502 Personnel Administration (3)
651 Development Administration (3)
655 Technology of Public Administration (3)
656 Regional and City Planning (3)
750 Seminar: Public Administration (3)
751 Seminar: Comparative Public Administration (3)

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

General
699 Directed Research (ar.)
800 Thesis Research (ar.)

Special Program in Public Administration
A special program leading to the master's degree in Political Science in the field of public administration is available under plan B. A written examination in the several subfields of public administration must be passed in the semester prior to completion of the program.

No fixed curriculum is prescribed for students working for this degree. The eight courses in public administration listed below, however, are basic to the program and all students are required to have completed them or their equivalent. If any or all of the 500-numbered courses have been taken at the undergraduate level they need not be repeated, but they may not be used to satisfy the 36-hour requirement for the graduate degree. Basic courses in Public Administration are listed below:

GOVERNMENT
500 Public Administration (3)
501 Principles of Management (3)
502 Personnel Administration (3)
651 Seminar in Comparative Public Administration (3)
655 Technology of Public Administration (3)
Additional courses for the program shall be selected in consultation with the Program Committee. The department will furnish candidates in this program with additional information, including a list of recommended courses in other subfields and disciplines.

Poultry Science

GRADUATE FACULTY
E. Ross, Ph.D. (Chairman)—nutrition
R. B. Herrick, Ph.D.—physiology
S. L. McHenry, Ed.D.—housing management
A. L. Palafox, M.S.—nutrition
M. M. Rosenberg, Ph.D.—poultry genetics

Intended candidates for the M.S. must present 18 semester hours of undergraduate credit in poultry science and related fields. The related subject matter fields are animal science, bacteriology, chemistry, and zoology. Courses are to be selected from those listed below and others in the Fields of Study of Agricultural Economics, Animal Science, Biochemistry, Chemistry, Entomology, Genetics, Microbiology, Nutrition, and Zoology.

Candidates may specialize in the areas of poultry nutrition, physiology, breeding, or management. However, due to limited facilities, programs restricted in scope are offered in breeding and management.

POULTRY SCIENCE
473 Poultry Breeding (3)
474 Poultry Nutrition (3)
475 Incubation and Hatchery Management (3)
601 Seminar in Poultry Science (1)
800 Thesis Research (ar.)

Psychology

GRADUATE FACULTY
W. E. Vinacke, Ph.D. (Chairman)—small groups; motivation
A. Arkoff, Ph.D.—clinical
H. M. Bitner, Ph.D.—student counselling
D. H. Crowell, Ph.D.—infant responsiveness; exceptional children
A. L. Diamond, Ph.D.—psychophysics
J. M. Digman, Ph.D.—measurement; child personality
A. A. Dole, Ph.D.—individual differences; counselling; rehabilitation
C. J. Herrick, Ph.D.—student counselling; history of psychology
Intended candidates for the 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. degree is offered in all traditional fields with special facilities available for social, developmental, industrial, counselling, and psychophysics. Candidates for the M.A. in counselling are expected to meet the standards set by the American Psychological Association including 48 semester credits. A special program in vocational rehabilitation counselling is available.

At least one from each of the following pairs of courses is required: 614-615; 620-621; and 630-631.

The Ph.D. is offered with specialization in the following fields: general-experimental, social-personality, developmental and counselling psychology. Candidates may, under special circumstances, offer 30 course credits in lieu of the M.A. degree. Additional details of programs are presented in a brochure available from the department.

**Psychology**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>410</td>
<td>History of Psychology</td>
<td>(3)</td>
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<tr>
<td>430</td>
<td>Intermediate Experimental Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>440</td>
<td>Physiological Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>450</td>
<td>Social Development of Children</td>
<td>(3)</td>
</tr>
<tr>
<td>468</td>
<td>Political Psychology</td>
<td>(2)</td>
</tr>
<tr>
<td>480</td>
<td>Abnormal Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>515</td>
<td>Comparative Psychology</td>
<td>(3)</td>
</tr>
<tr>
<td>574</td>
<td>Problems in Industrial and Business Psychology</td>
<td>(3)</td>
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<tr>
<td>600</td>
<td>Seminar: Problems in Psychology</td>
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<td>615</td>
<td>Theory II</td>
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<td>620</td>
<td>Quantitative Methods I</td>
<td>(3)</td>
</tr>
<tr>
<td>621</td>
<td>Quantitative Methods II</td>
<td>(3)</td>
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</table>
Public Health

GRADUATE FACULTY
R. K. C. Lee, M.D., Dr.P.H. (Chairman)—public health administration
E. D. Lovett, M.D.—school health programs
B. J. McMorrow, M.S.—sanitary engineering
D. W. Ryckman, Sc.D.—environmental health
G. Schnack, M.D.—mental health
F. Shepard, M.D.—medical disability
G. Tokuyama, M.P.H.—biostatistics
R. Worth, M.D., Ph.D.—epidemiology

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

Intended candidates for the M.S. in Public Health will follow plan B. Six courses (marked with an asterisk) which present the basic concepts of public health and two seminars are required of all candidates.

Ordinarily, a minimum of two full academic years will be needed to complete the program. Students who have had little or no practical experience in public health must spend one summer session in laboratory or field work, or in some other form of on-the-job training.

Courses are to be selected from those listed below, and, with approval, the related fields of Microbiology, Education, Engineering, Nursing, Psychol-
ogy, Sociology, Biology, Genetics, and Anthropology.

PUBLIC HEALTH

*601-602  Principles and Practices of Public Health (3–3)
*610     Infectious Diseases of Man in the Pacific Area (3)
*625     Biostatistics (3)
626     Vital Statistics (3)
630     Public Health Nutrition (2)
636-637  Environmental Health (2–2)
640     Public Health Education (2)
*651     Epidemiology and Epidemiography of the Pacific Area (3)
660-661  Community Mental Health (2–2)
670     Medical Aspects of Disability (3)
*675     Effect of the Environment on Personal Health (3)
690     Seminar on Community Health Problems (1)
691     Seminar on International Health (1)
692     Seminar on School Health Services (1)
699     Directed Research (ar.)
*710     Public Health Administration (3)

Social Work

GRADUATE FACULTY

K. N. Handley, M.S.W. (Director)—social services
E. H. Cochran, M.A.—social services and casework
H. A. Jambor, M.A.—social services, community organization
F. C. Merritt, M.S.W.—casework
R. Takasaki, M.P.A., administration
W. A. Walsh, M.A.—casework, human growth and behavior
A. B. Zaloha, M.A.—group work

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 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 WORK

Social Services

624     History of Social Work (2)
Child Welfare (2)
Public Welfare in the U. S. (2)
Legal Aspects of Social Work (2)
Social Welfare Organization and Administration (2)
Seminar in Social Welfare Policy (2)

Human Growth and Behavior
Human Growth and Behavior (3-3)
Advanced Social Psychiatry (2)
Cultural Factors in Social Work Practice (2)

Social Work Methods
Social Casework (2-2), or
Social Group Work (2-2)
Group Work Program Activities (1-1)
Community Organization (2)
Supervised Field Work (3-3)
Advanced Supervised Field Work (4-4)
Advanced Social Casework (2-2), or
Advanced Social Group Work (2-2)
Community Development in Social Work (2)

Research
Social Statistics and Research (2)
Seminar in Research (3-3)
Thesis Research

Sociology
C. K. Cheng, Ph.D. (Chairman)—social institutions, criminology and penology
O. Bartos, Ph.D.—theory, small groups
C. E. Glick, Ph.D.—race relations, collective behavior
B. L. Hormann, Ph.D.—modernization of peasant peoples, social disorganization
I. Krauss, Ph.D.—social stratification, urban sociology
A. W. Lind, Ph.D.—the community, emphasis on race relations
T. T. Wittermans, Ph.D.—social change in developing areas
G. K. Yamamoto, M.A.—race and ethnic relations
D. S. Yamamura, Ph.D.—methods and statistics, demography and ecology

Intended candidates for the M.A. must present a minimum undergraduate preparation of 18 credits in sociology, including the equivalent of Introduction to the Study of Society (151) or Principles of Sociology (201).
Courses available for graduate credit are listed below. A maximum of 6 hours 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)
418 Human Migration (3)
420 Human Ecology (3)
434 American Rural Community (3)
436 The Urban Community (3)
440 Folk and Peasant Society (3)
444 People and Institutions of China (3)
446 People and Institutions of Japan (3)
450 Race and Culture Contacts in Hawaii (3)
452 Race Relations in the Pacific (3)
458 Race Relations (3)
462 American Society (3)
464 Social Institutions (3)
472 The Family (3)
480 Sociology of Religion (3)
486 Industrial Sociology (3)
500 Social Disorganization (3)
504 Juvenile Delinquency (3)
506 Criminology (3)
520 Social Control (3)
524 Personality and Culture (3)
530 Sociology of Small Groups (3)
540 Collective Behavior (3)
542 Social Movements (3)
544 Social Change (3)
546 Public Opinion and the Community (3)
560 Methods of Social Research (3)
570 Social Statistics (3)
572 Advanced Social Statistics (3)
580 Sociological Theory (3)
602 Graduate Seminar (3)
  (1) Human Ecology and Demography
  (2) Social Organization
  (3) Social Disorganization
  (4) The Group and the Person
  (5) Collective Behavior and Social Change
628 Seminar in Race Relations (3)
652 Seminar in Social Change in Developing Areas (3)
654 Seminar in Community Development (3)
GRADUATE FACULTY

G. D. Sherman, Ph.D. (Chairman)—soil genesis and weathering, classification, chemistry, fertility
R. L. Fox, Ph.D.—soil fertility and chemistry
D. G. Moore, Ph.D.—soil chemistry, biotics, soil-plant relationships
Y. Kanehiro, M.S.—soil chemistry, fertility
G. Uehara, Ph.D.—soil physics, mineralogy, physical chemistry, genesis
O. R. Younge, Ph.D.—soil management, fertility

AFFILIATE FACULTY

A. S. Ayres, Ph.D.—soil chemistry
L. D. Baver, Ph.D.—soil physics
P. C. Ekern, Ph.D.—soil physics
D. H. Smith, Ph.D.—soil fertility and chemistry
G. Stanford, Ph.D.—soil fertility and chemistry

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).

Ph.D. candidates may be required to spend a year (24 semester hours) of course work on the graduate level in a Mainland institution with a strong department of soil science.

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 management, weathering of soils, and the fundamental physical and chemical properties of soils.

SOIL SCIENCE

484 Soil Physics (3)
485 Soil Biotics (3)
*685 Soil Genesis and Formation (3)
686 Advanced Soil Classification (3)
GRADUATE FACULTY

E. B. Carr, Ph.D. (Chairman)—phonetics and phonemics, research methods
M. Ansberry, Ph.D.—speech correction and audiology
L. F. Bentley, M.A.—voice and drama
E. J. Bilsborrow, Ph.D.—public speaking, speech education
L. N. Breneman, M.A.—speech education, speech improvement
M. J. Gordon, M.A.—phonetics, speech education
J. P. Hoshor, Ph.D.—leadership and discussion, semantics
D. W. Klopf, Ph.D.—forensics and debate
V. G. Larson, M.A.—speech education, speech improvement
O. S. Lefforge, Ph.D.—rhetoric and public address
J. R. L. Linn, M.A.—interpretation
L. R. Newcomer, M.A.—public address, speech education, rhetoric
E. G. Ritter, Ph.D.—speech pathology
A. J. Schutz, Ph.D.—phonetics, phonemics, speech for foreign students
J. H. Sloan, Ph.D.—rhetoric, public address, debate
J. F. Smith, M.A.—interpretation, semantics, speech education
H. H. Wong, Ph.D.—phonetics, speech education

Intended candidates for the M.A. must present a minimum of 27 semester hours of undergraduate credit in speech selected from the following areas: general speech education, speech correction, phonetics and speech science, interpretation, forensics and public address, radio, pedagogy, audiology, and oral English for the foreign student.

Courses available for graduate credit are listed below. Required courses are indicated by an asterisk. In addition, candidates may be required to demonstrate a satisfactory level of speech skill in a platform appearance before a faculty committee.
Teaching of English as a Second Language

Graduate Faculty

F. Cammack, Ph.D.—linguistics
E. B. Carr, Ph.D.—phonetics and phonemics
S. H. Elbert, Ph.D.—linguistics
Y. Shen, Ph.D.—linguistics
A. J. Shutz, Ph.D.—linguistics
T. L. Summersgill, Ph.D.—English literature

The Master of Arts in the Teaching of English as a Second Language is an interdepartmental graduate program contributed to by the departments of Anthropology, English, and Speech. This program is available to both foreign and native graduate students, and is a 36-semester hour, nonthesis program with major emphasis on linguistics and linguistic methods of teaching English. Competence in understanding, speaking, reading and writing
English is prerequisite, and for foreign students must be certified by English language experts in the student's own country at the time of application for admission. Native students are required to pursue competence in the language and culture of their chosen area of teaching English as a second language. The MATESL curriculum for foreign students follows. Native students may be exempted from starred courses, which will be replaced by language and culture courses of their chosen area.

AMERICAN STUDIES
690 Contemporary American Civilization (3)

ANTHROPOLOGY
620 Introduction to Linguistics (3)
621 Phonemics (3)
622 Linguistic Morphology (3)

ENGLISH
425 Modern English Grammar (3)
*601 Teaching of English Composition (3)
*602 Teaching of English Literature (3)
622 Teaching English as a Second Language (3)
625 History of English the Language (3)
722 Apprentice Teaching (6)

SPEECH
615 Phonetics and Phonemics of American English (3)
*616 Special Problems in Phonetics and Phonemics (3)

Zoology

GRADUATE FACULTY
A. L. Tester, Ph.D. (Chairman)—fishery biology, biometry, behavior
J. E. Alicata, Ph.D.—parasitology
A. H. Banner, Ph.D.—invertebrate zoology, systematics
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. Hsiao, 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
E. S. Reese, Ph.D.—behavior, ecology, invertebrate zoology
S. J. Townsley, Ph.D.—invertebrate zoology, ecology, radiobiology
P. B. van Weel, Ph.D.—physiology, physiological ecology
**AFFILIATE FACULTY**

- Y. Kondo, Ph.D.—malacology
- J. J. Magnuson, Ph.D.—population dynamics, fish behavior
- J. C. Marr, M.A.—fishery biology, population dynamics
- D. W. Strasburg, Ph.D.—ichthyology
- M. Takata, M.S.—fishery biology

Intended candidates for the M.S. or Ph.D. in Zoology (marine aspects in the latter case) 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.

Courses available for graduate credit are listed below. One seminar each year is required. Other required courses are marked with an asterisk. 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. Under plan B a minimum of 2 credits of directed research is required. For the Ph.D., additional work will be stipulated by the supervising committee.

### ZOOLOGY

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>401</td>
<td>Introduction to Ecology</td>
<td>2</td>
</tr>
<tr>
<td>410</td>
<td>Parasitology</td>
<td>3</td>
</tr>
<tr>
<td>416</td>
<td>Histology</td>
<td>3</td>
</tr>
<tr>
<td>425</td>
<td>Microtechnique</td>
<td>3</td>
</tr>
<tr>
<td>431</td>
<td>Biometry</td>
<td>3</td>
</tr>
<tr>
<td>432</td>
<td>Advanced Biometry</td>
<td>3</td>
</tr>
<tr>
<td>441</td>
<td>History of Zoology</td>
<td>2</td>
</tr>
<tr>
<td>504</td>
<td>Animal Evolution</td>
<td>2</td>
</tr>
<tr>
<td>505</td>
<td>Endocrinology</td>
<td>2</td>
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<tr>
<td>525-526</td>
<td>General Ichthyology</td>
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<td>Zoological Literature</td>
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<td>*602</td>
<td>Preparation of Scientific Manuscripts</td>
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<td>603</td>
<td>Zoogeography</td>
<td>2</td>
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<tr>
<td>606</td>
<td>Comparative Animal Behavior</td>
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646 Comparative Invertebrate Physiology (3)  
691 Seminar in Marine Zoology (1)  
692 Seminar in Fisheries Biology (1)  
699 Directed Research (ar.)  
732 Fisheries Management (3)  
*800 Thesis Research (ar.)

Other Faculty

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